

# POORNIMA UNIVERSITY, JAIPUR

## BCA First Year

### Teaching Scheme for First Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCA01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCA01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCA01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCA01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BCA01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCA01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCA01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCA01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCA01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCA01611.3	Online Certification Courses	-	-	-	-	-	-			
	Total	20	1	14				25.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA First Year

### Teaching Scheme for Second Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCA02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCA02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCA02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCA02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCA02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCA02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCA02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BCA02610.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	16				23.5		
	Total Teaching Hours	35						23.5		

# POORNIMA UNIVERSITY, JAIPUR

## BCA Second Year

### Teaching Scheme for Third Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA03101	Advanced Java Programming	4	-	-	40	60	100	4	Theory	Core Course
BCA03102	Database Management System	3	-	-	40	60	100	3	Theory	Core Course
BCA03103	Object Oriented Analysis & Design	3	-	-	40	60	100	3	Theory	Core Course
BCA03204	Advance Java Programming Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA03205	Database Management System Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA03106.1	Information Security Fundamentals	3	-	-	40	60	100	3	Theory	Departmental Elective: ANYONE
BCA03106.2	C# Programing				40	60	100		Theory	
BSE03151	Fundamentals of IoT and its Applications	3	-	-	40	60	100	3	Theory	Open Elective (School Level) ANYONE
BSE03152	Introduction to Animation and Photography				40	60	100		Theory	
BSE03153	Python Programming				40	60	100		Theory	
BSE03154	Blockchain Fundamentals				40	60	100		Theory	
BSE03155	Big Data Analytics				40	60	100		Theory	
BSE03156	Introduction to Digital Marketing				40	60	100		Theory	
BCA03313	Summer Project	-	-	2	60	40	100	1	Practical	Ability Enhancement compulsory course
BCA03414	Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement compulsory course
BCA03215	Personality Development	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA03216	Life & Career Skills-II	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA03617	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA03617.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BCA03617.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCA03617.3	Online Certification Courses	-	-	-	-	-	-			
	Total	18	0	17				24.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA Second Year

### Teaching Scheme for Fourth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA04101	Interactive Web Application Development	3	-	-	40	60	100	3	Theory	Core Course
BCA04102	Server Side Scripting	4	-	-	40	60	100	4	Theory	Core Course
BCA04103	Software Engineering	3	-	-	40	60	100	3	Theory	Core Course
BCA04204	Interactive Web Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA04205	Server Side Scripting Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA04106.1	GUI Programming with .Net	3	-	-	40	60	100	3	Theory	Departmental Elective: ANYONE
BCA04106.2	Big Data Fundamentals				40	60	100		Theory	
	Annexure 1	3	-	-	40	60	100	3	Theory	Open Elective (University Level) ANYONE
BCA04307	Industrial Training Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement compulsory course
BCA04208	Logical Reasoning and Thinking	-	-	2	40	60	100	1	Practical	Skill Enhancement Course
BCA04209	Life & Career Skills-III	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA04610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA04610.1	Campus Recruitment Training/OLE	3	-	-	-	-	-			
BCA04610.2	Non Syllabus Project (NSP)	-	-	-	-	-	-			
BCA04610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>14</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>33</b>								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA Third Year

### Teaching Scheme for Fifth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA05101	Mobile Application Development	3	-	-	40	60	100	3	Theory	Core Course
BCA05102	PHP and Perl Programming	3	-	-	40	60	100	3	Theory	Core Course
BCA05103	User Interface Design	3	-	-	40	60	100	3	Theory	Core Course
BCA05104	Asp.NET	3	-	-	40	60	100	3	Theory	Core Course
BCA05205	Mobile Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA05206	PHP and Perl Programming Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA05207	Asp.NET Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA05108.1	Artificial Intelligence	3	-	-	40	60	100	3	Theory	Departmental Elective: ANYONE
BCA05108.2	Cloud Technology				40	60	100		Theory	
BCA05209	Life & Career Skills-IV	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA05210	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA05210.1	Campus Recruitment Training/OLE	3	-	-	-	-	-			
BCA05210.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCA05210.3	Online Certification Courses	-	-	-	-	-	-			
	Total	18	0	15				22.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA Third Year

### Teaching Scheme for Sixth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA06301	Major Project / Internship	-	-	12	60	40	100	12	Practical	Ability Enhancement Compulsory Course
BCA06602	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	-	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA06602.1	Campus Recruitment Training/OLE	-	-	-	-	-	-	-		
BCA06602.2	Non Syllabus Project (NSP)	-	-	-	-	-	-	-		
BCA06602.3	Online Certification Courses	-	-	-	-	-	-	-		
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>12</b>				<b>12</b>		
	<b>Total Teaching Hours</b>	<b>12</b>								

Summary Sheet for Teaching Scheme (Credits)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Total Credits
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	13	4	-	-	6	1	-	1	0.5	25.5
II	13	6	-	-	3	-	-	1	0.5	23.5
III	10	4	3	3	-	2	-	2	0.5	24.5
IV	10	4	3	3	-	1	-	2	0.5	23.5
V	12	6	3	-	-	-	-	1	0.5	22.5
VI	-	-	-	-	-	12	-	-	-	12
Total	58	24	9	6	9	16	0	7	2.5	131.5

Summary Sheet for Teaching Scheme (Subjects)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Remarks
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	4	2	-	-	2	1	-	1	3	-
II	4	3	-	-	1	-	-	1	3	-
III	3	2	2	6	-	2	-	2	3	School Level Open Elective
IV	3	2	2	25		1	-	2	3	University Level Open Elective
V	4	3	2	-	-	-	-	1	3	-
VI	-	-	-	-	-	1	-	-	3	Internship for 6 months
Total	18	12	6	31	3	5	0	7	18	100

## Annexure - I

### Open Elective Courses at University Level in IV Semester (For All Schools)

Sr. No.	Course Code	Course Name	Teaching Department
1	BOE04111	Industrial Psychology and Sociology	Mechanical Engineering
2	BOE04112	Total Quality Management	Mechanical Engineering
3	BOE04113	Project Management	Mechanical Engineering
4	BOE04114	Logistics and Supply Chain Management	Mechanical Engineering
5	BOE04115	Basics of Petro Industry	Mechanical Engineering
6	BOE04116	Nano Science and Technology	Electrical & Electronics Engineering
7	BOE04117	Non Conventional Energy Sources	Electrical & Electronics Engineering
8	BOE04118	Introduction to Soft Computing	Electrical & Electronics Engineering
9	BOE04119	IPR and Patents	Electrical & Electronics Engineering
10	BOE04120	Artificial intelligence	Electrical & Electronics Engineering
11	BOE04121	E-commerce	Computer Engineering
12	BOE04122	Management Information System (MIS)	Computer Engineering
13	BOE04123	IT Act and Cyber Law	Computer Engineering
14	BOE04124	Python	Computer Engineering
15	BOE04125	Basics of UX/UI Design	Computer Engineering
16	BOE04126	Values and Professional Ethics	SMC
17	BOE04127	Digital Marketing	SMC
18	BOE04128	Business Research	SMC
19	BOE04129	Basics of Economics	SMC
20	BOE04130	Entrepreneurship	SMC
21	BOE04131	Essentials of Management	SMC
22	BOE04132	Organizational Behaviour & Cyber Law	SMC
23	BOE04133	Disaster Management	SPA
24	BOE04134	Foreign Language French & Japanese	SPA
25	BOE04135	Creative Thinking	SDA





**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE & ENGINEERING

# BCA

Batch 2019-22

# BCA



July 2019

Teaching Scheme for  
BCA - Detailed  
Syllabus for  
I & II SEM

POORNIMA UNIVERSITY, JAIPUR										
BCA First Year (2019-2022)										
Teaching Scheme for First Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCA01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCA01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCA01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCA01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BCA01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCA01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCA01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCA01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCA01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCA01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

POORNIMA UNIVERSITY, JAIPUR										
BCA First Year (2019-2022)										
Teaching Scheme for Second Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCA02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCA02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCA02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCA02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCA02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCA02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCA02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCA02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCA02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCA02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCA02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BCA02610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

# BCA

## Batch 2019-22

# BCA



## Teaching Syllabus for I Sem.

## CORE THEORY SUBJECTS

Code: BCA01101

PROGRAMMING FUNDAMENTALS USING C

3 Credits [LTP: 3-0-0]

### COURSE OUTCOME:

Even with the introduction of several high level languages and frameworks, the development of procedural codes is important in several commercial app developments. The object oriented platforms and event driven systems use procedural languages for coding integral command content.

C is an important procedural language and was developed initially to write the UNIX operating system. UNIX operating system, C compiler and all UNIX application programs are written in C. C is popular because, it is easy to learn, produces efficient programs, can handle low-level activities, and can be compiled on a variety of platforms.

This unit focuses on all the basic concepts, syntax and constructs of the C language. For students, who are new to programming, this unit can be considered as the starting point before taking up any other programming oriented units. The students will be implementing the concepts explained here to create simple to complex programs.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Overview of Programming	6
2.	Fundamentals of C programming	6
3.	Advanced programming techniques	8
4.	Dynamic data structures in C	8
5.	Additional features	8

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	Overview of Programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Introduction to computer based problem solving</b>, Program design and implementation issues- Flowcharts &amp; Algorithms, Top down design &amp; stepwise refinement</li><li><b>Programming environment</b> – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters.</li><li>Conclusion of the Unit</li></ul>
2.	Fundamentals of C programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Overview of C</b>, Data Types, Constants &amp; Variables, Operators &amp; Expressions</li><li><b>Control constructs</b>-if then, for, while, <b>Arrays</b>- single &amp; multidimensional arrays</li><li><b>Functions</b>-fundamentals – general form, function arguments, return value</li><li><b>Basic I/O</b>-formatted and Unformatted I/O, <b>Advanced features</b>- Type modifiers and storage class specifies for data types, Bit operators, Operator, &amp;operator, * operator, Type casting, type conversion.</li><li>Conclusion of the Unit</li></ul>
3.	Advanced programming techniques

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Control constructs</b>- Do while, Switch statement, break and continue, exit() function, go to and label</li> <li>• <b>Scope rules</b>- Local &amp; global variables, scope rules of functions</li> <li>• <b>Functions</b>-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi.</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Dynamic data structures in C</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Pointers</b>- The &amp; and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function returning pointers</li> <li>• <b>Structures</b>- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures</li> <li>• <b>Unions</b> – Declaration, uses, enumerated data-types, typedef.</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Additional features</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>File Handling</b> – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf</li> <li>• <b>C Preprocessor</b>- #define, #include, #undef, Conditional compilation directives.</li> <li>• <b>C standard library and header files</b>: Header files, string functions, mathematical functions, Date and Time functions.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Let us C, 6 <sup>th</sup> Edition	Yashwant Kanetka	PBP Publication
2.	The C programming Language	Richie and Kenninghan	BPB Publication,2004
3.	Programming in ANSI C 3 <sup>rd</sup> Edition, 2005	Balaguruswamy	Tata McGraw Hill



### COURSE OUTCOME:

- To understand and the use of basic concepts of Computer components.
- To understand the concept of memory hierarchy and the use of various input-output devices.
- To understand the various computer languages, operating system functions and the application of number systems.
- To understand the basic Computer Networking principles and the applications of WWW, multimedia and the usage of electronic mail.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Register Transfer and Micro-operation	8
2.	Basic Computer Organization	8
3.	Micro Programmed Control Unit	8
4.	Computer Arithmetic	6
5.	Modes of Data Transfer and Memory Organization	6

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Register Transfer and Micro-operation</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer.</li> <li>• Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor,</li> <li>• Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Basic Computer Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Instruction Codes, Computer Registers: Common bus system, Computer Instructions:</li> <li>• Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions.</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Micro Programmed Control Unit</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines.</li> <li>• Design of Control Unit, Central Processing Unit: Introduction, General Register Organization,</li> <li>• Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes.</li> <li>• Conclusion of Unit</li> </ul>
4.	<b>Computer Arithmetic</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Addition and Subtraction,</li> </ul>

	<ul style="list-style-type: none"> <li>• Multiplication Algorithms (Booth algorithm), Division Algorithms,</li> <li>• Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors.</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Modes of Data Transfer and Memory Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Modes of Data Transfer: Priority Interrupt, Direct Memory Access,</li> <li>• Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory,</li> <li>• Associative Memory, Cache Memory, Virtual Memory</li> <li>• Conclusion of unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Computer System Architecture	Morris Mano	PHI
2.	Computer Organization and Architecture	William Stallings	PHI
3.	Digital Computer Electronics:	An Introduction to Microcomputers by Malvino	TMH



**COURSE OUTCOME:**

Web Technology has revolutionized mankind and entirely changed the way we look at things. Banking, Education, Retailing, Manufacturing and Research are some of the things that have undergone major transformations due to influence from web development. By adding more features, increasing the scope and reach of industries, making it available to users irrespective of their geography, web has captivated the human minds. Learning web technology is one of the top priorities for every computer enthusiast in order to better understand its working and scope. Students will understand the fundamental working technology behind web development and HTML. They will be taught concepts like JS, HTML5 thus making them capable of web development.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to the Internet and the World Wide Web	8
2.	HTML & CSS	8
3.	XML and HTML5, CSS3	8
4.	PHP Server side scripting	6
5.	Practical website development	6

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to the Internet and the World Wide Web</b>
	<ul style="list-style-type: none"> <li>Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture</li> <li>Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development.</li> <li>HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST</li> </ul>
2.	<b>HTML &amp; CSS</b>
	<ul style="list-style-type: none"> <li>Introduction to Html, Html Document structure, Html Editors, Html element/tag &amp; attributes, Designing simple page - Html tag, Head tag, Body tag;</li> <li>More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.</li> <li>Introduction to CSS, Syntax, Selectors ,Embedding CSS to Html, Formatting fonts, Text &amp; background colour, Inline styles, External and Internal Style Sheets, Borders &amp; boxing</li> </ul>
3.	<b>XML and HTML5, CSS3</b>
	<ul style="list-style-type: none"> <li>Introduction to XML, Difference b/w Html &amp; XML, XML editors, XML Elements &amp; Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.</li> <li>Introduction to HTML5, CSS3, New features, Local storage, Web Sockets, Server events, Canvas, Audio &amp; Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers</li> </ul>
4.	<b>PHP Server side scripting</b>
	<ul style="list-style-type: none"> <li>Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays Strings,</li> <li>Environment &amp; environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.</li> </ul>
5	<b>Practical website development</b>

	<ul style="list-style-type: none"> <li>• Commonly used Web Servers and browsers, Setting up a server and domain name, website types and structures,</li> <li>• Web authoring tools, Web hosting, website maintenance, generating traffic to your website.</li> </ul>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Book	Author	Publication
<b>a. Reference Books</b>			
1.	Practical Web Design for Absolute Beginners	Adrian W. West	Apress 2016
2.	Introducing Web Development	Jorg Krause	Apress 2017
3.	HTML & CSS: The Complete Reference	Thomas Powell	McGraw Hill, Fifth Edition, 2010
4.	Creating a Website: The Missing Manual	Mathew Macdonald. O'Reilly	3rd Edition

**COURSE OUTCOME:**

- To learn fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skewness and kurtosis.
- To solve problems on theory of probability, linear programming problems, transportation, assignment and game problems.
- To learn important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications..

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Basic Statistics	8
2.	Probability Distribution	10
3.	Regression	10
4.	Sample introduction, Sampling	10
5.	T-Test	10

**B. DETAILED SYLLABUS**

Unit	Unit Details Regression
1.	<b>Basic Statistics</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Preparing Frequency Distribution Table and Cumulative frequency, Measure of Central Tendency, Types: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.</li> <li>• Measure of Dispersion: Range, Quartile Deviation, mean deviation, Coefficient of mean Deviation, Standard Deviation</li> <li>• Moments: Moments About mean, Moments about any point, Moment about origin, Moment about mean in terms of moment about any point, Moment about any point in terms of Moment about mean.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Probability Distribution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Random Variable- Discrete Random and Continuous Random variable, Probability Distribution of a Random Variable, Mathematical Expectation</li> <li>• Types: Binomial, Poisson, Normal Distribution, Mean and Variance of Binomial, Poisson, and Normal Distribution.</li> <li>• Correlation: Introduction, Types, Properties, Methods of Correlation: Karl Pearson's Coefficient of Correlation, Rank Correlation and Concurrent Deviation method, Probable error</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Regression</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Aim of Regression Analysis, Types of Regression Analysis, Lines of Regression, Properties of Regression Coefficient and Regression Lines, Comparison with Correlation.</li> </ul>

	<ul style="list-style-type: none"> <li>• Curve Fitting: Straight Line, Parabolic curve, Geometric Curve and Exponential Curve Baye's Theorem in Decision Making, Forecasting Techniques</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Sample introduction, Sampling</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Meaning, methods of Sampling, Statistical Inference: Test of Hypothesis, Types of hypothesis, Procedure of hypothesis Testing, Type I and Type II error,</li> <li>• One Tailed and two tailed Test, Types of test of Significance: Test of significance for Attribute-Test of No. of success and test of proportion of success</li> <li>• Test of significance for large samples - Test of significance for single mean and Difference of mean, Test of significance for small samples</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>T-Test</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Test the significance between the mean of a random sample, between the mean of two independent samples.</li> <li>• Chi square Test, ANOVA: Meaning, Assumptions, One way classification, ANOVA Table for One-Way Classified Data</li> <li>• Conclusion of unit</li> </ul>

#### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Fundamentals of Applied statistics	Gupta S.P. and Kapoor	Sultan Chand & Sons, 1996.
2.	Introduction to Statistics	Graybill,	McGraw

# Practicals

Code: BCA01205

PROGRAMMING FUNDAMENTALS USING C LAB

2 Credits [LTP: 0-0-5]

## A. List of Programs

Part A	
	<ol style="list-style-type: none"><li>1. Find biggest number among 4 given numbers</li><li>2. Printing the reverse of an integer.</li><li>3. Printing the odd and even series of N numbers.</li><li>4. Input a string and find the number of each of the vowels appear in the string.</li><li>5. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li><li>6. Printing the reverse of a string.</li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Searching an element in an array using pointers.</li><li>8. Checking whether the given matrix is an identity matrix or not</li><li>9. Addition and subtraction of two matrices.</li><li>10. Multiplication of two matrices.</li><li>11. Print the following:</li><li>12. Reverse of an integer.</li><li>13. Odd and even series of N numbers.</li><li>14. Get a string and convert the lowercase to uppercase and vice-versa using getchar() and putchar().</li><li>15. Perform the following:</li><li>16. Input a string and find the number of each of the vowels appear in the string</li><li>17. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li></ol>

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. 1. Hello World Web Page               <ol style="list-style-type: none"> <li>a) Create a web page using basic HTML features like tags, attributes, elements and page title.</li> <li>b) How to install, and configure a web server</li> </ol> </li> <li>2. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) A more functional web page by making use of headings, paragraphs, lists, images and links.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Use different font styles.</li> <li>ii. Set background image for both the page and single elements on the page.</li> </ol> </li> </ol> </li> <li>3. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) Using textboxes, check boxes, radio buttons and submit buttons.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Control the repetition of image with background-repeat property.</li> <li>ii. Define style for links as a: link, b: active, c: hover, d: visited.</li> <li>iii. Add customized cursors for links.</li> </ol> </li> </ol> </li> <li>4. Create XMLHttpRequest and retrieve data from a text file and an XML file.</li> <li>5. Create the following webpage:               <ol style="list-style-type: none"> <li>a) Show the class timetable in a tabular format.</li> <li>b) Create a webpage using HTML to show your geolocation.</li> </ol> </li> <li>6. Create a webpage using HTML for audio and video player.</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Create a login registration form using PHP.</li> <li>8. Develop a PHP webpage to manipulating files such as creating, writing, reading and uploading.</li> <li>9. Create a dynamic webpage by using PHP conditional operators, loops and strings to create an dynamic timetable page.</li> <li>10. Develop a PHP web application track the user as how many times visited and last visited time</li> <li>11. Develop a static website – I.</li> <li>12. Develop a dynamic website –II</li> </ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCA01107**

**ENGLISH-I**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

### **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Everyday Conversations	8
2.	Asking for..	7
3.	Reporting/ Describing	7
4.	Meeting People	7
5.	Expressing & Talking about....	7

### **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Everyday Conversations</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Introducing self / others</li><li>• Weather</li><li>• Classroom</li><li>• Asking about facilities around</li><li>• Describing a person / thing</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
2.	<b>Asking for..</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Help/ Suggestion/ ideas</li><li>• Clarification/ Directions</li><li>• Time/ food</li><li>• Advice</li><li>• Uses</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
3.	<b>Reporting/ Describing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Incidences</li><li>• Personalities</li><li>• Experiences</li><li>• Wants/Needs</li><li>• Intentions</li></ul>

	<ul style="list-style-type: none"> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Meeting People</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Greetings</li> <li>• Starting the Conversation</li> <li>• Small talks</li> <li>• Closing the conversation</li> <li>• Points to cover: Vocabulary, Grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheet</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Expressing &amp; Talking about....</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Happiness/Displeasure</li> <li>• Preferences</li> <li>• Doubts</li> <li>• Views</li> <li>• Unawareness</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Interests</li> <li>• Different Cultures, Clothes, cars, institutes, situations</li> <li>• Schedules, prices</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Speak Now Level I & II	Jack C Richards & David Bohlke	Oxford Press
2.	Business Benchmark, Level –	Guy Brook-Hart	Upper Intermediate by Cambridge University Press
3.	Practical English Usage	Michel Swan	Oxford University Press
4.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English	Ronald Carter, Michael McCarthy	(South Asian edition), Cambridge University Press



**COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Communication Process	6
2.	Types of Communication & Barriers to communication	5
3.	Listening Skills & Reading Skills	5
4.	Conversation Skills	4
5.	Telephone Etiquette	4

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Communication Process</b>
	<ul style="list-style-type: none"> <li>What is communication?</li> <li>The communication model</li> <li>Elements of communication</li> <li>Importance of effective communication skills in the business world</li> <li>Components of Communication</li> <li>Process, practicing effective communication, good communication Vs effective communication, styles of communication, intercultural communication skills- need for attitude change and benefits</li> </ul>
2.	<b>Types of Communication &amp; Barriers to communication</b>
	<ul style="list-style-type: none"> <li>Verbal Communication</li> <li>Non Verbal Communication</li> <li>Written Communication</li> <li>Do's and don'ts of each type</li> <li>Barriers to effective communication and how to overcome them</li> <li>Interaction of verbal and non-verbal communication, talents of a corporate communicator, silence- merits and limitations of each type</li> </ul>
3.	<b>Listening Skills &amp; Reading Skills</b>
	<ul style="list-style-type: none"> <li>What is listening</li> <li>Various types of listening – Active, passive, selective, listening and note taking, listening and comprehending, listening to speak,</li> <li>Principles of good listening</li> <li>Techniques to develop effective listening skills</li> <li>Reading Skills- skimming, scanning and inferring- common reading techniques,</li> <li>Practicing smart reading.</li> </ul>
4.	<b>Conversation Skills</b>
	<ul style="list-style-type: none"> <li>Importance of conversation skills</li> <li>Features of a good conversation</li> <li>Tips to improve Conversation skills</li> </ul>

	<ul style="list-style-type: none"> <li>• Importance of questioning skills, techniques to ask right questions- role play situations to practice the same, discussing issues (social, political and cultural), formal and informal conversation</li> </ul>
<b>5.</b>	<b>Telephone Etiquette</b>
	<ul style="list-style-type: none"> <li>• Basic rules of telephone etiquette- formal vs. informal; tone, pitch and vocabulary related to formal ways of speaking over the phone, leaving voice messages; practice sessions (role plays)</li> <li>• <b>Persuasive communication</b> :What is persuasive communication, different techniques of persuasive communication, How to negotiate using persuasive communication, the act of negotiation, negotiation style and their contexts, fundamentals of negotiation, common hurdles in negotiation and how to overcome them</li> </ul>

**COURSE OUTCOME:**

- To acquire the knowledge of environmental studies and understand the principles of ecology and environmental issues.
- To distinguish & analyze different water treatment methods and conservation of water.
- To design innovative ideas for controlling air, noise & soil pollution.
- To develop deeper knowledge in the problems and possibilities of waste management from a national and global perspective and demonstrate socio-economic skills for sustainable development.
- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Environmental studies	6
2.	Ecology	8
3.	Natural & Biological Resources	8
4.	Social Issues	7
5.	Environmental Pollution	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1	<b>Environmental studies</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Scope</li> <li>• Importance &amp; components</li> <li>• Natural and Manmade.</li> <li>• Conclusion of the Unit</li> </ul>
2	<b>Ecology</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Concept</li> <li>• Structure and Functions of Ecosystem</li> <li>• Biotic and A biotic Factors</li> <li>• Environmental Interactions.</li> <li>• Defining Communication Theories.</li> <li>• Conclusion of the Unit</li> </ul>
3	<b>Natural &amp; Biological Resources</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Plants</li> <li>• Animal and Microorganisms.</li> <li>• Conclusion of the Unit</li> </ul>
4	<b>Social Issues</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Human Population</li> <li>• Environment</li> <li>• Conclusion of the Unit</li> </ul>

<b>5</b>	<b>Environmental Pollution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Cause</li> <li>• Effects</li> <li>• Types and Control Measures</li> <li>• Conservation and preservation of Environment.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Reference Book	Author	Edition	Publication
1.	Environmental Studies	Erach Barucha	Latest	UGC
2.	Environmental Studies	Benny Joseph	Latest	Tata McgrawHill
3.	Environmental Studies	R. Rajagopalan	Latest	Oxford University Press
4.	Principles of Environmental Science and Engineering	P. Venugoplan Rao	Latest	Prentice Hall of India.
5.	Environmental Science and Engineering	Meenakshi	Latest	Prentice Hall India.
<b>Important Web Links</b>				
1.	<a href="http://www.ct.gov/">http://www.ct.gov/</a>			
2.	<a href="http://www.energy.gov">http://www.energy.gov</a>			

## Skill Enhancement Courses (SEC)

**Code: BCA01210**

**OFFICE AUTOMATION LAB**

**1 Credit [LTP: 0-0-2]**

### A. List of Programs

1	Installing Operating Systems and Basic Software
	<b>MS Word</b>
	<ol style="list-style-type: none"> <li>1. Prepare a document about any tourist destination of your choice with appropriate pictures and editing features.</li> <li>2. Prepare a News Paper Layout. Insert appropriate pictures wherever necessary. Use the following Features: <ul style="list-style-type: none"> <li>• Three Column and Four Column setting</li> <li>• Set One or Two Advertisements</li> <li>• Use Bullets and Numbering.</li> </ul> </li> <li>3. Create a Document consisting of Bio-data. It includes <ul style="list-style-type: none"> <li>• A table giving your qualification and/or experience of work. Table should be Bordered and Shaded.</li> <li>• A Multilevel list giving your areas of interest and further areas of interest. The sub areas should be numbered as</li> <li>• 'a', 'b', etc while the areas should be numbered as '1', '2', etc.</li> <li>• The information should be divided in “General” and “Academic” sections.</li> <li>• The header should contain “BIO-DATA” while the footer should have page numbers in the format Page 1 of 10.</li> <li>• Assign a password for the document to protect it from unauthorized access.</li> </ul> </li> <li>4. Assume that you are coordinating a seminar in your organization. Write a letter to 10 different IT companies asking them to participate in the seminar using mail merge facility.</li> <li>5. Prepare a document which contains template of marks card of students. Assume that there are 10 students. The footer for the document should be 'Poornima University Jaipur'.</li> <li>6. Prepare a document about any topic In mathematics which uses mathematical symbols. (At least 5 mathematical symbols should be used). Assign a password for the document to protect it from unauthorized access. Demonstrate the use of Hyperlink Option. Sets margins to your document, a font of size and double spaced document</li> </ol>
	<b>MS – Excel</b>
	<ol style="list-style-type: none"> <li>7. Open a new workbook, save it as JavaCoffeeBar.xls. In sheet1 write following sales data for Java Coffee bar to show their first 6 months sales.</li> </ol>

	<ul style="list-style-type: none"> <li>• Select cell B4:D4 and change the horizontal alignment to center and text to 90 degree.</li> <li>• All titles should be in bold</li> <li>• Format all cells numbers to currency style and adjust width as necessary.</li> <li>• Add border to data.</li> <li>• Select the cell range A1:H1, merge and center these cells. Apply same format to A2:H2.</li> <li>• Give border, shading and pattern to data in sheet</li> <li>• Apply different font settings for all titles in sheet</li> <li>• Apply green color and bold setting to sales above 10000 (use conditional formatting)</li> <li>• Rename current worksheet as FirstHalfSales</li> </ul> <p>8. Prepare a worksheet to maintain student information. The work sheet should Contain Roll Number, Name and marks in 5 subjects. (Max Marks is 100). Validate the marks. Calculate the total marks. Assign the grade according to the following. Assign grade 'A' if the total marks is above 450. From 401 to 449 assign the grade as 'B'. From 351 to 400 assign the Grade as 'C'. From 300 to 350 the grade to be assigned is 'D'. For the total marks less than 300 No grade is assigned. A student is eligible to get a grade only when he gets 40 and above in all the subjects. In such cases the grade is “FAIL”. (Assume that there are 10 students)</p> <p>9. Prepare a pay-bill using a worksheet. The work sheet should contain Employee Id, Name, Designation, Experience and Basic Salary and Job ID. If Job Id is 1 then DA is 40% of the basic salary. HRA is Rs. 4500. If Job Id is 2 then DA is 35% of the basic salary. HRA is Rs. 3500. If Job Id is 3 then DA is 30% of the basic salary. HRA is Rs. 2500. If Job Id is 4 then DA is 25% of the basic salary and HRA is RS.2500. For all the other Job ids DA is 20% of the basic salary and HRA is Rs. 1500. For all the above Job ids PF to be deducted is 4%. For the job ids between 1-4 Rs. 100 to be deducted as Professional Tax. Find the net pay.</p> <p>10. For the above employee worksheet perform the following operations</p> <ul style="list-style-type: none"> <li>• Use filter to display the details of employees whose salary is greater than 10,000.</li> <li>• Sort the employees on the basis of their net pay</li> <li>• Use advance filter to display the details of employees whose designation is "Programmer" and Net Pay is greater than 20,000 with experience greater than 2 yrs</li> </ul> <p>11. Using Excel project the Product sales for any five products for five years.</p> <ul style="list-style-type: none"> <li>• Compute the total sales of each product in the five years.</li> <li>• Compute the total sales of all the products in five year.</li> <li>• Compute the total sales of all products for each year.</li> <li>• Represent annual sale of all the products using Pie-Chart.</li> <li>• Represent annual sales of all products using Bar Chart.</li> <li>• Represent sale of a product for five years using Pie-Chart.</li> <li>• Label and format the graphs</li> </ul> <p>12. Create a statement of Telephone Bill Charge for a customer.</p> <ul style="list-style-type: none"> <li>• Telephone Calls</li> <li>• Up to 150 calls- free</li> <li>• 151 to 500 calls- 0.80 per call</li> <li>• 501 to 1000 calls- 1.00 per call</li> <li>• 1001 to 2000 - 1.25 per call</li> <li>• Above 2000- 1.40 per call</li> </ul> <p>13. Perform Following:</p> <ul style="list-style-type: none"> <li>• Using Excel write sales data with columns product, month and sales. Write at least 5 records. Create Pivot Table chart and Report for the data.</li> </ul>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<ul style="list-style-type: none"> <li>• Create a macro to change the name of worksheet as Macro Example, merge first three columns of first row and write heading as DATA in green color with yellow background</li> <li>• Link word document in excel worksheet to show the usage of linking and embedding.</li> </ul>
	<b>MS - PowerPoint</b>
	<p>14. Assume that you are going to give a presentation about Information Technology. (Choose some latest technologies). The presentation should have minimum 10 slides. Insert appropriate images wherever necessary. Use proper formatting, Diagrams and tables. Show the usage of action buttons, hyperlinks, and animations.</p>

**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-I shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the FIRST Semester are as follows:

Code	Activity	Hours	Credits
BCA01611.1	Online Eligibility Exam (OLE)	1	0.5
BCA01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	
BCA01611.3	Online Certification Courses	-	





**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

# BCA

Batch 2019-22

# BCA



Teaching Syllabus  
for  
II Sem.

# CORE THEORY SUBJECTS

Code: BCA02101

COMPUTER NETWORKS

3 Credits [LTP: 3-0-0]

## COURSE OUTCOME:

It is important for networking professionals to have a sound grounding in the basics of networking and with the networking technology being developed thick and fast, the professionals need to be updated of them at all times. The focus of this unit is providing a background to the basics of networking and its underlying principles.

This course will explore the fundamentals of networking, the principle and purpose behind layered models, devices used in networks and their wireless connectivity and the ways to troubleshoot network related issues. The unit underpins the principles of networking and enables the learners to work towards taking up vendor certifications in the networking domain. To enable students to understand computer networking concepts, how they work, how they operate and the protocols, standards and the models associated with networking technology and their troubleshooting mechanisms.

## A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Networking Fundamentals	8
2.	Basics of Network Devices	7
3.	Basics of Network, Transport and Application Layers	7
4.	WAN Technology	7
5.	Network Operating Systems and Troubleshooting Network	7

## B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Networking Fundamentals</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Basics of Network &amp; Networking, Advantages of Networking, Types of Networks</li><li>• Network Terms- Host, Workstations, Server, Client, Node</li><li>• Types of Network Architecture- Peer-to-Peer &amp; Client/Server, Workgroup Vs. Domain</li><li>• Network Topologies, Types of Topologies, Logical and physical topologies, selecting the Right Topology</li><li>• Types of Transmission Media, Communication Modes, Wiring Standards and Cabling- straight through cable, crossover cable, rollover cable, media connectors (Fibre optic, Coaxial, and TP etc.)</li><li>• Introduction of OSI model, Seven layers of OSI model, Functions of the seven layers, Introduction of TCP/IP Model, TCP, UDP, IP, ICMP, ARP/RARP, Comparison between OSI model &amp; TCP/IP model</li><li>• Overview of Ethernet Addresses</li><li>• Conclusion of the Unit</li></ul>
2.	<b>Basics of Network Devices</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Network Devices- NIC- functions of NIC, installing NIC, Hub, Switch, Bridge, Router, Gateways, And Other Networking Devices, Repeater, CSU/DSU, and modem</li><li>• Data Link Layer: Ethernet, Ethernet standards, Ethernet Components, Point-to-Point Protocol (PPP ),PPP standards, Address Resolution Protocol, Message format, transactions</li><li>• Wireless Networking: Wireless Technology, Benefits of Wireless Technology</li><li>• Types of Wireless Networks: Ad-hoc mode, Infrastructure mode</li></ul>

	<ul style="list-style-type: none"> <li>• Wireless network Components: Wireless Access Points, Wireless NICs</li> <li>• wireless LAN standards: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, wireless LAN modulation techniques</li> <li>• wireless security Protocols: WEP,WPA, 802.1X, Installing a wireless LAN</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Basics of Network, Transport and Application Layers</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Layer: Internet Protocol (IP ), IP standards, versions, functions, IPv4 addressing, IPv4 address Classes, IPv4 address types, Subnet Mask, Default Gateway, Public &amp; Private IP Address, methods of assigning IP address, IPv6 address, types, assignment, Data encapsulation, The IPv4 Datagram Format, The IPv6 Datagram Format, Internet Control Message Protocol (ICMP ), ICMPv4, ICMPv6, Internet Group Management Protocol (IGMP ),Introduction to Routing and Switching concepts</li> <li>• Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports &amp; Sockets</li> <li>• Application Layer: DHCP, DNS, HTTP/HTTPS, FTP, TFTP, SFTP, Telnet, Email: SMTP, POP3/IMAP, NTP</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>WAN Technology</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• What Is a WAN?, WAN Switching, WAN Switching techniques Circuit Switching, Packet Switching etc., Connecting to the Internet : PSTN, ISDN, DSL, CATV, Satellite-Based Services, Last Mile Fiber, Cellular Technologies</li> <li>• Connecting LANs : Leased Lines, SONET/SDH, Packet Switching, Remote Access: Dial-up Remote Access, Virtual Private Networking, SSL VPN, Remote Terminal Emulation, Network security: Authentication and Authorization, Tunneling and Encryption Protocols, IPSec, SSL and TLS, Firewall, Other Security Appliances, Security Threats</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Network Operating Systems and Troubleshooting Network</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Operating Systems: Microsoft Operating Systems, Novell NetWare, UNIX and Linux Operating Systems, Macintosh Networking</li> <li>• Trouble Shooting Networks: Command-Line interface Tools, Network and Internet Troubleshooting, Basic Network</li> <li>• Troubleshooting : Troubleshooting Model, identify the affected area, probable cause, implement a solution, test the result, recognize the potential effects of the solution, document the solution</li> <li>• Using Network Utilities: ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat, Hardware trouble shooting tools, system monitoring tools</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr. No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1.	CCNA Cisco Certified Network Associate: Study Guide (With CD)	Todd Lamele	7th Edition (Paperback), Wiley India, 2011
2.	CCENT/CCNA ICND1 640-822 Official Cert Guide	Wendell Odom	3 Edition (Paperback), Pearson, 2013
3.	Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD)	Rick Graziani, Allan Johnson	Pearson, 2008
4	CCNA Exploration Course Booklet : Routing Protocols and Concepts	Cisco Networking Academy	Pearson, 2010

**COURSE OUTCOME:**

Object oriented programming is the most proven technique for developing reliable programs. It helps in increased productivity, reusability of code, decreases development time, and reduces cost of production to an extent. The cost of maintaining such systems have also considerably decreased. There are many languages which used the object oriented concepts and techniques. Some of them are C++, Java, Smalltalk, Objective-C, etc.

Java is a purely object oriented language. Systems/applications created using java programming language reduces the need for developing and maintain complex and space consuming applications. Java has a lot of advantages of being simple, robust, platform independent, etc. Nowadays java is also found in the mobile phones. This unit focuses on the concepts of object oriented programming language and the different constructs for creating applications in java.

To provide students with an understanding of the object oriented concepts which helps in the field of programming, management of data, etc. and of Java programming which helps to explore the object oriented nature of the language and the multi-platform versatility offered by it.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Object Oriented Programming	8
2	Basic Java Programming	10
3	Java Packages and Interfaces	10
3	Exceptions and I/O Handling	10
5	User Interface and Advanced Concepts	10

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Object Oriented Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Classes and Objects</li> <li>• Object Oriented Programming Concepts</li> <li>• Access Specifiers and Access Modifiers</li> <li>• Introduction to Java, Java Virtual Machine</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Basic Java Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Variables</li> <li>• Data Types</li> <li>• Control flow statements – if, else, switch, for, while</li> <li>• Arrays</li> </ul>

	<ul style="list-style-type: none"> <li>• Strings</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Java Packages and Interfaces</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Java classes, Java methods, Packages, Interfaces</li> <li>• Java.util, java.io, java.net, java.sql, java.applet, etc</li> <li>• Collection Framework</li> <li>• Generics</li> <li>• Wrapper classes</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Exceptions and I/O Handling</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Errors and Exceptions</li> <li>• Exception handling</li> <li>• Streams, Readers and Writers</li> <li>• Programming with Files</li> <li>• Multithreaded programming</li> <li>• Networking – Socket Programming</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>User Interface and Advanced Concepts</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• User Interface Components</li> <li>• AWT</li> <li>• Swing</li> <li>• Event Handling</li> <li>• Layouts, Forms</li> <li>• Applets</li> <li>• Annotations</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1	Java Complete Reference	Herbert Schildt	TMH
2	SAMS teach yourself Java-2	Rogers Cedenhead and Leura Lemay	3rd Edition, Pub. Pearson Education.

**COURSE OUTCOME:**

A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently. Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks. In this course the student will be learning about different data structures and their applications.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Data structures	7
2	Searching and Sorting	7
3	Stack and Queue	8
4	Linked List	7
5	Tree Graphs and their Applications	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Data structures</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition,</li> <li>• Classification of data structures: primitive and non-primitive</li> <li>• Elementary data organization</li> <li>• Time and space complexity of an algorithm (Examples), String processing.</li> <li>• Definition of dynamic memory allocation</li> <li>• Accessing the address of a variable</li> <li>• Declaring and initializing pointers -</li> <li>• Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: malloc(), calloc(), free() and realloc().</li> <li>• Recursion – Definition, advantages, Writing Recursive programs – Binomial coefficient, Fibonacci, GCD.</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Searching and Sorting</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Basic Search Techniques</b> - Sequential search, Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search.</li> <li>• <b>Sorting</b>: General background and definition - Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort</li> <li>• Conclusion of the Unit</li> </ul>

<b>3.</b>	<b>Stack, and Queue</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Stack – Definition</li> <li>• Array representation of stack</li> <li>• Operations on stack: Infix, prefix and postfix notations</li> <li>• Conversion of an arithmetic expression from Infix to postfix</li> <li>• Applications of stacks.</li> <li>• Definition of queue</li> <li>• Array representation of queue</li> <li>• Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue,</li> <li>• Operations on all types of Queues</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Linked List</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition of linked list</li> <li>• Components of linked list</li> <li>• Representation of linked list</li> <li>• Advantages and Disadvantages of linked list</li> <li>• Types of linked list: Singly linked list, doubly linked list, Circular linked list</li> <li>• Operations on singly linked list: creation, insertion, deletion, search and display</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Tree, Graphs and their Applications</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition : Tree</li> <li>• Binary tree, Complete binary tree, Binary search tree</li> <li>• Heap</li> <li>• Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node</li> <li>• Binary tree: Array representation of tree, Creation of binary tree.</li> <li>• Traversal of Binary Tree: Preorder, Inorder and postorder.</li> <li>• Graphs</li> <li>• Application of Graphs</li> <li>• Depth First search, Breadth First search.</li> <li>• Conclusion of the Unit</li> </ul>



**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr.No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1	Data Structures and Algorithm Analysis in C	Weiss	II Edition, Pearson Education, 2001
2	Schaum's outline series Data structures	Lipschutz	Tata McGraw-Hill
3	Data Structures and program designing using 'C'	Robert Kruse	Pearson Education,
4	Programming in ANSI C.	E. Balaguruswamy	Tata McGraw-Hill
5	Data Structures Using C	Bandyopadhyay	Pearson Education, 1999
6	Data Structures Using C	Tenenbaum	Pearson Education, 200
7	Introduction to Data Structures in C	Kamthane	Pearson Education 2005
8	Practical approach to Data Structures	Hanumanthappa M	Practical approach to Data Structures
9	Aaron Data Structures using C and C++	Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron	Pearson Education

**COURSE OUTCOME:**

The course provides an overview of the Linux Operating System, geared toward new users as an exploration tour and getting started guide. This unit provides examples to help the learners get a better understanding of the Linux system. The unit also provides the guidelines for the learners to take up vendor certifications.

The unit explores the basics of Linux, the underlying management of the Linux operating system and its network configuration. The complete system services of Linux is explained along with the troubleshooting.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to Operating System	7
2.	Process Management – Processes and Threads	8
3.	Process Management – Synchronization and Deadlocks	8
4.	Storage Management	6
5.	Protection and Security	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Operating System</b>
	<ul style="list-style-type: none"> <li>Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.</li> <li>History of UNIX, Features &amp; Benefits, Versions of UNIX, Features of UNIX File System,, Commonly Used Commands and getting Started (Login/Logout) .</li> <li>Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces</li> </ul>
2.	<b>Process Management – Processes and Threads</b>
	<ul style="list-style-type: none"> <li>Processes: Process concept, Process scheduling, Co-operating processes, Inter process Communication</li> <li>Threads: Introduction to Threads, Single and Multi-threaded processes</li> <li>CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling,</li> <li><b>Unix Process Management</b> The Structure of Processes: Process States and Transitions - Layout of system memory - Context of a process.</li> <li>Process Control: Process Creation – Signals – Process Termination – Invoking other programs – PID &amp; PPID – Shell on a Shell.</li> </ul>
3.	<b>Process Management – Synchronization and Deadlocks</b>
	<ul style="list-style-type: none"> <li>Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions,</li> <li>Monitors, OS Synchronization, Atomic Transactions. Deadlocks: System Model,</li> </ul>

	<ul style="list-style-type: none"> <li>Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.</li> </ul>
<b>4.</b>	<b>Storage Management</b>
	<ul style="list-style-type: none"> <li>Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.</li> <li>Virtual Memory Management: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing,</li> <li>File-System Interface: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.</li> <li>File-System Implementation: File-System structure. Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery.</li> <li>Disk Management: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation</li> <li><b>The Unix File System</b></li> <li>Inodes - Structure of a regular file – Directories - Conversion of a path name to an inode - Super block - Inode assignment to a new file - Allocation of disk blocks.</li> <li>System calls for the file System: Open – Read - Write - Lseek – Close - File creation - Creation of special files - Changing directory and root - changing owner and mode – stat and fstat - pipes - Dup - Mounting and Un mounting file systems - Link and Un link.</li> </ul>
<b>5.</b>	<b>Protection and Security</b>
	<ul style="list-style-type: none"> <li>Protection: Goals of Protection, Domain of Protection, Security: Security Problem,</li> <li>User Authentication, One – Time Password, Program Threats, System Threats,</li> <li>UNIX SYSTEM ADMINISTRATION Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, managing user accounts-adding &amp; deleting users, changing permissions and ownerships,</li> <li>Creating and managing groups, modifying group attributes, temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security &amp; Permissions, becoming super user using su.</li> <li>Getting system information with uname, host name, disk partitions &amp; sizes, users, kernel, installing and removing packages with rpm command</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Book	Author	Publication
1.	Operating System Concepts and design	Milan Milonkovic,	II Edition, McGraw Hill 1992.
2.	Operation System Concepts	Tanenbaum	2 <sup>nd</sup> Edition, Pearson Education.
3.	Operating System	William Stallings	4 <sup>th</sup> Edition, Pearson Education.
4.	Guide to UNIX Using LINUX	Jack Dent Tony Gaddis, Vikas	Thomson Pub. House Pvt. Ltd. 2010

# Practical

Code: BCA02205

COMPUTER NETWORKS LAB

2 Credits [LTP: 0-0-4]

## A. List of Programs

Part A	
	1 Implementation of TCP/IP protocol – I
	2 Implementation of TCP/IP protocol - II
	3 Troubleshooting Scenarios Network - I
	4 Troubleshooting Scenarios Network - II
	5 Router – Configuration - I
	6 Router – Configuration - II
Part B	
	7 Router – Configuration - III
	8 Configuration of IP Address for a Router – I
	9 Configuration of IP Address for a Router - II
	10 Setting up of Passwords – I
	11 Setting up of Passwords – II
	12 Setting up of Passwords - III

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. A. Write a program to print “Hello World” in Java.  . B. Write a program to add two numbers  C. Write a program to demonstrate the different access specifiers</li> <li>2. A. Write a program to demonstrate inheritance, abstraction, encapsulation and Polymorphism.  B. Write a program to find the factorial of n numbers  C. Write a program to calculate Fibonacci series  D. Write a program to add n numbers and series</li> <li>3. A. Write a program to create an array and store elements into the array.  B. Write a program to find the sum of elements in an array  C. Write a program to demonstrate switch case, if, if-else and for loop.</li> <li>4. A. Write a program to demonstrate the working of methods.  B. Write a program which has four methods – add(), subtract(), multiply() and divide() and demonstrate a simple console calculator.  C. Write a program to accept command line arguments and display them to the user  Write a program which uses different packages</li> <li>5. A. Write a program to create a package.  B. Write a program to handle different exceptions</li> <li>6. A. Write a program to demonstrate try-catch, throw and throws.  B. Write a program to accept input from the user using streams</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Write a program to read a file</li> <li>8. Write a program to write into a file</li> <li>9. A. Write a program to demonstrate client server communication (socket programming)  B. Write a program to create threads and manipulate them</li> <li>10. Write a program to create a user interface to check user authentication.</li> <li>11. Write a program to create a registration form and save the details into a file</li> <li>12. Write a program to create a small animation using applets</li> </ol>

**A. List of Programs:**

Part A	
	<ol style="list-style-type: none"><li>1. Use a recursive function to find<ol style="list-style-type: none"><li>(a) GCD of two numbers.</li><li>(b) Use a recursive function to find the Fibonacci series.</li></ol></li><li>2. Use pointers to find the length of a string and to concatenate two strings.</li><li>3. Perform the following:<ol style="list-style-type: none"><li>(a) Use pointers to copy a string and to extract a substring from a given a string.</li><li>(b) Use a recursive function for the towers of Hanoi with three discs.</li></ol></li><li>4. Perform the following:<ol style="list-style-type: none"><li>(a) Insert an integer into a given position in an array.</li><li>(b) Deleting an integer from an array.</li></ol></li><li>5. Write a program to create a linked list and to display it.</li><li>6. Perform the following:<ol style="list-style-type: none"><li>(a) Write a program to sort N numbers using insertion sort.</li><li>(b) Write a program to sort N numbers using selection sort.</li></ol></li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Inserting a node into a singly linked list.</li><li>8. Deleting a node from a singly linked list.</li><li>9. Pointer implementation of stacks.</li><li>10. Pointer implementation of queues.</li><li>11. Creating a binary search tree and traversing it using in order, preorder and post order.</li><li>12. Sort N numbers using merge sort.</li></ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCA02108**

**ENGLISH-II**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

After studying the building blocks of English like Grammar Essentials, Sentence structure and Professional writing skills, students will now learn about few advanced Grammar like Voice, Tenses, Communication concepts and so on. In the second Unit which is Advanced Grammar, they are taught concepts in Synonyms, Idioms and Phrases and Antonyms all of which give a little color to the language. Students will learn about report writing, review writing and more interesting topics in communication, which is the final topic.

## **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Comprehension	8
2.	Short Paragraph Writing	7
3.	Review writing	7
4.	Writing for Social Media	7
5.	Presentations & Miscellaneous	7

## **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Comprehension</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Comprehension passage 1</li><li>• Comprehension passage 2</li><li>• Comprehension passage 3</li><li>• Comprehension passage 4</li><li>• Comprehension passage 5</li></ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"><li>• Conclusion of Unit</li></ul>
2.	<b>Short Paragraph Writing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Topic 1</li><li>• Topic 2</li><li>• Topic 3</li><li>• Topic 4</li><li>• Topic 5</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences</li><li>• Conclusion of Unit</li></ul>
3.	<b>Review writing</b>

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> </ul> <p>Topic 1 – Book [can be a story review for average students]  Topic 2 - Movie review [different kinds of movies can be suggested too for practice]  Topic 3 – Another Movie review  Topic 4 – Hotel / Café / Recreations centre Review  Topic 5 – Electronic Gadget Review (Laptop/smart phone / speakers/ PSP/ etc.)</p> <p>What is a review? How to write a review. Different types of reviews.</p> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Writing for Social Media</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Writing for social media: Facebook, Inked-in</li> <li>• Points to remember while writing on the social media. How to write Profile summary.</li> <li>• What is a blog? How to write a blog?</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Presentations &amp; Miscellaneous</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Formal Informal</li> <li>• Debate</li> <li>• Discussions</li> <li>• Pick &amp; Speak</li> </ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <p>Usage of Phrases &amp; Idioms</p> <p>Revision of English I &amp; II</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Practical English Usage	Michel Swan	Oxford University Press
2.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English		South Asian edition), Cambridge University Press
3.	Learn Correct English: Grammar, Usage and Composition	Shiv K. Kumar & Hemalatha Nagarajan	Pearson, New Delhi, India
4.	Grammar of the Modern English Language	Sukhdev Singh & Balbir Singh	Foundation Books, New Delhi
5.	Communicative English for Engineers and Professionals	Nitin Bhatnagar and Mamta Bhatnagar	Pearson( New Delhi)
6.	Communicative grammar and composition	Rajesh.K.Lidiya	Oxford Univ Press, New Delhi.



<b>Code: BCA02209</b>	<b>LIFE &amp; CAREER SKILLS-I</b>	<b>1 Credit [LTP: 0-0-2]</b>
-----------------------	-----------------------------------	------------------------------

• **LIST OF ACTIVITIES**

<b>Part - A</b>	
1.	Self-Introduction & knowing your environment
2.	GOAL Setting & Planning
3.	Time Management & Team Work
4.	Personal Grooming and Body language
5.	Etiquettes (Personal, Social, Professional & Corporate) etiquettes
6.	Reading skills: General & Technical Articles
<b>Part - B</b>	
7.	Listening Skills: Analysis of videos by famous Personalities
8.	Writing Skills: Picture perception & Story Making by jumbled words
9.	Speaking Skills: Extempore, JAM & Me against myself
10.	Role Plays
11.	Resume Writing
12.	Group Discussion

**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-II shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the SECOND Semester are as follows:

Code	Activity	Hours	Credits
BCA02610.1	Online Eligibility Exam (OLE)	1	0.5
BCA02610.2	Campus Recruitment Training (CRT) -Introduction to Public Speaking	3	
BCA02610.3	Online Certification Courses	-	

# POORNIMA UNIVERSITY, JAIPUR

## BCA (Data Science) First Year

### Teaching Scheme for First Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCD01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCD01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCD01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCD01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCD01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BCD01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCD01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCD01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCD01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCD01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCD01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCD01611.3	Online Certification Courses	-	-	-	-	-	-			
	Total	20	1	14				25.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (Data Science) First Year

### Teaching Scheme for Second Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCD02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCD02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCD02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCD02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCD02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCD02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCD02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCD02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCD02610.2	Campus Recruitment Training (CRT) - Public Speaking	3	-	-	-	-	-			
BCD02610.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	16				23.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (Data Science) Second Year

### Teaching Scheme for Third Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCD03101	Statistics & Probability-I	3	1	-	40	60	100	4	Theory	Core Course
BCD03102	Database Management System	3	-	-	40	60	100	3	Theory	Core Course
BCD03103	Python Programming	3	-	-	40	60	100	3	Theory	Core Course
BCD03204	Database Management System Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD03205	Python Programming Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD03106.1	Data Analytics using Excel	3	-	-	40	60	100	3	Theory	Departmental Elective: ANYONE
BCD03106.2	Software Engineering				40	60	100		Theory	
BSE03151	Fundamentals of IoT and its Applications	3	-	-	40	60	100	3	Theory	Open Elective (School Level) ANYONE
BSE03152	Introduction to Animation and Photography				40	60	100		Theory	
BSE03153	Python Programming *				40	60	100		Theory	
BSE03154	Blockchain Fundamentals				40	60	100		Theory	
BSE03155	Big Data Analytics				40	60	100		Theory	
BSE03156	Introduction to Digital Marketing				40	60	100		Theory	
BCD03313	Summer Project	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCD03414	Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCD03215	Personality Development	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD03216	Life & Career Skills-II	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD03617	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCD03617.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BCD03617.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCD03617.3	Online Certification Courses	-	-	-	-	-	-			
	Total	17	1	17				24.5		
	Total Teaching Hours	35						24.5		

# POORNIMA UNIVERSITY, JAIPUR

## BCA (Data Science) Second Year

### Teaching Scheme for Fourth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCD04101	Machine Learning	3	-	-	40	60	100	3	Theory	Core Course
BCD04102	R Programming	3	-	-	40	60	100	3	Theory	Core Course
BCD04103	NoSQL Database	3	-	-	40	60	100	3	Theory	Core Course
BCD04204	Machine Learning Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD04205	R Programming Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD04206	NoSQL Database Lab	-	-	2	60	40	100	1	Practical	Core Course
BCD04107.1	Sampling Methods	3	-	-	40	60	100	3	Theory	Departmental Elective: ANYONE
BCD04107.2	Statistical Inference				40	60	100		Theory	
	Annexure 1	3	-	-	40	60	100	3	Theory	Open Elective (University Level) ANYONE
BCD04408	Industrial Training Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCD04209	Logical Reasoning and Thinking	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD04210	Life & Career Skills-III	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD04611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCD04611.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BCD04611.2	Non Syllabus Project (NSP)	-	-	-	-	-	-			
BCD04611.3	Online Certification Courses	-	-	-	-	-	-			
	Total	17	0	16				23.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA (Data Science) Third Year

### Teaching Scheme for Fifth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCD05101	Advanced Machine Learning	4	-	-	40	60	100	4	Theory	Core Course
BCD05102	Big Data Analytics	4	-	-	40	60	100	4	Theory	Core Course
BCD05103	Dimension Reduction and Model Validation	4	-	-	40	60	100	4	Theory	Core Course
BCD05204	Advanced Machine Learning Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD05205	Big Data Analytics Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD05206	Dimension Reduction and Model Validation Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD05107.1	Multivariate Statistical Analysis	3	-	-	40	60	100	3	Theory	Departmental Elective
BCD05107.2	Design and Analysis of Experiments				40	60	100		Theory	
BCD05208	Life & Career Skills-IV	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD05609	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCD05609.1	Campus Recruitment Training/OLE	3	-	-	-	-	-			
BCD05609.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCD05609.3	Online Certification Courses	-	-	-	-	-	-			
	Total	18	0	15				22.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA (Data Science) Third Year

### Teaching Scheme for Sixth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCD06301	Major Project / Internship	-	-	12	60	40	100	12	Practical	Ability Enhancement Compulsory Course
BCD06602	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	-	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCD06602.1	Campus Recruitment Training/OLE	-	-	-	-	-	-	-		
BCD06602.2	Non Syllabus Project (NSP)	-	-	-	-	-	-	-		
BCD06602.3	Online Certification Courses	-	-	-	-	-	-	-		
	Total	0	0	12				12		
	Total Teaching Hours	12						12		



Summary Sheet for Teaching Scheme (Credits)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Total Credits
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	13	4	-	-	6	1	-	1	0.5	25.5
II	13	6	-	-	3	-	-	1	0.5	23.5
III	10	4	3	3	-	2	-	2	0.5	24.5
IV	9	5	3	3	-	1	-	2	0.5	23.5
V	12	6	3	-	-	-	-	1	0.5	22.5
VI	-	-	-	-	-	12	-	-	-	12
Total	57	25	9	6	9	16	0	7	2.5	131.5

Summary Sheet for Teaching Scheme (Subjects)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Remarks
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	4	2	-	-	2	1	-	1	3	-
II	4	3	-	-	1	-	-	1	3	-
III	3	2	2	6	-	2	-	2	3	School Level Open Elective
IV	3	3	2	25	-	1	-	2	3	University Level Open Elective
V	3	3	2	-	-	-	-	1	3	-
VI	-	-	-	-	-	1	-	-	3	Internship for 6 months
Total	17	13	6	31	3	5	0	7	18	100

## Annexure - I

### Open Elective Courses at University Level in IV Semester (For All Schools)

Sr. No.	Course Code	Course Name	Teaching Department
1	BOE04111	Industrial Psychology and Sociology	Mechanical Engineering
2	BOE04112	Total Quality Management	Mechanical Engineering
3	BOE04113	Project Management	Mechanical Engineering
4	BOE04114	Logistics and Supply Chain Management	Mechanical Engineering
5	BOE04115	Basics of Petro Industry	Mechanical Engineering
6	BOE04116	Nano Science and Technology	Electrical & Electronics Engineering
7	BOE04117	Non Conventional Energy Sources	Electrical & Electronics Engineering
8	BOE04118	Introduction to Soft Computing	Electrical & Electronics Engineering
9	BOE04119	IPR and Patents	Electrical & Electronics Engineering
10	BOE04120	Artificial intelligence	Electrical & Electronics Engineering
11	BOE04121	E-commerce	Computer Engineering
12	BOE04122	Management Information System (MIS)	Computer Engineering
13	BOE04123	IT Act and Cyber Law	Computer Engineering
14	BOE04124	Python	Computer Engineering
15	BOE04125	Basics of UX/UI Design	Computer Engineering
16	BOE04126	Values and Professional Ethics	SMC
17	BOE04127	Digital Marketing	SMC
18	BOE04128	Business Research	SMC
19	BOE04129	Basics of Economics	SMC
20	BOE04130	Entrepreneurship	SMC
21	BOE04131	Essentials of Management	SMC
22	BOE04132	Organizational Behaviour& Cyber Law	SMC
23	BOE04133	Disaster Management	SPA
24	BOE04134	Foreign Language French & Japanese	SPA
25	BOE04135	Creative Thinking	SDA



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE & ENGINEERING

# BCA

Data Science  
Batch 2019-22

## BCA- DATA SCIENCE



July 2019

Teaching Scheme for  
BCA –Data Science  
Detailed Syllabus for  
I & II SEM

POORNIMA UNIVERSITY, JAIPUR										
BCA (Data Science) First Year (2019-2022)										
Teaching Scheme for First Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credi ts	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Tota l			
BCD01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCD01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCD01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCD01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCD01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practica l	Core Course
BCD01206	Web Designing Lab	-	-	4	60	40	100	2	Practica l	Core Course
BCD01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCD01208	Language Lab	-	-	2	60	40	100	1	Practica l	Ability Enhancement Compulsory Course
BCD01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCD01210	Office Automation Lab	-	-	2	60	40	100	1	Practica l	Skill Enhancement Course
BCD01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practica l	Social Outreach, Discipline & Extra Curricular Activities
BCD01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCD01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCD01611.3	Online Certification Courses	-	-	-	-	-	-			
	Total	20	1	14				25.5		
	Total Teaching Hours	35								

POORNIMA UNIVERSITY, JAIPUR										
BCA (Data Science) First Year (2019-2022)										
Teaching Scheme for Second Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCD02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCD02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCD02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCD02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCD02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCD02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCD02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCD02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCD02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCD02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCD02610.2	Campus Recruitment Training (CRT) - Public Speaking	3	-	-	-	-	-			
BCD02610.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	16				23.5		
	Total Teaching Hours	35						23.5		



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

# BCA

## Data Science

### Batch 2019-22

# BCA- DATA SCIENCE



## Teaching Syllabus for I Sem.



## CORE THEORY SUBJECTS

Code: BCD01101

PROGRAMMING FUNDAMENTALS USING C

3 Credits [LTP: 3-0-0]

### COURSE OUTCOME:

Even with the introduction of several high level languages and frameworks, the development of procedural codes is important in several commercial app developments. The object oriented platforms and event driven systems use procedural languages for coding integral command content.

C is an important procedural language and was developed initially to write the UNIX operating system. UNIX operating system, C compiler and all UNIX application programs are written in C. C is popular because, it is easy to learn, produces efficient programs, can handle low-level activities, and can be compiled on a variety of platforms.

This unit focuses on all the basic concepts, syntax and constructs of the C language. For students, who are new to programming, this unit can be considered as the starting point before taking up any other programming oriented units. The students will be implementing the concepts explained here to create simple to complex programs.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Overview of Programming	6
2.	Fundamentals of C programming	6
3.	Advanced programming techniques	8
4.	Dynamic data structures in C	8
5.	Additional features	8

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Overview of Programming</b>
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Introduction to computer based problem solving</b>, Program design and implementation issues- Flowcharts &amp; Algorithms, Top down design &amp; stepwise refinement</li><li><b>Programming environment</b> – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters.</li><li>Conclusion of the Unit</li></ul>
2.	<b>Fundamentals of C programming</b>
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Overview of C</b>, Data Types, Constants &amp; Variables, Operators &amp; Expressions</li><li><b>Control constructs</b>-if then, for, while, <b>Arrays</b>- single &amp; multidimensional arrays</li><li><b>Functions</b>-fundamentals – general form, function arguments, return value</li><li><b>Basic I/O</b>-formatted and Unformatted I/O, <b>Advanced features</b>- Type modifiers and storage class specifies for data types, Bit operators, Operator, &amp;operator, * operator, Type casting, type conversion.</li><li>Conclusion of the Unit</li></ul>
3.	<b>Advanced programming techniques</b>
	<ul style="list-style-type: none"><li>Introduction of Unit</li></ul>

	<ul style="list-style-type: none"> <li>• <b>Control constructs</b>- Do while, Switch statement, break and continue, exit() function, go to and label</li> <li>• <b>Scope rules</b>- Local &amp; global variables, scope rules of functions</li> <li>• <b>Functions</b>-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi.</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Dynamic data structures in C</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Pointers</b>- The &amp; and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function retuning pointers</li> <li>• <b>Structures</b>- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures</li> <li>• <b>Unions</b> – Declaration, uses, enumerated data-types, typedef.</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Additional features</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>File Handling</b> – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf</li> <li>• <b>C Preprocessor</b>- #define, #include, #undef, Conditional compilation directives.</li> <li>• <b>C standard library and header files</b>: Header files, string functions, mathematical functions, Date and Time functions.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Let us C, 6 <sup>th</sup> Edition	Yashwant Kanetka	PBP Publication
2.	The C programming Language	Richie and Kenninghan	BPB Publication,2004
3.	Programming in ANSI C 3 <sup>rd</sup> Edition, 2005	Balaguruswamy	Tata McGraw Hill



### COURSE OUTCOME:

- To understand and the use of basic concepts of Computer components.
- To understand the concept of memory hierarchy and the use of various input-output devices.
- To understand the various computer languages, operating system functions and the application of number systems.
- To understand the basic Computer Networking principles and the applications of WWW, multimedia and the usage of electronic mail.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Register Transfer and Micro-operation	8
2.	Basic Computer Organization	8
3.	Micro Programmed Control Unit	8
4.	Computer Arithmetic	6
5.	Modes of Data Transfer and Memory Organization	6

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Register Transfer and Micro-operation</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer.</li> <li>• Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor,</li> <li>• Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Basic Computer Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Instruction Codes, Computer Registers: Common bus system, Computer Instructions:</li> <li>• Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions.</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Micro Programmed Control Unit</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines.</li> <li>• Design of Control Unit, Central Processing Unit: Introduction, General Register Organization,</li> <li>• Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes.</li> <li>• Conclusion of Unit</li> </ul>
4.	<b>Computer Arithmetic</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Addition and Subtraction,</li> <li>• Multiplication Algorithms (Booth algorithm), Division Algorithms,</li> </ul>

	<ul style="list-style-type: none"> <li>• Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors.</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Modes of Data Transfer and Memory Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Modes of Data Transfer: Priority Interrupt, Direct Memory Access,</li> <li>• Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory,</li> <li>• Associative Memory, Cache Memory, Virtual Memory</li> <li>• Conclusion of unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Computer System Architecture	Morris Mano	PHI
2.	Computer Organization and Architecture	William Stallings	PHI
3.	Digital Computer Electronics:	An Introduction to Microcomputers by Malvino	TMH

**COURSE OUTCOME:**

Web Technology has revolutionized mankind and entirely changed the way we look at things. Banking, Education, Retailing, Manufacturing and Research are some of the things that have undergone major transformations due to influence from web development. By adding more features, increasing the scope and reach of industries, making it available to users irrespective of their geography, web has captivated the human minds. Learning web technology is one of the top priorities for every computer enthusiast in order to better understand its working and scope. Students will understand the fundamental working technology behind web development and HTML. They will be taught concepts like JS, HTML5 thus making them capable of web development.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to the Internet and the World Wide Web	8
2.	HTML & CSS	8
3.	XML and HTML5, CSS3	8
4.	PHP Server side scripting	6
5.	Practical website development	6

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to the Internet and the World Wide Web</b>
	<ul style="list-style-type: none"> <li>Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture</li> <li>Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development.</li> <li>HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST</li> </ul>
2.	<b>HTML &amp; CSS</b>
	<ul style="list-style-type: none"> <li>Introduction to Html, Html Document structure, Html Editors, Html element/tag &amp; attributes, Designing simple page - Html tag, Head tag, Body tag;</li> <li>More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.</li> <li>Introduction to CSS, Syntax, Selectors ,Embedding CSS to Html, Formatting fonts, Text &amp; background colour, Inline styles, External and Internal Style Sheets, Borders &amp; boxing</li> </ul>
3.	<b>XML and HTML5, CSS3</b>
	<ul style="list-style-type: none"> <li>Introduction to XML, Difference b/w Html &amp; XML, XML editors, XML Elements &amp; Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.</li> <li>Introduction to HTML5, CSS3, New features, Local storage, Web Sockets, Server events, Canvas, Audio &amp; Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers</li> </ul>
4.	<b>PHP Server side scripting</b>
	<ul style="list-style-type: none"> <li>Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays Strings,</li> <li>Environment &amp; environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.</li> </ul>
5	<b>Practical website development</b>

	<ul style="list-style-type: none"> <li>• Commonly used Web Servers and browsers, Setting up a server and domain name, website types and structures,</li> <li>• Web authoring tools, Web hosting, website maintenance, generating traffic to your website.</li> </ul>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Book	Author	Publication
<b>a. Reference Books</b>			
1.	Practical Web Design for Absolute Beginners	Adrian W. West	Apress 2016
2.	Introducing Web Development	Jorg Krause	Apress 2017
3.	HTML & CSS: The Complete Reference	Thomas Powell	McGraw Hill, Fifth Edition, 2010
4.	Creating a Website: The Missing Manual	Mathew Macdonald. O'Reilly	3rd Edition

**COURSE OUTCOME:**

- To learn fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skewness and kurtosis.
- To solve problems on theory of probability, linear programming problems, transportation, assignment and game problems.
- To learn important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications..

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Basic Statistics	8
2.	Probability Distribution	10
3.	Regression	10
4.	Sample introduction, Sampling	10
5.	T-Test	10

**B. DETAILED SYLLABUS**

Unit	Unit Details Regression
1.	<b>Basic Statistics</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Preparing Frequency Distribution Table and Cumulative frequency, Measure of Central Tendency, Types: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.</li> <li>• Measure of Dispersion: Range, Quartile Deviation, mean deviation, Coefficient of mean Deviation, Standard Deviation</li> <li>• Moments: Moments About mean, Moments about any point, Moment about origin, Moment about mean in terms of moment about any point, Moment about any point in terms of Moment about mean.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Probability Distribution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Random Variable- Discrete Random and Continuous Random variable, Probability Distribution of a Random Variable, Mathematical Expectation</li> <li>• Types: Binomial, Poisson, Normal Distribution, Mean and Variance of Binomial, Poisson, and Normal Distribution.</li> <li>• Correlation: Introduction, Types, Properties, Methods of Correlation: Karl Pearson's Coefficient of Correlation, Rank Correlation and Concurrent Deviation method, Probable error</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Regression</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Aim of Regression Analysis, Types of Regression Analysis, Lines of Regression, Properties of Regression Coefficient and Regression Lines, Comparison with Correlation.</li> <li>• Curve Fitting: Straight Line, Parabolic curve, Geometric Curve and Exponential Curve Baye's Theorem in Decision Making, Forecasting Techniques</li> </ul>

	<ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Sample introduction, Sampling</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Meaning, methods of Sampling, Statistical Inference: Test of Hypothesis, Types of hypothesis, Procedure of hypothesis Testing, Type I and Type II error,</li> <li>• One Tailed and two tailed Test, Types of test of Significance: Test of significance for Attribute-Test of No. of success and test of proportion of success</li> <li>• Test of significance for large samples - Test of significance for single mean and Difference of mean, Test of significance for small samples</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>T-Test</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Test the significance between the mean of a random sample, between the mean of two independent samples.</li> <li>• Chi square Test, ANOVA: Meaning, Assumptions, One way classification, ANOVA Table for One-Way Classified Data</li> <li>• Conclusion of unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Fundamentals of Applied statistics	Gupta S.P. and Kapoor	Sultan Chand & Sons, 1996.
2.	Introduction to Statistics	Graybill,	McGraw

# Practicals

Code: BCD01205

PROGRAMMING FUNDAMENTALS USING C LAB

2 Credits [LTP: 0-0-5]

## A. List of Programs

Part A	
	<ol style="list-style-type: none"><li>1. Find biggest number among 4 given numbers</li><li>2. Printing the reverse of an integer.</li><li>3. Printing the odd and even series of N numbers.</li><li>4. Input a string and find the number of each of the vowels appear in the string.</li><li>5. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li><li>6. Printing the reverse of a string.</li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Searching an element in an array using pointers.</li><li>8. Checking whether the given matrix is an identity matrix or not</li><li>9. Addition and subtraction of two matrices.</li><li>10. Multiplication of two matrices.</li><li>11. Print the following:</li><li>12. Reverse of an integer.</li><li>13. Odd and even series of N numbers.</li><li>14. Get a string and convert the lowercase to uppercase and vice--versa using getchar() and putchar().</li><li>15. Perform the following:</li><li>16. Input a string and find the number of each of the vowels appear in the string</li><li>17. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li></ol>

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. 1. Hello World Web Page               <ol style="list-style-type: none"> <li>a) Create a web page using basic HTML features like tags, attributes, elements and page title.</li> <li>b) How to install, and configure a web server</li> </ol> </li> <li>2. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) A more functional web page by making use of headings, paragraphs, lists, images and links.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Use different font styles.</li> <li>ii. Set background image for both the page and single elements on the page.</li> </ol> </li> </ol> </li> <li>3. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) Using textboxes, check boxes, radio buttons and submit buttons.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Control the repetition of image with background-repeat property.</li> <li>ii. Define style for links as a: link, b: active, c: hover, d: visited.</li> <li>iii. Add customized cursors for links.</li> </ol> </li> </ol> </li> <li>4. Create XMLHttpRequest and retrieve data from a text file and an XML file.</li> <li>5. Create the following webpage:               <ol style="list-style-type: none"> <li>a) Show the class timetable in a tabular format.</li> <li>b) Create a webpage using HTML to show your geolocation.</li> </ol> </li> <li>6. Create a webpage using HTML for audio and video player.</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Create a login registration form using PHP.</li> <li>8. Develop a PHP webpage to manipulating files such as creating, writing, reading and uploading.</li> <li>9. Create a dynamic webpage by using PHP conditional operators, loops and strings to create an dynamic timetable page.</li> <li>10. Develop a PHP web application track the user as how many times visited and last visited time</li> <li>11. Develop a static website – I.</li> <li>12. Develop a dynamic website –II</li> </ol>



# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCD01107**

**ENGLISH-I**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

### **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Everyday Conversations	8
2.	Asking for..	7
3.	Reporting/ Describing	7
4.	Meeting People	7
5.	Expressing & Talking about....	7

### **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Everyday Conversations</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Introducing self / others</li><li>• Weather</li><li>• Classroom</li><li>• Asking about facilities around</li><li>• Describing a person / thing</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
2.	<b>Asking for..</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Help/ Suggestion/ ideas</li><li>• Clarification/ Directions</li><li>• Time/ food</li><li>• Advice</li><li>• Uses</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
3.	<b>Reporting/ Describing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Incidences</li><li>• Personalities</li><li>• Experiences</li><li>• Wants/Needs</li><li>• Intentions</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li></ul>

	<ul style="list-style-type: none"> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Meeting People</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Greetings</li> <li>• Starting the Conversation</li> <li>• Small talks</li> <li>• Closing the conversation</li> <li>• Points to cover: Vocabulary, Grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheet</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Expressing &amp; Talking about....</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Happiness/Displeasure</li> <li>• Preferences</li> <li>• Doubts</li> <li>• Views</li> <li>• Unawareness</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets Interests</li> <li>• Different Cultures, Clothes , cars, institutes, situations</li> <li>• Schedules, prices</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Speak Now Level I & II	Jack C Richards & David Bohlke	Oxford Press
2.	Business Benchmark, Level –	Guy Brook-Hart	Upper Intermediate by Cambridge University Press
3.	Practical English Usage	Michel Swan	Oxford University Press
4.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English	Ronald Carter, Michael McCarthy	(South Asian edition), Cambridge University Press

**COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Communication Process	6
2.	Types of Communication & Barriers to communication	5
3.	Listening Skills & Reading Skills	5
4.	Conversation Skills	4
5.	Telephone Etiquette	4

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Communication Process</b>
	<ul style="list-style-type: none"> <li>What is communication?</li> <li>The communication model</li> <li>Elements of communication</li> <li>Importance of effective communication skills in the business world</li> <li>Components of Communication</li> <li>Process, practicing effective communication, good communication Vs effective communication, styles of communication, intercultural communication skills- need for attitude change and benefits</li> </ul>
2.	<b>Types of Communication &amp; Barriers to communication</b>
	<ul style="list-style-type: none"> <li>Verbal Communication</li> <li>Non Verbal Communication</li> <li>Written Communication</li> <li>Do's and don'ts of each type</li> <li>Barriers to effective communication and how to overcome them</li> <li>Interaction of verbal and non-verbal communication, talents of a corporate communicator, silence- merits and limitations of each type</li> </ul>
3.	<b>Listening Skills &amp; Reading Skills</b>
	<ul style="list-style-type: none"> <li>What is listening</li> <li>Various types of listening – Active, passive, selective, listening and note taking, listening and comprehending, listening to speak,</li> <li>Principles of good listening</li> <li>Techniques to develop effective listening skills</li> <li>Reading Skills- skimming, scanning and inferring- common reading techniques,</li> <li>Practicing smart reading.</li> </ul>
4.	<b>Conversation Skills</b>
	<ul style="list-style-type: none"> <li>Importance of conversation skills</li> <li>Features of a good conversation</li> <li>Tips to improve Conversation skills</li> <li>Importance of questioning skills, techniques to ask right questions- role play situations to practice the same, discussing issues (social, political and cultural), formal and informal conversation</li> </ul>

5.	Telephone Etiquette
	<ul style="list-style-type: none"> <li>• Basic rules of telephone etiquette- formal vs. informal; tone, pitch and vocabulary related to formal ways of speaking over the phone, leaving voice messages; practice sessions (role plays)</li> <li>• <b>Persuasive communication</b> :What is persuasive communication, different techniques of persuasive communication, How to negotiate using persuasive communication, the act of negotiation, negotiation style and their contexts, fundamentals of negotiation, common hurdles in negotiation and how to overcome them</li> </ul>

**COURSE OUTCOME:**

The student would be able:

- To acquire the knowledge of environmental studies and understand the principles of ecology and environmental issues.
- To distinguish & analyze different water treatment methods and conservation of water.
- To design innovative ideas for controlling air, noise & soil pollution.
- To develop deeper knowledge in the problems and possibilities of waste management from a national and global perspective and demonstrate socio-economic skills for sustainable development.
- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Environmental studies	6
2.	Ecology	8
3.	Natural & Biological Resources	8
4.	Social Issues	7
5.	Environmental Pollution	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
<b>1</b>	<b>Environmental studies</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Scope</li> <li>• Importance &amp; components</li> <li>• Natural and Manmade.</li> <li>• Conclusion of the Unit</li> </ul>
<b>2</b>	<b>Ecology</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Concept</li> <li>• Structure and Functions of Ecosystem</li> <li>• Biotic and A biotic Factors</li> <li>• Environmental Interactions.</li> <li>• Defining Communication Theories.</li> <li>• Conclusion of the Unit</li> </ul>
<b>3</b>	<b>Natural &amp; Biological Resources</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Plants</li> <li>• Animal and Microorganisms.</li> <li>• Conclusion of the Unit</li> </ul>
<b>4</b>	<b>Social Issues</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Human Population</li> <li>• Environment</li> <li>• Conclusion of the Unit</li> </ul>
<b>5</b>	<b>Environmental Pollution</b>

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Cause</li> <li>• Effects</li> <li>• Types and Control Measures</li> <li>• Conservation and preservation of Environment.</li> <li>• Conclusion of the Unit</li> </ul>
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Reference Book	Author	Edition	Publication
1.	Environmental Studies	Erach Barucha	Latest	UGC
2.	Environmental Studies	Benny Joseph	Latest	Tata McgrawHill
3.	Environmental Studies	R. Rajagopalan	Latest	Oxford University Press
4.	Principles of Environmental Science and Engineering	P. Venugoplan Rao	Latest	Prentice Hall of India.
5.	Environmental Science and Engineering	Meenakshi	Latest	Prentice Hall India.
<b>Important Web Links</b>				
1.	<a href="http://www.ct.gov/">http://www.ct.gov/</a>			
2.	<a href="http://www.energy.gov">http://www.energy.gov</a>			

## Skill Enhancement Courses (SEC)

**Code: BCD01210**

**OFFICE AUTOMATION LAB**

**1 Credit [LTP: 0-0-2]**

### A. List of Programs

1	Installing Operating Systems and Basic Software
	<b>MS Word</b>
	<ol style="list-style-type: none"> <li>1. Prepare a document about any tourist destination of your choice with appropriate pictures and editing features.</li> <li>2. Prepare a News Paper Layout. Insert appropriate pictures wherever necessary. Use the following Features: <ul style="list-style-type: none"> <li>• Three Column and Four Column setting</li> <li>• Set One or Two Advertisements</li> <li>• Use Bullets and Numbering.</li> </ul> </li> <li>3. Create a Document consisting of Bio-data. It includes <ul style="list-style-type: none"> <li>• A table giving your qualification and/or experience of work. Table should be Bordered and Shaded.</li> <li>• A Multilevel list giving your areas of interest and further areas of interest. The sub areas should be numbered as</li> <li>• 'a', 'b', etc while the areas should be numbered as '1', '2', etc.</li> <li>• The information should be divided in “General” and “Academic” sections.</li> <li>• The header should contain “BIO-DATA” while the footer should have page numbers in the format Page 1 of 10.</li> <li>• Assign a password for the document to protect it from unauthorized access.</li> </ul> </li> <li>4. Assume that you are coordinating a seminar in your organization. Write a letter to 10 different IT companies asking them to participate in the seminar using mail merge facility.</li> <li>5. Prepare a document which contains template of marks card of students. Assume that there are 10 students. The footer for the document should be 'Poornima University Jaipur'.</li> <li>6. Prepare a document about any topic In mathematics which uses mathematical symbols. (At least 5 mathematical symbols should be used). Assign a password for the document to protect it from unauthorized access. Demonstrate the use of Hyperlink Option. Sets margins to your document, a font of size and double spaced document</li> </ol>
	<b>MS – Excel</b>
	<ol style="list-style-type: none"> <li>7. Open a new workbook, save it as JavaCoffeeBar.xls. In sheet1 write following sales data for Java Coffee bar to show their first 6 months sales. <ul style="list-style-type: none"> <li>• Select cell B4:D4 and change the horizontal alignment to center and text to 90 degree.</li> <li>• All titles should be in bold</li> </ul> </li> </ol>

- Format all cells numbers to currency style and adjust width as necessary.
  - Add border to data.
  - Select the cell range A1:H1, merge and center these cells. Apply same format to A2:H2.
  - Give border, shading and pattern to data in sheet
  - Apply different font settings for all titles in sheet
  - Apply green color and bold setting to sales above 10000 (use conditional formatting)
  - Rename current worksheet as FirstHalfSales
8. Prepare a worksheet to maintain student information. The work sheet should Contain Roll Number, Name and marks in 5 subjects. (Max Marks is 100). Validate the marks. Calculate the total marks. Assign the grade according to the following. Assign grade 'A' if the total marks is above 450. From 401 to 449 assign the grade as 'B'. From 351 to 400 assign the Grade as 'C'. From 300 to 350 the grade to be assigned is 'D'. For the total marks less than 300 No grade is assigned. A student is eligible to get a grade only when he gets 40 and above in all the subjects. In such cases the grade is "FAIL". (Assume that there are 10 students)
  9. Prepare a pay-bill using a worksheet. The work sheet should contain Employee Id, Name, Designation, Experience and Basic Salary and Job ID. If Job Id is 1 then DA is 40% of the basic salary. HRA is Rs. 4500. If Job Id is 2 then DA is 35% of the basic salary. HRA is Rs. 3500. If Job Id is 3 then DA is 30% of the basic salary. HRA is Rs. 2500. If Job Id is 4 then DA is 25% of the basic salary and HRA is RS.2500. For all the other Job ids DA is 20% of the basic salary and HRA is Rs. 1500. For all the above Job ids PF to be deducted is 4%. For the job ids between 1-4 Rs. 100 to be deducted as Professional Tax. Find the net pay.
  10. For the above employee worksheet perform the following operations
    - Use filter to display the details of employees whose salary is greater than 10,000.
    - Sort the employees on the basis of their net pay
    - Use advance filter to display the details of employees whose designation is "Programmer" and Net Pay is greater than 20,000 with experience greater than 2 yrs
  11. Using Excel project the Product sales for any five products for five years.
    - Compute the total sales of each product in the five years.
    - Compute the total sales of all the products in five year.
    - Compute the total sales of all products for each year.
    - Represent annual sale of all the products using Pie-Chart.
    - Represent annual sales of all products using Bar Chart.
    - Represent sale of a product for five years using Pie-Chart.
    - Label and format the graphs
  12. Create a statement of Telephone Bill Charge for a customer.
    - Telephone Calls
    - Up to 150 calls- free
    - 151 to 500 calls- 0.80 per call
    - 501 to 1000 calls- 1.00 per call
    - 1001 to 2000 - 1.25 per call
    - Above 2000- 1.40 per call
  13. Perform Following:
    - Using Excel write sales data with columns product, month and sales. Write at least 5 records. Create Pivot Table chart and Report for the data.
    - Create a macro to change the name of worksheet as Macro Example, merge first three columns of first row and write heading as DATA in green color with yellow background
    - Link word document in excel worksheet to show the usage of linking and embedding.



	<b>MS - PowerPoint</b>
	14. Assume that you are going to give a presentation about Information Technology. (Choose some latest technologies). The presentation should have minimum 10 slides. Insert appropriate images wherever necessary. Use proper formatting, Diagrams and tables. Show the usage of action buttons, hyperlinks, and animations.

**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-I shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the FIRST Semester are as follows:

Code	Activity	Hours	Credits
BCD01611.1	Online Eligibility Exam (OLE)	1	0.5
BCD01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	
BCD01611.3	Online Certification Courses	-	



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

# BCA

## Data Science

### Batch 2019-22

# BCA- DATA SCIENCE



## Teaching Syllabus for II Sem.

# CORE THEORY SUBJECTS

Code: BCD02101

COMPUTER NETWORKS

3 Credits [LTP: 3-0-0]

## COURSE OUTCOME:

It is important for networking professionals to have a sound grounding in the basics of networking and with the networking technology being developed thick and fast, the professionals need to be updated of them at all times. The focus of this unit is providing a background to the basics of networking and its underlying principles.

This course will explore the fundamentals of networking, the principle and purpose behind layered models, devices used in networks and their wireless connectivity and the ways to troubleshoot network related issues. The unit underpins the principles of networking and enables the learners to work towards taking up vendor certifications in the networking domain. To enable students to understand computer networking concepts, how they work, how they operate and the protocols, standards and the models associated with networking technology and their troubleshooting mechanisms.

## A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Networking Fundamentals	8
2.	Basics of Network Devices	7
3.	Basics of Network, Transport and Application Layers	7
4.	WAN Technology	7
5.	Network Operating Systems and Troubleshooting Network	7

## B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Networking Fundamentals</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Basics of Network &amp; Networking, Advantages of Networking, Types of Networks</li><li>• Network Terms- Host, Workstations, Server, Client, Node</li><li>• Types of Network Architecture- Peer-to-Peer &amp; Client/Server, Workgroup Vs. Domain</li><li>• Network Topologies, Types of Topologies, Logical and physical topologies, selecting the Right Topology</li><li>• Types of Transmission Media, Communication Modes, Wiring Standards and Cabling- straight through cable, crossover cable, rollover cable, media connectors (Fibre optic, Coaxial, and TP etc.)</li><li>• Introduction of OSI model, Seven layers of OSI model, Functions of the seven layers, Introduction of TCP/IP Model, TCP, UDP, IP, ICMP, ARP/RARP, Comparison between OSI model &amp; TCP/IP model</li><li>• Overview of Ethernet Addresses</li><li>• Conclusion of the Unit</li></ul>
2.	<b>Basics of Network Devices</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Network Devices- NIC- functions of NIC, installing NIC, Hub, Switch, Bridge, Router, Gateways, And Other Networking Devices, Repeater, CSU/DSU, and modem</li><li>• Data Link Layer: Ethernet, Ethernet standards, Ethernet Components, Point-to-Point Protocol (PPP ),PPP standards, Address Resolution Protocol, Message format, transactions</li><li>• Wireless Networking: Wireless Technology, Benefits of Wireless Technology</li></ul>

	<ul style="list-style-type: none"> <li>• Types of Wireless Networks: Ad-hoc mode, Infrastructure mode</li> <li>• Wireless network Components: Wireless Access Points, Wireless NICs</li> <li>• wireless LAN standards: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, wireless LAN modulation techniques</li> <li>• wireless security Protocols: WEP, WPA, 802.1X, Installing a wireless LAN</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Basics of Network, Transport and Application Layers</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Layer: Internet Protocol (IP ), IP standards, versions, functions, IPv4 addressing, IPv4 address Classes, IPv4 address types, Subnet Mask, Default Gateway, Public &amp; Private IP Address, methods of assigning IP address, IPv6 address, types, assignment, Data encapsulation, The IPv4 Datagram Format, The IPv6 Datagram Format, Internet Control Message Protocol (ICMP ), ICMPv4, ICMPv6, Internet Group Management Protocol (IGMP ), Introduction to Routing and Switching concepts</li> <li>• Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports &amp; Sockets</li> <li>• Application Layer: DHCP, DNS, HTTP/HTTPS, FTP, TFTP, SFTP, Telnet, Email: SMTP, POP3/IMAP, NTP</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>WAN Technology</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• What Is a WAN?, WAN Switching, WAN Switching techniques Circuit Switching, Packet Switching etc., Connecting to the Internet : PSTN, ISDN, DSL, CATV, Satellite-Based Services, Last Mile Fiber, Cellular Technologies</li> <li>• Connecting LANs : Leased Lines, SONET/SDH, Packet Switching, Remote Access: Dial-up Remote Access, Virtual Private Networking, SSL VPN, Remote Terminal Emulation, Network security: Authentication and Authorization, Tunneling and Encryption Protocols, IPSec, SSL and TLS, Firewall, Other Security Appliances, Security Threats</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Network Operating Systems and Troubleshooting Network</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Operating Systems: Microsoft Operating Systems, Novell NetWare, UNIX and Linux Operating Systems, Macintosh Networking</li> <li>• Trouble Shooting Networks: Command-Line interface Tools, Network and Internet Troubleshooting, Basic Network</li> <li>• Troubleshooting : Troubleshooting Model, identify the affected area, probable cause, implement a solution, test the result, recognize the potential effects of the solution, document the solution</li> <li>• Using Network Utilities: ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat, Hardware trouble shooting tools, system monitoring tools</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr. No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1.	CCNA Cisco Certified Network Associate: Study Guide (With CD)	Todd Lamele	7th Edition (Paperback), Wiley India, 2011
2.	CCENT/CCNA ICND1 640-822 Official Cert Guide	Wendell Odom	3 Edition (Paperback), Pearson, 2013
3.	Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD)	Rick Graziani, Allan Johnson	Pearson, 2008
4	CCNA Exploration Course Booklet : Routing Protocols and Concepts	Cisco Networking Academy	Pearson, 2010

**COURSE OUTCOME:**

Object oriented programming is the most proven technique for developing reliable programs. It helps in increased productivity, reusability of code, decreases development time, and reduces cost of production to an extent. The cost of maintaining such systems have also considerably decreased. There are many languages which used the object oriented concepts and techniques. Some of them are C++, Java, Smalltalk, Objective-C, etc.

Java is a purely object oriented language. Systems/applications created using java programming language reduces the need for developing and maintain complex and space consuming applications. Java has a lot of advantages of being simple, robust, platform independent, etc. Nowadays java is also found in the mobile phones. This unit focuses on the concepts of object oriented programming language and the different constructs for creating applications in java.

To provide students with an understanding of the object oriented concepts which helps in the field of programming, management of data, etc. and of Java programming which helps to explore the object oriented nature of the language and the multi-platform versatility offered by it.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Object Oriented Programming	8
2	Basic Java Programming	10
3	Java Packages and Interfaces	10
3	Exceptions and I/O Handling	10
5	User Interface and Advanced Concepts	10

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Object Oriented Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Classes and Objects</li> <li>• Object Oriented Programming Concepts</li> <li>• Access Specifiers and Access Modifiers</li> <li>• Introduction to Java, Java Virtual Machine</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Basic Java Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Variables</li> <li>• Data Types</li> <li>• Control flow statements – if, else, switch, for, while</li> <li>• Arrays</li> <li>• Strings</li> <li>• Conclusion of the Unit</li> </ul>

<b>3.</b>	<b>Java Packages and Interfaces</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Java classes, Java methods, Packages, Interfaces</li> <li>• Java.util, java.io, java.net, java.sql, java.applet, etc</li> <li>• Collection Framework</li> <li>• Generics</li> <li>• Wrapper classes</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Exceptions and I/O Handling</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Errors and Exceptions</li> <li>• Exception handling</li> <li>• Streams, Readers and Writers</li> <li>• Programming with Files</li> <li>• Multithreaded programming</li> <li>• Networking – Socket Programming</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>User Interface and Advanced Concepts</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• User Interface Components</li> <li>• AWT</li> <li>• Swing</li> <li>• Event Handling</li> <li>• Layouts, Forms</li> <li>• Applets</li> <li>• Annotations</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1	Java Complete Reference	Herbert Schildt	TMH
2	SAMS teach yourself Java-2	Rogers Cedenhead and Leura Lemay	3rd Edition, Pub. Pearson Education.



**COURSE OUTCOME:**

A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently. Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks. In this course the student will be learning about different data structures and their applications.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Data structures	7
2	Searching and Sorting	7
3	Stack and Queue	8
4	Linked List	7
5	Tree Graphs and their Applications	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Data structures</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition,</li> <li>• Classification of data structures: primitive and non-primitive</li> <li>• Elementary data organization</li> <li>• Time and space complexity of an algorithm (Examples), String processing.</li> <li>• Definition of dynamic memory allocation</li> <li>• Accessing the address of a variable</li> <li>• Declaring and initializing pointers -</li> <li>• Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: malloc(), calloc(), free() and realloc().</li> <li>• Recursion – Definition, advantages, Writing Recursive programs – Binomial coefficient, Fibonacci, GCD.</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Searching and Sorting</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Basic Search Techniques</b> - Sequential search, Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search.</li> <li>• <b>Sorting:</b> General background and definition - Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort</li> <li>• Conclusion of the Unit</li> </ul>
3.	<b>Stack, and Queue</b>

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Stack – Definition</li> <li>• Array representation of stack</li> <li>• Operations on stack: Infix, prefix and postfix notations</li> <li>• Conversion of an arithmetic expression from Infix to postfix</li> <li>• Applications of stacks.</li> <li>• Definition of queue</li> <li>• Array representation of queue</li> <li>• Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue,</li> <li>• Operations on all types of Queues</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Linked List</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition of linked list</li> <li>• Components of linked list</li> <li>• Representation of linked list</li> <li>• Advantages and Disadvantages of linked list</li> <li>• Types of linked list: Singly linked list, doubly linked list, Circular linked list</li> <li>• Operations on singly linked list: creation, insertion, deletion, search and display</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Tree, Graphs and their Applications</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition : Tree</li> <li>• Binary tree, Complete binary tree, Binary search tree</li> <li>• Heap</li> <li>• Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node</li> <li>• Binary tree: Array representation of tree, Creation of binary tree.</li> <li>• Traversal of Binary Tree: Preorder, Inorder and postorder.</li> <li>• Graphs</li> <li>• Application of Graphs</li> <li>• Depth First search, Breadth First search.</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr.No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1	Data Structures and Algorithm Analysis in C	Weiss	II Edition, Pearson Education, 2001
2	Schaum's outline series Data structures	Lipschutz	Tata McGraw-Hill
3	Data Structures and program designing using 'C'	Robert Kruse	Pearson
4	Programming in ANSI C.	E. Balaguruswamy	Tata McGraw-Hill
5	Data Structures Using C	Bandyopadhyay	Pearson Education, 1999
6	Data Structures Using C	Tenenbaum	Pearson Education, 200
7	Introduction to Data Structures in C	Kamthane	Pearson Education 2005
8	Practical approach to Data Structures	Hanumanthappa M	Practical approach to Data Structures
9	Aaron Data Structures using C and C++	Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron	Pearson Education

**COURSE OUTCOME:**

The course provides an overview of the Linux Operating System, geared toward new users as an exploration tour and getting started guide. This unit provides examples to help the learners get a better understanding of the Linux system. The unit also provides the guidelines for the learners to take up vendor certifications.

The unit explores the basics of Linux, the underlying management of the Linux operating system and its network configuration. The complete system services of Linux is explained along with the troubleshooting.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to Operating System	7
2.	Process Management – Processes and Threads	8
3.	Process Management – Synchronization and Deadlocks	8
4.	Storage Management	6
5.	Protection and Security	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Operating System</b>
	<ul style="list-style-type: none"> <li>Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.</li> <li>History of UNIX, Features &amp; Benefits, Versions of UNIX, Features of UNIX File System,, Commonly Used Commands and getting Started (Login/Logout) .</li> <li>Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces</li> </ul>
2.	<b>Process Management – Processes and Threads</b>
	<ul style="list-style-type: none"> <li>Processes: Process concept, Process scheduling, Co-operating processes, Inter process Communication</li> <li>Threads: Introduction to Threads, Single and Multi-threaded processes</li> <li>CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling,</li> <li><b>Unix Process Management</b> The Structure of Processes: Process States and Transitions - Layout of system memory - Context of a process.</li> <li>Process Control: Process Creation – Signals – Process Termination – Invoking other programs – PID &amp; PPID – Shell on a Shell.</li> </ul>
3.	<b>Process Management – Synchronization and Deadlocks</b>
	<ul style="list-style-type: none"> <li>Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions,</li> <li>Monitors, OS Synchronization, Atomic Transactions. Deadlocks: System Model,</li> <li>Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock</li> </ul>

	Avoidance, Deadlock Detection, Recovery from Deadlock.
<b>4.</b>	<b>Storage Management</b>
	<ul style="list-style-type: none"> <li>• Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.</li> <li>• Virtual Memory Management: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing,</li> <li>• File-System Interface: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.</li> <li>• File-System Implementation: File-System structure. Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery.</li> <li>• Disk Management: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation</li> <li>• <b>The Unix File System</b></li> <li>• Inodes - Structure of a regular file – Directories - Conversion of a path name to an inode - Super block - Inode assignment to a new file - Allocation of disk blocks.</li> <li>• System calls for the file System: Open – Read - Write - Lseek – Close - File creation - Creation of special files - Changing directory and root - changing owner and mode – stat and fstat - pipes - Dup - Mounting and Un mounting file systems - Link and Un link.</li> </ul>
<b>5.</b>	<b>Protection and Security</b>
	<ul style="list-style-type: none"> <li>• Protection: Goals of Protection, Domain of Protection, Security: Security Problem,</li> <li>• User Authentication, One – Time Password, Program Threats, System Threats,</li> <li>• UNIX SYSTEM ADMINISTRATION Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, managing user accounts-adding &amp; deleting users, changing permissions and ownerships,</li> <li>• Creating and managing groups, modifying group attributes, temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security &amp; Permissions, becoming super user using su.</li> <li>• Getting system information with uname, host name, disk partitions &amp; sizes, users, kernel, installing and removing packages with rpm command</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Book	Author	Publication
1.	Operating System Concepts and design	Milan Milonkovic,	II Edition, McGraw Hill 1992.
2.	Operation System Concepts	Tanenbaum	2 <sup>nd</sup> Edition, Pearson Education.
3.	Operating System	William Stallings	4 <sup>th</sup> Edition, Pearson Education.
4.	Guide to UNIX Using LINUX	Jack Dent Tony Gaddis, Vikas	Thomson Pub. House Pvt. Ltd. 2010

# Practical

Code: BCD02205

COMPUTER NETWORKS LAB

2 Credits [LTP: 0-0-4]

## A. List of Programs

Part A	
	1 Implementation of TCP/IP protocol – I
	2 Implementation of TCP/IP protocol - II
	3 Troubleshooting Scenarios Network - I
	4 Troubleshooting Scenarios Network - II
	5 Router – Configuration - I
	6 Router – Configuration - II
Part B	
	7 Router – Configuration - III
	8 Configuration of IP Address for a Router – I
	9 Configuration of IP Address for a Router - II
	10 Setting up of Passwords – I
	11 Setting up of Passwords – II
	12 Setting up of Passwords - III

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. A. Write a program to print “Hello World” in Java.  . B. Write a program to add two numbers  C. Write a program to demonstrate the different access specifiers</li> <li>2. A. Write a program to demonstrate inheritance, abstraction, encapsulation and Polymorphism.  B. Write a program to find the factorial of n numbers  C. Write a program to calculate Fibonacci series  D. Write a program to add n numbers and series</li> <li>3. A. Write a program to create an array and store elements into the array.  B. Write a program to find the sum of elements in an array  C. Write a program to demonstrate switch case, if, if-else and for loop.</li> <li>4. A. Write a program to demonstrate the working of methods.  B. Write a program which has four methods – add(), subtract(), multiply() and divide() and demonstrate a simple console calculator.  C. Write a program to accept command line arguments and display them to the user  Write a program which uses different packages</li> <li>5. A. Write a program to create a package.  B. Write a program to handle different exceptions</li> <li>6. A. Write a program to demonstrate try-catch, throw and throws.  B. Write a program to accept input from the user using streams</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Write a program to read a file</li> <li>8. Write a program to write into a file</li> <li>9. A. Write a program to demonstrate client server communication (socket programming)  B. Write a program to create threads and manipulate them</li> <li>10. Write a program to create a user interface to check user authentication.</li> <li>11. Write a program to create a registration form and save the details into a file</li> <li>12. Write a program to create a small animation using applets</li> </ol>

**A. List of Programs:**

Part A	
	<ol style="list-style-type: none"><li>1. Use a recursive function to find<ol style="list-style-type: none"><li>(a) GCD of two numbers.</li><li>(b) Use a recursive function to find the Fibonacci series.</li></ol></li><li>2. Use pointers to find the length of a string and to concatenate two strings.</li><li>3. Perform the following:<ol style="list-style-type: none"><li>(a) Use pointers to copy a string and to extract a substring from a given a string.</li><li>(b) Use a recursive function for the towers of Hanoi with three discs.</li></ol></li><li>4. Perform the following:<ol style="list-style-type: none"><li>(a) Insert an integer into a given position in an array.</li><li>(b) Deleting an integer from an array.</li></ol></li><li>5. Write a program to create a linked list and to display it.</li><li>6. Perform the following:<ol style="list-style-type: none"><li>(a) Write a program to sort N numbers using insertion sort.</li><li>(b) Write a program to sort N numbers using selection sort.</li></ol></li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Inserting a node into a singly linked list.</li><li>8. Deleting a node from a singly linked list.</li><li>9. Pointer implementation of stacks.</li><li>10. Pointer implementation of queues.</li><li>11. Creating a binary search tree and traversing it using in order, preorder and post order.</li><li>12. Sort N numbers using merge sort.</li></ol>



# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCD02108**

**ENGLISH-II**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

After studying the building blocks of English like Grammar Essentials, Sentence structure and Professional writing skills, students will now learn about few advanced Grammar like Voice, Tenses, Communication concepts and so on. In the second Unit which is Advanced Grammar, they are taught concepts in Synonyms, Idioms and Phrases and Antonyms all of which give a little color to the language. Students will learn about report writing, review writing and more interesting topics in communication, which is the final topic.

## **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Comprehension	8
2.	Short Paragraph Writing	7
3.	Review writing	7
4.	Writing for Social Media	7
5.	Presentations & Miscellaneous	7

## **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Comprehension</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Comprehension passage 1</li><li>• Comprehension passage 2</li><li>• Comprehension passage 3</li><li>• Comprehension passage 4</li><li>• Comprehension passage 5</li></ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"><li>• Conclusion of Unit</li></ul>
2.	<b>Short Paragraph Writing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Topic 1</li><li>• Topic 2</li><li>• Topic 3</li><li>• Topic 4</li><li>• Topic 5</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences</li><li>• Conclusion of Unit</li></ul>
3.	<b>Review writing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li></ul> <p>Topic 1 – Book [can be a story review for average students] Topic 2 - Movie review [different kinds of movies can be suggested too for practice]</p>

	<p>Topic 3 – Another Movie review  Topic 4 – Hotel / Café / Recreations centre Review  Topic 5 – Electronic Gadget Review (Laptop/smart phone / speakers/ PSP/ etc.)</p> <p>What is a review? How to write a review. Different types of reviews.</p> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Writing for Social Media</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Writing for social media: Facebook, Inked-in</li> <li>• Points to remember while writing on the social media. How to write Profile summary.</li> <li>• What is a blog? How to write a blog?</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Presentations &amp; Miscellaneous</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Formal Informal</li> <li>• Debate</li> <li>• Discussions</li> <li>• Pick &amp; Speak</li> </ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <p>Usage of Phrases &amp; Idioms</p> <p>Revision of English I &amp; II</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Practical English Usage	Michel Swan	Oxford University Press
2.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English		South Asian edition), Cambridge University Press
3.	Learn Correct English: Grammar, Usage and Composition	Shiv K. Kumar & Hemalatha Nagarajan	Pearson, New Delhi, India
4.	Grammar of the Modern English Language	Sukhdev Singh & Balbir Singh	Foundation Books, New Delhi
5.	Communicative English for Engineers and Professionals	Nitin Bhatnagar and Mamta Bhatnagar	Pearson( New Delhi)
6.	Communicative grammar and composition	Rajesh.K.Lidiya	Oxford Univ Press, New Delhi.

<b>Code: BCD02209</b>	<b>LIFE &amp; CAREER SKILLS-I</b>	<b>1 Credit [LTP: 0-0-2]</b>
-----------------------	-----------------------------------	------------------------------

• **LIST OF ACTIVITIES**

<b>Part - A</b>	
1.	Self-Introduction & knowing your environment
2.	GOAL Setting & Planning
3.	Time Management & Team Work
4.	Personal Grooming and Body language
5.	Etiquettes (Personal, Social, Professional & Corporate) etiquettes
6.	Reading skills: General & Technical Articles
<b>Part - B</b>	
7.	Listening Skills: Analysis of videos by famous Personalities
8.	Writing Skills: Picture perception & Story Making by jumbled words
9.	Speaking Skills: Extempore, JAM & Me against myself
10.	Role Plays
11.	Resume Writing
12.	Group Discussion

**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-II shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the SECOND Semester are as follows:

Code	Activity	Hours	Credits
BCD02610.1	Online Eligibility Exam (OLE)	1	0.5
BCD02610.2	Campus Recruitment Training (CRT) -Introduction to Public Speaking	3	
BCD02610.3	Online Certification Courses	-	

# POORNIMA UNIVERSITY, JAIPUR

## BCA (ITIMS & CT) First Year

### Teaching Scheme for First Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCT01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCT01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCT01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCT01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCT01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BCT01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCT01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCT01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCT01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCT01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCT01611.3	Online Certification Courses	-	-	-	-	-	-			
	Total	20	1	14				25.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (ITIMS & CT) First Year

### Teaching Scheme for Second Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCT02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCT02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCT02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCT02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCT02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCT02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCT02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCT02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BCT02610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (ITIMS & CT) Second Year

### Teaching Scheme for Third Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCT03101	Advanced Java Programming	4	-	-	40	60	100	4	Theory	Core Course
BCT03102	Database Management System	3	-	-	40	60	100	3	Theory	Core Course
BCT03103	Object Oriented Analysis & Design	3	-	-	40	60	100	3	Theory	Core Course
BCT03204	Advance Java Programming Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT03205	Database Management System Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT03106.1	Information Security Fundamentals	3	-	-	40	60	100	3	Theory	Departmental Elective
BCT03106.2	Security Threats and Trends				40	60	100		Theory	Departmental Elective
BSE03151	Fundamentals of IoT and its Applications	3	-	-	40	60	100	3	Theory	Open Elective
BSE03152	Introduction to Animation and Photography				40	60	100		Theory	Open Elective
BSE03153	Python Programming				40	60	100		Theory	Open Elective
BSE03154	Blockchain Fundamentals				40	60	100		Theory	Open Elective
BSE03155	Big Data Analytics				40	60	100		Theory	Open Elective
BSE03156	Introduction to Digital Marketing				40	60	100		Theory	Open Elective
BCT03313	Summer Project	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCT03414	Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCT03215	Personality Development	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT03216	Life & Career Skills-II	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT03617	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT03617.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BCT03617.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCT03617.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>18</b>	<b>0</b>	<b>17</b>				<b>24.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (ITIMS & CT) Second Year

### Teaching Scheme for Fourth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Marks			
BCT04101	Principles of Virtualization	3	-	-	40	60	100	3	Theory	Core Course
BCT04102	Network Administration	3	-	-	40	60	100	3	Theory	Core Course
BCT04103	Installation and Configuration of Server	4	-	-	40	60	100	4	Theory	Core Course
BCT04204	Principles of Virtualization Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT04205	Network Administration Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT04106.1	Cloud Technology	3	-	-	40	60	100	3	Theory	Departmental Elective
BCT04106.2	Storage & Datacenter				40	60	100		Theory	Departmental Elective
	Annexure 1	3	-	-	40	60	100	3	Theory	Open Elective (University Level) ANYONE
BCT04407	Industrial Training Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCT04108	Logical Reasoning and Thinking	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT04209	Life & Career Skills-III	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT04610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT04610.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BCT04610.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCT04610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>18</b>	<b>0</b>	<b>15</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>33</b>								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.



# POORNIMA UNIVERSITY, JAIPUR

## BCA (ITIMS & CT) Third Year

### Teaching Scheme for Fifth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCT05101	Cloud Deployment	4	-	-	40	60	100	4	Theory	Core Course
BCT05102	Cloud Web Services	4	-	-	40	60	100	4	Theory	Core Course
BCT05103	Linux Server Administration	4	-	-	40	60	100	4	Theory	Core Course
BCT05204	Cloud Deployment Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT05205	Cloud Web Services Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT05206	Linux Server Administration Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT05107.1	Infrastrcture Automation	3	-	-	40	60	100	3	Theory	Departmental Elective
BCT05107.2	Cloud Migration				40	60	100		Theory	Departmental Elective
BCT05208	Life & Career Skills-IV	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT05609	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT05609.1	Campus Recruitment Training/OLE	3	-	-	-	-	-			
BCT05609.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCT05609.3	Online Certification Courses	-	-	-	-	-	-			
	Total	18	0	15				22.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

## POORNIMA UNIVERSITY, JAIPUR

### BCA (ITIMS & CT) Third Year

#### Teaching Scheme for Sixth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCT06301	Major Project / Internship	-	-	12	60	40	100	12	Practical	Skill Enhancement Course
BCT06602	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	-	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT06602.1	Campus Recruitment Training/OLE	-	-	-	-	-	-	-		
BCT06602.2	Non Syllabus Project (NSP)	-	-	-	-	-	-	-		
BCT06602.3	Online Certification Courses	-	-	-	-	-	-	-		
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>12</b>				<b>12</b>		
	<b>Total Teaching Hours</b>	<b>12</b>								

Summary Sheet for Teaching Scheme (Credits)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Total Credits
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	13	4	-	-	6	1	-	1	0.5	25.5
II	13	6	-	-	3	-	-	1	0.5	23.5
III	10	4	3	3	-	2	-	2	0.5	24.5
IV	10	4	3	3		1	-	2	0.5	23.5
V	12	6	3	-	-	-	-	1	0.5	22.5
VI	-	-	-	-	-	12	-	-	-	12
Total	58	24	9	6	9	16		7	2.5	131.5

Summary Sheet for Teaching Scheme (Subjects)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Remarks
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	4	2	-	-	2	1	-	1	3	-
II	4	3	-	-	1	-	-	1	3	-
III	3	2	2	6	-	2	-	2	3	School Level Open Elective
IV	3	2	2	25	-	1	-	2	3	University Level Open Elective
V	3	3	2	-	-	-	-	1	3	-
VI	-	-	-	-	-	1	-	-	3	Internship for 6 months
Total	17	12	6	31	3	5	-	7	18	99

## Annexure - I

### Open Elective Courses at University Level in IV Semester (For All Schools)

Sr. No.	Course Code	Course Name	Teaching Department
1	BOE04111	Industrial Psychology and Sociology	Mechanical Engineering
2	BOE04112	Total Quality Management	Mechanical Engineering
3	BOE04113	Project Management	Mechanical Engineering
4	BOE04114	Logistics and Supply Chain Management	Mechanical Engineering
5	BOE04115	Basics of Petro Industry	Mechanical Engineering
6	BOE04116	Nano Science and Technology	Electrical & Electronics Engineering
7	BOE04117	Non Conventional Energy Sources	Electrical & Electronics Engineering
8	BOE04118	Introduction to Soft Computing	Electrical & Electronics Engineering
9	BOE04119	IPR and Patents	Electrical & Electronics Engineering
10	BOE04120	Artificial intelligence	Electrical & Electronics Engineering
11	BOE04121	E-commerce	Computer Engineering
12	BOE04122	Management Information System (MIS)	Computer Engineering
13	BOE04123	IT Act and Cyber Law	Computer Engineering
14	BOE04124	Python	Computer Engineering
15	BOE04125	Basics of UX/UI Design	Computer Engineering
16	BOE04126	Values and Professional Ethics	SMC
17	BOE04127	Digital Marketing	SMC
18	BOE04128	Business Research	SMC
19	BOE04129	Basics of Economics	SMC
20	BOE04130	Entrepreneurship	SMC
21	BOE04131	Essentials of Management	SMC
22	BOE04132	Organizational Behaviour& Cyber Law	SMC
23	BOE04133	Disaster Management	SPA
24	BOE04134	Foreign Language French & Japanese	SPA
25	BOE04135	Creative Thinking	SDA



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE & ENGINEERING

# BCA

ITIMS & CT  
Batch 2019-22

## BCA- ITIMS & CT



Teaching Scheme for  
BCA – (ITIMS & CT)  
Detailed Syllabus for  
I & II SEM

POORNIMA UNIVERSITY, JAIPUR										
BCA (ITIMS & CT) First Year (2019-2022)										
Teaching Scheme for First Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCT01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCT01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCT01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCT01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCT01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BCT01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCT01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCT01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCT01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCT01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCT01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

POORNIMA UNIVERSITY, JAIPUR										
BCA (ITIMS & CT) First Year (2019-2022)										
Teaching Scheme for Second Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCT02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCT02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCT02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCT02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCT02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCT02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCT02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCT02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCT02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCT02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCT02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BCT02610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>						<b>5</b>		





**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**

**ITIMS & CT**

**Batch 2019-22**

**BCA- ITIMS & CT**



**Teaching Syllabus  
for  
I Sem.**



# CORE THEORY SUBJECTS

Code: BCT01101

PROGRAMMING FUNDAMENTALS USING C

3 Credits [LTP: 3-0-0]

## COURSE OUTCOME:

Even with the introduction of several high level languages and frameworks, the development of procedural codes is important in several commercial app developments. The object oriented platforms and event driven systems use procedural languages for coding integral command content.

C is an important procedural language and was developed initially to write the UNIX operating system. UNIX operating system, C compiler and all UNIX application programs are written in C. C is popular because, it is easy to learn, produces efficient programs, can handle low-level activities, and can be compiled on a variety of platforms.

This unit focuses on all the basic concepts, syntax and constructs of the C language. For students, who are new to programming, this unit can be considered as the starting point before taking up any other programming oriented units. The students will be implementing the concepts explained here to create simple to complex programs.

## A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Overview of Programming	6
2.	Fundamentals of C programming	6
3.	Advanced programming techniques	8
4.	Dynamic data structures in C	8
5.	Additional features	8

## B. DETAILED SYLLABUS

Unit	Unit Details
1.	Overview of Programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Introduction to computer based problem solving</b>, Program design and implementation issues- Flowcharts &amp; Algorithms, Top down design &amp; stepwise refinement</li><li><b>Programming environment</b> – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters.</li><li>Conclusion of the Unit</li></ul>
2.	Fundamentals of C programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Overview of C</b>, Data Types, Constants &amp; Variables, Operators &amp; Expressions</li><li><b>Control constructs</b>-if then, for, while, <b>Arrays</b>- single &amp; multidimensional arrays</li><li><b>Functions</b>-fundamentals – general form, function arguments, return value</li><li><b>Basic I/O</b>-formatted and Unformatted I/O, <b>Advanced features</b>- Type modifiers and storage class specifies for data types, Bit operators, Operator, &amp;operator, * operator, Type casting, type conversion.</li><li>Conclusion of the Unit</li></ul>
3.	Advanced programming techniques

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Control constructs</b>- Do while, Switch statement, break and continue, exit() function, go to and label</li> <li>• <b>Scope rules</b>- Local &amp; global variables, scope rules of functions</li> <li>• <b>Functions</b>-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi.</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Dynamic data structures in C</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Pointers</b>- The &amp; and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function returning pointers</li> <li>• <b>Structures</b>- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures</li> <li>• <b>Unions</b> – Declaration, uses, enumerated data-types, typedef.</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Additional features</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>File Handling</b> – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf</li> <li>• <b>C Preprocessor</b>- #define, #include, #undef, Conditional compilation directives.</li> <li>• <b>C standard library and header files</b>: Header files, string functions, mathematical functions, Date and Time functions.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Let us C, 6 <sup>th</sup> Edition	Yashwant Kanetka	PBP Publication
2.	The C programming Language	Richie and Kenninghan	BPB Publication,2004
3.	Programming in ANSI C 3 <sup>rd</sup> Edition, 2005	Balaguruswamy	Tata McGraw Hill

### COURSE OUTCOME:

- To understand and the use of basic concepts of Computer components.
- To understand the concept of memory hierarchy and the use of various input-output devices.
- To understand the various computer languages, operating system functions and the application of number systems.
- To understand the basic Computer Networking principles and the applications of WWW, multimedia and the usage of electronic mail.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Register Transfer and Micro-operation	8
2.	Basic Computer Organization	8
3.	Micro Programmed Control Unit	8
4.	Computer Arithmetic	6
5.	Modes of Data Transfer and Memory Organization	6

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Register Transfer and Micro-operation</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer.</li> <li>• Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor,</li> <li>• Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Basic Computer Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Instruction Codes, Computer Registers: Common bus system, Computer Instructions:</li> <li>• Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions.</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Micro Programmed Control Unit</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines.</li> <li>• Design of Control Unit, Central Processing Unit: Introduction, General Register Organization,</li> <li>• Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes.</li> <li>• Conclusion of Unit</li> </ul>
4.	<b>Computer Arithmetic</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Addition and Subtraction,</li> </ul>

	<ul style="list-style-type: none"> <li>• Multiplication Algorithms (Booth algorithm), Division Algorithms,</li> <li>• Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors.</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Modes of Data Transfer and Memory Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Modes of Data Transfer: Priority Interrupt, Direct Memory Access,</li> <li>• Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory,</li> <li>• Associative Memory, Cache Memory, Virtual Memory</li> <li>• Conclusion of unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Computer System Architecture	Morris Mano	PHI
2.	Computer Organization and Architecture	William Stallings	PHI
3.	Digital Computer Electronics:	An Introduction to Microcomputers by Malvino	TMH

**COURSE OUTCOME:**

Web Technology has revolutionized mankind and entirely changed the way we look at things. Banking, Education, Retailing, Manufacturing and Research are some of the things that have undergone major transformations due to influence from web development. By adding more features, increasing the scope and reach of industries, making it available to users irrespective of their geography, web has captivated the human minds. Learning web technology is one of the top priorities for every computer enthusiast in order to better understand its working and scope. Students will understand the fundamental working technology behind web development and HTML. They will be taught concepts like JS, HTML5 thus making them capable of web development.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to the Internet and the World Wide Web	8
2.	HTML & CSS	8
3.	XML and HTML5, CSS3	8
4.	PHP Server side scripting	6
5.	Practical website development	6

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to the Internet and the World Wide Web</b>
	<ul style="list-style-type: none"> <li>Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture</li> <li>Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development.</li> <li>HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST</li> </ul>
2.	<b>HTML &amp; CSS</b>
	<ul style="list-style-type: none"> <li>Introduction to Html, Html Document structure, Html Editors, Html element/tag &amp; attributes, Designing simple page - Html tag, Head tag, Body tag;</li> <li>More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.</li> <li>Introduction to CSS, Syntax, Selectors ,Embedding CSS to Html, Formatting fonts, Text &amp; background colour, Inline styles, External and Internal Style Sheets, Borders &amp; boxing</li> </ul>
3.	<b>XML and HTML5, CSS3</b>
	<ul style="list-style-type: none"> <li>Introduction to XML, Difference b/w Html &amp; XML, XML editors, XML Elements &amp; Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.</li> <li>Introduction to HTML5, CSS3, New features, Local storage, Web Sockets, Server events, Canvas, Audio &amp; Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers</li> </ul>
4.	<b>PHP Server side scripting</b>
	<ul style="list-style-type: none"> <li>Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays Strings,</li> <li>Environment &amp; environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.</li> </ul>
5	<b>Practical website development</b>

	<ul style="list-style-type: none"> <li>• Commonly used Web Servers and browsers, Setting up a server and domain name, website types and structures,</li> <li>• Web authoring tools, Web hosting, website maintenance, generating traffic to your website.</li> </ul>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Book	Author	Publication
<b>a. Reference Books</b>			
1.	Practical Web Design for Absolute Beginners	Adrian W. West	Apress 2016
2.	Introducing Web Development	Jorg Krause	Apress 2017
3.	HTML & CSS: The Complete Reference	Thomas Powell	McGraw Hill, Fifth Edition, 2010
4.	Creating a Website: The Missing Manual	Mathew Macdonald. O'Reilly	3rd Edition

**COURSE OUTCOME:**

- To learn fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skewness and kurtosis.
- To solve problems on theory of probability, linear programming problems, transportation, assignment and game problems.
- To learn important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications..

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Basic Statistics	8
2.	Probability Distribution	10
3.	Regression	10
4.	Sample introduction, Sampling	10
5.	T-Test	10

**B. DETAILED SYLLABUS**

Unit	Unit Details Regression
1.	<b>Basic Statistics</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Preparing Frequency Distribution Table and Cumulative frequency, Measure of Central Tendency, Types: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.</li> <li>• Measure of Dispersion: Range, Quartile Deviation, mean deviation, Coefficient of mean Deviation, Standard Deviation</li> <li>• Moments: Moments About mean, Moments about any point, Moment about origin, Moment about mean in terms of moment about any point, Moment about any point in terms of Moment about mean.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Probability Distribution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Random Variable- Discrete Random and Continuous Random variable, Probability Distribution of a Random Variable, Mathematical Expectation</li> <li>• Types: Binomial, Poisson, Normal Distribution, Mean and Variance of Binomial, Poisson, and Normal Distribution.</li> <li>• Correlation: Introduction, Types, Properties, Methods of Correlation: Karl Pearson's Coefficient of Correlation, Rank Correlation and Concurrent Deviation method, Probable error</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Regression</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Aim of Regression Analysis, Types of Regression Analysis, Lines of Regression, Properties of Regression Coefficient and Regression Lines, Comparison with Correlation.</li> </ul>

	<ul style="list-style-type: none"> <li>• Curve Fitting: Straight Line, Parabolic curve, Geometric Curve and Exponential Curve Baye's Theorem in Decision Making, Forecasting Techniques</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Sample introduction, Sampling</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Meaning, methods of Sampling, Statistical Inference: Test of Hypothesis, Types of hypothesis, Procedure of hypothesis Testing, Type I and Type II error,</li> <li>• One Tailed and two tailed Test, Types of test of Significance: Test of significance for Attribute-Test of No. of success and test of proportion of success</li> <li>• Test of significance for large samples - Test of significance for single mean and Difference of mean, Test of significance for small samples</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>T-Test</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Test the significance between the mean of a random sample, between the mean of two independent samples.</li> <li>• Chi square Test, ANOVA: Meaning, Assumptions, One way classification, ANOVA Table for One-Way Classified Data</li> <li>• Conclusion of unit</li> </ul>

#### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Fundamentals of Applied statistics	Gupta S.P. and Kapoor	Sultan Chand & Sons, 1996.
2.	Introduction to Statistics	Graybill,	McGraw



# Practicals

Code: BCT01205

PROGRAMMING FUNDAMENTALS USING C LAB

2 Credits [LTP: 0-0-5]

## A. List of Programs

Part A	
	<ol style="list-style-type: none"><li>1. Find biggest number among 4 given numbers</li><li>2. Printing the reverse of an integer.</li><li>3. Printing the odd and even series of N numbers.</li><li>4. Input a string and find the number of each of the vowels appear in the string.</li><li>5. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li><li>6. Printing the reverse of a string.</li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Searching an element in an array using pointers.</li><li>8. Checking whether the given matrix is an identity matrix or not</li><li>9. Addition and subtraction of two matrices.</li><li>10. Multiplication of two matrices.</li><li>11. Print the following:</li><li>12. Reverse of an integer.</li><li>13. Odd and even series of N numbers.</li><li>14. Get a string and convert the lowercase to uppercase and vice--versa using getchar() and putchar().</li><li>15. Perform the following:</li><li>16. Input a string and find the number of each of the vowels appear in the string</li><li>17. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li></ol>

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. 1. Hello World Web Page               <ol style="list-style-type: none"> <li>a) Create a web page using basic HTML features like tags, attributes, elements and page title.</li> <li>b) How to install, and configure a web server</li> </ol> </li> <li>2. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) A more functional web page by making use of headings, paragraphs, lists, images and links.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Use different font styles.</li> <li>ii. Set background image for both the page and single elements on the page.</li> </ol> </li> </ol> </li> <li>3. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) Using textboxes, check boxes, radio buttons and submit buttons.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Control the repetition of image with background-repeat property.</li> <li>ii. Define style for links as a: link, b: active, c: hover, d: visited.</li> <li>iii. Add customized cursors for links.</li> </ol> </li> </ol> </li> <li>4. Create XMLHttpRequest and retrieve data from a text file and an XML file.</li> <li>5. Create the following webpage:               <ol style="list-style-type: none"> <li>a) Show the class timetable in a tabular format.</li> <li>b) Create a webpage using HTML to show your geolocation.</li> </ol> </li> <li>6. Create a webpage using HTML for audio and video player.</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Create a login registration form using PHP.</li> <li>8. Develop a PHP webpage to manipulating files such as creating, writing, reading and uploading.</li> <li>9. Create a dynamic webpage by using PHP conditional operators, loops and strings to create an dynamic timetable page.</li> <li>10. Develop a PHP web application track the user as how many times visited and last visited time</li> <li>11. Develop a static website – I.</li> <li>12. Develop a dynamic website –II</li> </ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCT01107**

**ENGLISH-I**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

### **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Everyday Conversations	8
2.	Asking for..	7
3.	Reporting/ Describing	7
4.	Meeting People	7
5.	Expressing & Talking about....	7

### **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Everyday Conversations</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Introducing self / others</li><li>• Weather</li><li>• Classroom</li><li>• Asking about facilities around</li><li>• Describing a person / thing</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
2.	<b>Asking for..</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Help/ Suggestion/ ideas</li><li>• Clarification/ Directions</li><li>• Time/ food</li><li>• Advice</li><li>• Uses</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
3.	<b>Reporting/ Describing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Incidences</li><li>• Personalities</li><li>• Experiences</li><li>• Wants/Needs</li><li>• Intentions</li></ul>

	<ul style="list-style-type: none"> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Meeting People</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Greetings</li> <li>• Starting the Conversation</li> <li>• Small talks</li> <li>• Closing the conversation</li> <li>• Points to cover: Vocabulary, Grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheet</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Expressing &amp; Talking about....</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Happiness/Displeasure</li> <li>• Preferences</li> <li>• Doubts</li> <li>• Views</li> <li>• Unawareness</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Interests</li> <li>• Different Cultures, Clothes, cars, institutes, situations</li> <li>• Schedules, prices</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Speak Now Level I & II	Jack C Richards & David Bohlke	Oxford Press
2.	Business Benchmark, Level –	Guy Brook-Hart	Upper Intermediate by Cambridge University Press
3.	Practical English Usage	Michel Swan	Oxford University Press
4.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English	Ronald Carter, Michael McCarthy	(South Asian edition), Cambridge University Press

**COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Communication Process	6
2.	Types of Communication & Barriers to communication	5
3.	Listening Skills & Reading Skills	5
4.	Conversation Skills	4
5.	Telephone Etiquette	4

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Communication Process</b>
	<ul style="list-style-type: none"> <li>What is communication?</li> <li>The communication model</li> <li>Elements of communication</li> <li>Importance of effective communication skills in the business world</li> <li>Components of Communication</li> <li>Process, practicing effective communication, good communication Vs effective communication, styles of communication, intercultural communication skills- need for attitude change and benefits</li> </ul>
2.	<b>Types of Communication &amp; Barriers to communication</b>
	<ul style="list-style-type: none"> <li>Verbal Communication</li> <li>Non Verbal Communication</li> <li>Written Communication</li> <li>Do's and don'ts of each type</li> <li>Barriers to effective communication and how to overcome them</li> <li>Interaction of verbal and non-verbal communication, talents of a corporate communicator, silence- merits and limitations of each type</li> </ul>
3.	<b>Listening Skills &amp; Reading Skills</b>
	<ul style="list-style-type: none"> <li>What is listening</li> <li>Various types of listening – Active, passive, selective, listening and note taking, listening and comprehending, listening to speak,</li> <li>Principles of good listening</li> <li>Techniques to develop effective listening skills</li> <li>Reading Skills- skimming, scanning and inferring- common reading techniques,</li> <li>Practicing smart reading.</li> </ul>
4.	<b>Conversation Skills</b>
	<ul style="list-style-type: none"> <li>Importance of conversation skills</li> <li>Features of a good conversation</li> <li>Tips to improve Conversation skills</li> </ul>

	<ul style="list-style-type: none"> <li>• Importance of questioning skills, techniques to ask right questions- role play situations to practice the same, discussing issues (social, political and cultural), formal and informal conversation</li> </ul>
<b>5.</b>	<b>Telephone Etiquette</b>
	<ul style="list-style-type: none"> <li>• Basic rules of telephone etiquette- formal vs. informal; tone, pitch and vocabulary related to formal ways of speaking over the phone, leaving voice messages; practice sessions (role plays)</li> <li>• <b>Persuasive communication</b> :What is persuasive communication, different techniques of persuasive communication, How to negotiate using persuasive communication, the act of negotiation, negotiation style and their contexts, fundamentals of negotiation, common hurdles in negotiation and how to overcome them</li> </ul>

**COURSE OUTCOME:**

The student would be able:

- To acquire the knowledge of environmental studies and understand the principles of ecology and environmental issues.
- To distinguish & analyze different water treatment methods and conservation of water.
- To design innovative ideas for controlling air, noise & soil pollution.
- To develop deeper knowledge in the problems and possibilities of waste management from a national and global perspective and demonstrate socio-economic skills for sustainable development.
- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Environmental studies	6
2.	Ecology	8
3.	Natural & Biological Resources	8
4.	Social Issues	7
5.	Environmental Pollution	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1	<b>Environmental studies</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Scope</li> <li>• Importance &amp; components</li> <li>• Natural and Manmade.</li> <li>• Conclusion of the Unit</li> </ul>
2	<b>Ecology</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Concept</li> <li>• Structure and Functions of Ecosystem</li> <li>• Biotic and A biotic Factors</li> <li>• Environmental Interactions.</li> <li>• Defining Communication Theories.</li> <li>• Conclusion of the Unit</li> </ul>
3	<b>Natural &amp; Biological Resources</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Plants</li> <li>• Animal and Microorganisms.</li> <li>• Conclusion of the Unit</li> </ul>
4	<b>Social Issues</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Human Population</li> <li>• Environment</li> </ul>

	<ul style="list-style-type: none"> <li>• Conclusion of the Unit</li> </ul>
<b>5</b>	<b>Environmental Pollution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Cause</li> <li>• Effects</li> <li>• Types and Control Measures</li> <li>• Conservation and preservation of Environment.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Reference Book	Author	Edition	Publication
1.	Environmental Studies	Erach Barucha	Latest	UGC
2.	Environmental Studies	Benny Joseph	Latest	Tata McgrawHill
3.	Environmental Studies	R. Rajagopalan	Latest	Oxford University Press
4.	Principles of Environmental Science and Engineering	P. Venugoplan Rao	Latest	Prentice Hall of India.
5.	Environmental Science and Engineering	Meenakshi	Latest	Prentice Hall India.
<b>Important Web Links</b>				
1.	<a href="http://www.ct.gov/">http://www.ct.gov/</a>			
2.	<a href="http://www.energy.gov">http://www.energy.gov</a>			



## Skill Enhancement Courses (SEC)

**Code: BCT01210**

**OFFICE AUTOMATION LAB**

**1 Credit [LTP: 0-0-2]**

### A. List of Programs

1	Installing Operating Systems and Basic Software
	<b>MS Word</b>
	<ol style="list-style-type: none"> <li>1. Prepare a document about any tourist destination of your choice with appropriate pictures and editing features.</li> <li>2. Prepare a News Paper Layout. Insert appropriate pictures wherever necessary. Use the following Features: <ul style="list-style-type: none"> <li>• Three Column and Four Column setting</li> <li>• Set One or Two Advertisements</li> <li>• Use Bullets and Numbering.</li> </ul> </li> <li>3. Create a Document consisting of Bio-data. It includes <ul style="list-style-type: none"> <li>• A table giving your qualification and/or experience of work. Table should be Bordered and Shaded.</li> <li>• A Multilevel list giving your areas of interest and further areas of interest. The sub areas should be numbered as</li> <li>• 'a', 'b', etc while the areas should be numbered as '1', '2', etc.</li> <li>• The information should be divided in “General” and “Academic” sections.</li> <li>• The header should contain “BIO-DATA” while the footer should have page numbers in the format Page 1 of 10.</li> <li>• Assign a password for the document to protect it from unauthorized access.</li> </ul> </li> <li>4. Assume that you are coordinating a seminar in your organization. Write a letter to 10 different IT companies asking them to participate in the seminar using mail merge facility.</li> <li>5. Prepare a document which contains template of marks card of students. Assume that there are 10 students. The footer for the document should be 'Poornima University Jaipur'.</li> <li>6. Prepare a document about any topic In mathematics which uses mathematical symbols. (At least 5 mathematical symbols should be used). Assign a password for the document to protect it from unauthorized access. Demonstrate the use of Hyperlink Option. Sets margins to your document, a font of size and double spaced document</li> </ol>
	<b>MS – Excel</b>
	<ol style="list-style-type: none"> <li>7. Open a new workbook, save it as JavaCoffeeBar.xls. In sheet1 write following sales data for Java Coffee bar to show their first 6 months sales.</li> </ol>

	<ul style="list-style-type: none"> <li>• Select cell B4:D4 and change the horizontal alignment to center and text to 90 degree.</li> <li>• All titles should be in bold</li> <li>• Format all cells numbers to currency style and adjust width as necessary.</li> <li>• Add border to data.</li> <li>• Select the cell range A1:H1, merge and center these cells. Apply same format to A2:H2.</li> <li>• Give border, shading and pattern to data in sheet</li> <li>• Apply different font settings for all titles in sheet</li> <li>• Apply green color and bold setting to sales above 10000 (use conditional formatting)</li> <li>• Rename current worksheet as FirstHalfSales</li> </ul> <p>8. Prepare a worksheet to maintain student information. The work sheet should Contain Roll Number, Name and marks in 5 subjects. (Max Marks is 100). Validate the marks. Calculate the total marks. Assign the grade according to the following. Assign grade 'A' if the total marks is above 450. From 401 to 449 assign the grade as 'B'. From 351 to 400 assign the Grade as 'C'. From 300 to 350 the grade to be assigned is 'D'. For the total marks less than 300 No grade is assigned. A student is eligible to get a grade only when he gets 40 and above in all the subjects. In such cases the grade is "FAIL". (Assume that there are 10 students)</p> <p>9. Prepare a pay-bill using a worksheet. The work sheet should contain Employee Id, Name, Designation, Experience and Basic Salary and Job ID. If Job Id is 1 then DA is 40% of the basic salary. HRA is Rs. 4500. If Job Id is 2 then DA is 35% of the basic salary. HRA is Rs. 3500. If Job Id is 3 then DA is 30% of the basic salary. HRA is Rs. 2500. If Job Id is 4 then DA is 25% of the basic salary and HRA is RS.2500. For all the other Job ids DA is 20% of the basic salary and HRA is Rs. 1500. For all the above Job ids PF to be deducted is 4%. For the job ids between 1-4 Rs. 100 to be deducted as Professional Tax. Find the net pay.</p> <p>10. For the above employee worksheet perform the following operations</p> <ul style="list-style-type: none"> <li>• Use filter to display the details of employees whose salary is greater than 10,000.</li> <li>• Sort the employees on the basis of their net pay</li> <li>• Use advance filter to display the details of employees whose designation is "Programmer" and Net Pay is greater than 20,000 with experience greater than 2 yrs</li> </ul> <p>11. Using Excel project the Product sales for any five products for five years.</p> <ul style="list-style-type: none"> <li>• Compute the total sales of each product in the five years.</li> <li>• Compute the total sales of all the products in five year.</li> <li>• Compute the total sales of all products for each year.</li> <li>• Represent annual sale of all the products using Pie-Chart.</li> <li>• Represent annual sales of all products using Bar Chart.</li> <li>• Represent sale of a product for five years using Pie-Chart.</li> <li>• Label and format the graphs</li> </ul> <p>12. Create a statement of Telephone Bill Charge for a customer.</p> <ul style="list-style-type: none"> <li>• Telephone Calls</li> <li>• Up to 150 calls- free</li> <li>• 151 to 500 calls- 0.80 per call</li> <li>• 501 to 1000 calls- 1.00 per call</li> <li>• 1001 to 2000 - 1.25 per call</li> <li>• Above 2000- 1.40 per call</li> </ul> <p>13. Perform Following:</p> <ul style="list-style-type: none"> <li>• Using Excel write sales data with columns product, month and sales. Write at least 5 records. Create Pivot Table chart and Report for the data.</li> </ul>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<ul style="list-style-type: none"> <li>• Create a macro to change the name of worksheet as Macro Example, merge first three columns of first row and write heading as DATA in green color with yellow background</li> <li>• Link word document in excel worksheet to show the usage of linking and embedding.</li> </ul>
	<b>MS - PowerPoint</b>
	<p>14. Assume that you are going to give a presentation about Information Technology. (Choose some latest technologies). The presentation should have minimum 10 slides. Insert appropriate images wherever necessary. Use proper formatting, Diagrams and tables. Show the usage of action buttons, hyperlinks, and animations.</p>

**Code: BCT01611 DISCIPLINE AND TALENT ENRICHMENT PROGRAMME (TEP) – I 2 CREDITS****COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-I shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the FIRST Semester are as follows:

Code	Activity	Hours	Credits
BCT01611.1	Online Eligibility Exam (OLE)	1	0.5
BCT01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	
BCT01611.3	Online Certification Courses	-	



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**

**ITIMS & CT**

**Batch 2019-22**

**BCA- ITIMS & CT**



**Teaching Syllabus  
for  
II Sem.**

# CORE THEORY SUBJECTS

Code: BCT02101

COMPUTER NETWORKS

3 Credits [LTP: 3-0-0]

## COURSE OUTCOME:

It is important for networking professionals to have a sound grounding in the basics of networking and with the networking technology being developed thick and fast, the professionals need to be updated of them at all times. The focus of this unit is providing a background to the basics of networking and its underlying principles.

This course will explore the fundamentals of networking, the principle and purpose behind layered models, devices used in networks and their wireless connectivity and the ways to troubleshoot network related issues. The unit underpins the principles of networking and enables the learners to work towards taking up vendor certifications in the networking domain. To enable students to understand computer networking concepts, how they work, how they operate and the protocols, standards and the models associated with networking technology and their troubleshooting mechanisms.

## A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Networking Fundamentals	8
2.	Basics of Network Devices	7
3.	Basics of Network, Transport and Application Layers	7
4.	WAN Technology	7
5.	Network Operating Systems and Troubleshooting Network	7

## B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Networking Fundamentals</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Basics of Network &amp; Networking, Advantages of Networking, Types of Networks</li><li>• Network Terms- Host, Workstations, Server, Client, Node</li><li>• Types of Network Architecture- Peer-to-Peer &amp; Client/Server, Workgroup Vs. Domain</li><li>• Network Topologies, Types of Topologies, Logical and physical topologies, selecting the Right Topology</li><li>• Types of Transmission Media, Communication Modes, Wiring Standards and Cabling- straight through cable, crossover cable, rollover cable, media connectors (Fibre optic, Coaxial, and TP etc.)</li><li>• Introduction of OSI model, Seven layers of OSI model, Functions of the seven layers, Introduction of TCP/IP Model, TCP, UDP, IP, ICMP, ARP/RARP, Comparison between OSI model &amp; TCP/IP model</li><li>• Overview of Ethernet Addresses</li><li>• Conclusion of the Unit</li></ul>
2.	<b>Basics of Network Devices</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Network Devices- NIC- functions of NIC, installing NIC, Hub, Switch, Bridge, Router, Gateways, And Other Networking Devices, Repeater, CSU/DSU, and modem</li><li>• Data Link Layer: Ethernet, Ethernet standards, Ethernet Components, Point-to-Point Protocol (PPP ),PPP standards, Address Resolution Protocol, Message format, transactions</li></ul>

	<ul style="list-style-type: none"> <li>• Wireless Networking: Wireless Technology, Benefits of Wireless Technology</li> <li>• Types of Wireless Networks: Ad-hoc mode, Infrastructure mode</li> <li>• Wireless network Components: Wireless Access Points, Wireless NICs</li> <li>• wireless LAN standards: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, wireless LAN modulation techniques</li> <li>• wireless security Protocols: WEP,WPA, 802.1X, Installing a wireless LAN</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Basics of Network, Transport and Application Layers</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Layer: Internet Protocol (IP ), IP standards, versions, functions, IPv4 addressing, IPv4 address Classes, IPv4 address types, Subnet Mask, Default Gateway, Public &amp; Private IP Address, methods of assigning IP address, IPv6 address, types, assignment, Data encapsulation, The IPv4 Datagram Format, The IPv6 Datagram Format, Internet Control Message Protocol (ICMP ), ICMPv4, ICMPv6, Internet Group Management Protocol (IGMP ),Introduction to Routing and Switching concepts</li> <li>• Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports &amp; Sockets</li> <li>• Application Layer: DHCP, DNS, HTTP/HTTPS, FTP, TFTP, SFTP, Telnet, Email: SMTP, POP3/IMAP, NTP</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>WAN Technology</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• What Is a WAN?, WAN Switching, WAN Switching techniques Circuit Switching, Packet Switching etc., Connecting to the Internet : PSTN, ISDN, DSL, CATV, Satellite-Based Services, Last Mile Fiber, Cellular Technologies</li> <li>• Connecting LANs : Leased Lines, SONET/SDH, Packet Switching, Remote Access: Dial-up Remote Access, Virtual Private Networking, SSL VPN, Remote Terminal Emulation, Network security: Authentication and Authorization, Tunneling and Encryption Protocols, IPSec, SSL and TLS, Firewall, Other Security Appliances, Security Threats</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Network Operating Systems and Troubleshooting Network</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Operating Systems: Microsoft Operating Systems, Novell NetWare, UNIX and Linux Operating Systems, Macintosh Networking</li> <li>• Trouble Shooting Networks: Command-Line interface Tools, Network and Internet Troubleshooting, Basic Network</li> <li>• Troubleshooting : Troubleshooting Model, identify the affected area, probable cause, implement a solution, test the result, recognize the potential effects of the solution, document the solution</li> <li>• Using Network Utilities: ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat, Hardware trouble shooting tools, system monitoring tools</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr. No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1.	CCNA Cisco Certified Network Associate: Study Guide (With CD)	Todd Lamele	7th Edition (Paperback), Wiley India, 2011
2.	CCENT/CCNA ICND1 640-822 Official Cert Guide	Wendell Odom	3 Edition (Paperback), Pearson, 2013
3.	Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD)	Rick Graziani, Allan Johnson	Pearson, 2008
4	CCNA Exploration Course Booklet : Routing Protocols and Concepts	Cisco Networking Academy	Pearson, 2010



**COURSE OUTCOME:**

Object oriented programming is the most proven technique for developing reliable programs. It helps in increased productivity, reusability of code, decreases development time, and reduces cost of production to an extent. The cost of maintaining such systems have also considerably decreased. There are many languages which used the object oriented concepts and techniques. Some of them are C++, Java, Smalltalk, Objective-C, etc.

Java is a purely object oriented language. Systems/applications created using java programming language reduces the need for developing and maintain complex and space consuming applications. Java has a lot of advantages of being simple, robust, platform independent, etc. Nowadays java is also found in the mobile phones. This unit focuses on the concepts of object oriented programming language and the different constructs for creating applications in java.

To provide students with an understanding of the object oriented concepts which helps in the field of programming, management of data, etc. and of Java programming which helps to explore the object oriented nature of the language and the multi-platform versatility offered by it.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Object Oriented Programming	8
2	Basic Java Programming	10
3	Java Packages and Interfaces	10
3	Exceptions and I/O Handling	10
5	User Interface and Advanced Concepts	10

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Object Oriented Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Classes and Objects</li> <li>• Object Oriented Programming Concepts</li> <li>• Access Specifiers and Access Modifiers</li> <li>• Introduction to Java, Java Virtual Machine</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Basic Java Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Variables</li> <li>• Data Types</li> <li>• Control flow statements – if, else, switch, for, while</li> <li>• Arrays</li> </ul>

	<ul style="list-style-type: none"> <li>• Strings</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Java Packages and Interfaces</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Java classes, Java methods, Packages, Interfaces</li> <li>• Java.util, java.io, java.net, java.sql, java.applet, etc</li> <li>• Collection Framework</li> <li>• Generics</li> <li>• Wrapper classes</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Exceptions and I/O Handling</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Errors and Exceptions</li> <li>• Exception handling</li> <li>• Streams, Readers and Writers</li> <li>• Programming with Files</li> <li>• Multithreaded programming</li> <li>• Networking – Socket Programming</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>User Interface and Advanced Concepts</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• User Interface Components</li> <li>• AWT</li> <li>• Swing</li> <li>• Event Handling</li> <li>• Layouts, Forms</li> <li>• Applets</li> <li>• Annotations</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1	Java Complete Reference	Herbert Schildt	TMH
2	SAMS teach yourself Java-2	Rogers Cedenhead and Leura Lemay	3rd Edition, Pub. Pearson Education.

**COURSE OUTCOME:**

A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently. Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks. In this course the student will be learning about different data structures and their applications.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Data structures	7
2	Searching and Sorting	7
3	Stack and Queue	8
4	Linked List	7
5	Tree Graphs and their Applications	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Data structures</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition,</li> <li>• Classification of data structures: primitive and non-primitive</li> <li>• Elementary data organization</li> <li>• Time and space complexity of an algorithm (Examples), String processing.</li> <li>• Definition of dynamic memory allocation</li> <li>• Accessing the address of a variable</li> <li>• Declaring and initializing pointers -</li> <li>• Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: malloc(), calloc(), free() and realloc().</li> <li>• Recursion – Definition, advantages, Writing Recursive programs – Binomial coefficient, Fibonacci, GCD.</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Searching and Sorting</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Basic Search Techniques</b> - Sequential search, Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search.</li> <li>• <b>Sorting:</b> General background and definition - Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort</li> <li>• Conclusion of the Unit</li> </ul>

<b>3.</b>	<b>Stack, and Queue</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Stack – Definition</li> <li>• Array representation of stack</li> <li>• Operations on stack: Infix, prefix and postfix notations</li> <li>• Conversion of an arithmetic expression from Infix to postfix</li> <li>• Applications of stacks.</li> <li>• Definition of queue</li> <li>• Array representation of queue</li> <li>• Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue,</li> <li>• Operations on all types of Queues</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Linked List</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition of linked list</li> <li>• Components of linked list</li> <li>• Representation of linked list</li> <li>• Advantages and Disadvantages of linked list</li> <li>• Types of linked list: Singly linked list, doubly linked list, Circular linked list</li> <li>• Operations on singly linked list: creation, insertion, deletion, search and display</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Tree, Graphs and their Applications</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition : Tree</li> <li>• Binary tree, Complete binary tree, Binary search tree</li> <li>• Heap</li> <li>• Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node</li> <li>• Binary tree: Array representation of tree, Creation of binary tree.</li> <li>• Traversal of Binary Tree: Preorder, Inorder and postorder.</li> <li>• Graphs</li> <li>• Application of Graphs</li> <li>• Depth First search, Breadth First search.</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr.No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1	Data Structures and Algorithm Analysis in C	Weiss	II Edition, Pearson Education, 2001
2	Schaum's outline series Data structures	Lipschutz	Tata McGraw-Hill
3	Data Structures and program designing using 'C'	Robert Kruse	Pearson Education
4	Programming in ANSI C.	E. Balaguruswamy	Tata McGraw-Hill
5	Data Structures Using C	Bandyopadhyay	Pearson Education, 1999
6	Data Structures Using C	Tenenbaum	Pearson Education, 200
7	Introduction to Data Structures in C	Kamthane	Pearson Education 2005
8	Practical approach to Data Structures	Hanumanthappa M	Practical approach to Data Structures
9	Aaron Data Structures using C and C++	Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron	Pearson Education

**COURSE OUTCOME:**

The course provides an overview of the Linux Operating System, geared toward new users as an exploration tour and getting started guide. This unit provides examples to help the learners get a better understanding of the Linux system. The unit also provides the guidelines for the learners to take up vendor certifications.

The unit explores the basics of Linux, the underlying management of the Linux operating system and its network configuration. The complete system services of Linux is explained along with the troubleshooting.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to Operating System	7
2.	Process Management – Processes and Threads	8
3.	Process Management – Synchronization and Deadlocks	8
4.	Storage Management	6
5.	Protection and Security	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Operating System</b>
	<ul style="list-style-type: none"> <li>Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.</li> <li>History of UNIX, Features &amp; Benefits, Versions of UNIX, Features of UNIX File System,, Commonly Used Commands and getting Started (Login/Logout) .</li> <li>Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces</li> </ul>
2.	<b>Process Management – Processes and Threads</b>
	<ul style="list-style-type: none"> <li>Processes: Process concept, Process scheduling, Co-operating processes, Inter process Communication</li> <li>Threads: Introduction to Threads, Single and Multi-threaded processes</li> <li>CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling,</li> <li><b>Unix Process Management</b> The Structure of Processes: Process States and Transitions - Layout of system memory - Context of a process.</li> <li>Process Control: Process Creation – Signals – Process Termination – Invoking other programs – PID &amp; PPID – Shell on a Shell.</li> </ul>
3.	<b>Process Management – Synchronization and Deadlocks</b>
	<ul style="list-style-type: none"> <li>Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions,</li> <li>Monitors, OS Synchronization, Atomic Transactions. Deadlocks: System Model,</li> </ul>

	<ul style="list-style-type: none"> <li>Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.</li> </ul>
<b>4.</b>	<b>Storage Management</b>
	<ul style="list-style-type: none"> <li>Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.</li> <li>Virtual Memory Management: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing,</li> <li>File-System Interface: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.</li> <li>File-System Implementation: File-System structure. Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery.</li> <li>Disk Management: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation</li> <li><b>The Unix File System</b></li> <li>Inodes - Structure of a regular file – Directories - Conversion of a path name to an inode - Super block - Inode assignment to a new file - Allocation of disk blocks.</li> <li>System calls for the file System: Open – Read - Write - Lseek – Close - File creation - Creation of special files - Changing directory and root - changing owner and mode – stat and fstat - pipes - Dup - Mounting and Un mounting file systems - Link and Un link.</li> </ul>
<b>5.</b>	<b>Protection and Security</b>
	<ul style="list-style-type: none"> <li>Protection: Goals of Protection, Domain of Protection, Security: Security Problem,</li> <li>User Authentication, One – Time Password, Program Threats, System Threats,</li> <li>UNIX SYSTEM ADMINISTRATION Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, managing user accounts-adding &amp; deleting users, changing permissions and ownerships,</li> <li>Creating and managing groups, modifying group attributes, temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security &amp; Permissions, becoming super user using su.</li> <li>Getting system information with uname, host name, disk partitions &amp; sizes, users, kernel, installing and removing packages with rpm command</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Book	Author	Publication
1.	Operating System Concepts and design	Milan Milonkovic,	II Edition, McGraw Hill 1992.
2.	Operation System Concepts	Tanenbaum	2 <sup>nd</sup> Edition, Pearson Education.
3.	Operating System	William Stallings	4 <sup>th</sup> Edition, Pearson Education.
4.	Guide to UNIX Using LINUX	Jack Dent Tony Gaddis, Vikas	Thomson Pub. House Pvt. Ltd. 2010

# Practical

**Code: BCT02205**

**COMPUTER NETWORKS LAB**

**2 Credits [LTP: 0-0-4]**

## **A. List of Programs**

<b>Part A</b>	
	1 Implementation of TCP/IP protocol – I
	2 Implementation of TCP/IP protocol - II
	3 Troubleshooting Scenarios Network - I
	4 Troubleshooting Scenarios Network - II
	5 Router – Configuration - I
	6 Router – Configuration - II
<b>Part B</b>	
	7 Router – Configuration - III
	8 Configuration of IP Address for a Router – I
	9 Configuration of IP Address for a Router - II
	10 Setting up of Passwords – I
	11 Setting up of Passwords – II
	12 Setting up of Passwords - III



**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. A. Write a program to print “Hello World” in Java.  . B. Write a program to add two numbers  C. Write a program to demonstrate the different access specifiers</li> <li>2. A. Write a program to demonstrate inheritance, abstraction, encapsulation and Polymorphism.  B. Write a program to find the factorial of n numbers  C. Write a program to calculate Fibonacci series  D. Write a program to add n numbers and series</li> <li>3. A. Write a program to create an array and store elements into the array.  B. Write a program to find the sum of elements in an array  C. Write a program to demonstrate switch case, if, if-else and for loop.</li> <li>4. A. Write a program to demonstrate the working of methods.  B. Write a program which has four methods – add(), subtract(), multiply() and divide() and demonstrate a simple console calculator.  C. Write a program to accept command line arguments and display them to the user  Write a program which uses different packages</li> <li>5. A. Write a program to create a package.  B. Write a program to handle different exceptions</li> <li>6. A. Write a program to demonstrate try-catch, throw and throws.  B. Write a program to accept input from the user using streams</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Write a program to read a file</li> <li>8. Write a program to write into a file</li> <li>9. A. Write a program to demonstrate client server communication (socket programming)  B. Write a program to create threads and manipulate them</li> <li>10. Write a program to create a user interface to check user authentication.</li> <li>11. Write a program to create a registration form and save the details into a file</li> <li>12. Write a program to create a small animation using applets</li> </ol>

**A. List of Programs:**

Part A	
	<ol style="list-style-type: none"><li>1. Use a recursive function to find<ol style="list-style-type: none"><li>(a) GCD of two numbers.</li><li>(b) Use a recursive function to find the Fibonacci series.</li></ol></li><li>2. Use pointers to find the length of a string and to concatenate two strings.</li><li>3. Perform the following:<ol style="list-style-type: none"><li>(a) Use pointers to copy a string and to extract a substring from a given a string.</li><li>(b) Use a recursive function for the towers of Hanoi with three discs.</li></ol></li><li>4. Perform the following:<ol style="list-style-type: none"><li>(a) Insert an integer into a given position in an array.</li><li>(b) Deleting an integer from an array.</li></ol></li><li>5. Write a program to create a linked list and to display it.</li><li>6. Perform the following:<ol style="list-style-type: none"><li>(a) Write a program to sort N numbers using insertion sort.</li><li>(b) Write a program to sort N numbers using selection sort.</li></ol></li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Inserting a node into a singly linked list.</li><li>8. Deleting a node from a singly linked list.</li><li>9. Pointer implementation of stacks.</li><li>10. Pointer implementation of queues.</li><li>11. Creating a binary search tree and traversing it using in order, preorder and post order.</li><li>12. Sort N numbers using merge sort.</li></ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCT02108**

**ENGLISH-II**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

After studying the building blocks of English like Grammar Essentials, Sentence structure and Professional writing skills, students will now learn about few advanced Grammar like Voice, Tenses, Communication concepts and so on. In the second Unit which is Advanced Grammar, they are taught concepts in Synonyms, Idioms and Phrases and Antonyms all of which give a little color to the language. Students will learn about report writing, review writing and more interesting topics in communication, which is the final topic.

## **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Comprehension	8
2.	Short Paragraph Writing	7
3.	Review writing	7
4.	Writing for Social Media	7
5.	Presentations & Miscellaneous	7

## **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Comprehension</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Comprehension passage 1</li><li>• Comprehension passage 2</li><li>• Comprehension passage 3</li><li>• Comprehension passage 4</li><li>• Comprehension passage 5</li></ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"><li>• Conclusion of Unit</li></ul>
2.	<b>Short Paragraph Writing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Topic 1</li><li>• Topic 2</li><li>• Topic 3</li><li>• Topic 4</li><li>• Topic 5</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences</li><li>• Conclusion of Unit</li></ul>
3.	<b>Review writing</b>

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> </ul> <p>Topic 1 – Book [can be a story review for average students]  Topic 2 - Movie review [different kinds of movies can be suggested too for practice]  Topic 3 – Another Movie review  Topic 4 – Hotel / Café / Recreations centre Review  Topic 5 – Electronic Gadget Review (Laptop/smart phone / speakers/ PSP/ etc.)</p> <p>What is a review? How to write a review. Different types of reviews.</p> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Writing for Social Media</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Writing for social media: Facebook, Inked-in</li> <li>• Points to remember while writing on the social media. How to write Profile summary.</li> <li>• What is a blog? How to write a blog?</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Presentations &amp; Miscellaneous</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Formal Informal</li> <li>• Debate</li> <li>• Discussions</li> <li>• Pick &amp; Speak</li> </ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <p>Usage of Phrases &amp; Idioms</p> <p>Revision of English I &amp; II</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Practical English Usage	Michel Swan	Oxford University Press
2.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English		South Asian edition), Cambridge University Press
3.	Learn Correct English: Grammar, Usage and Composition	Shiv K. Kumar & Hemalatha Nagarajan	Pearson, New Delhi, India
4.	Grammar of the Modern English Language	Sukhdev Singh & Balbir Singh	Foundation Books, New Delhi
5.	Communicative English for Engineers and Professionals	Nitin Bhatnagar and Mamta Bhatnagar	Pearson( New Delhi)
6.	Communicative grammar and composition	Rajesh.K.Lidiya	Oxford Univ Press, New Delhi.

<b>Code: BCT02209</b>	<b>LIFE &amp; CAREER SKILLS-I</b>	<b>1 Credit [LTP: 0-0-2]</b>
-----------------------	-----------------------------------	------------------------------

• **LIST OF ACTIVITIES**

<b>Part - A</b>	
1.	Self-Introduction & knowing your environment
2.	GOAL Setting &Planning
3.	Time Management & Team Work
4.	Personal Grooming and Body language
5.	Etiquettes (Personal, Social, Professional & Corporate) etiquettes
6.	Reading skills: General & Technical Articles
<b>Part - B</b>	
7.	Listening Skills: Analysis of videos by famous Personalities
8.	Writing Skills: Picture perception & Story Making by jumbled words
9.	Speaking Skills: Extempore, JAM & Me against myself
10.	Role Plays
11.	Resume Writing
12.	Group Discussion

**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-II shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the SECOND Semester are as follows:

Code	Activity	Hours	Credits
BCT02610.1	Online Eligibility Exam (OLE)	1	0.5
BCT02610.2	Campus Recruitment Training (CRT) -Introduction to Public Speaking	3	
BCT02610.3	Online Certification Courses	-	

# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & CT) First Year

### Teaching Scheme for First Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BMC01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BMC01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BMC01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BMC01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BMC01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BMC01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BMC01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BMC01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BMC01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BMC01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & CT) First Year

### Teaching Scheme for Second Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BMC02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BMC02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BMC02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BMC02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BMC02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BMC02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BMC02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BMC02610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								



# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & CT) Second Year

### Teaching Scheme for Third Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC03101	Advanced Java Programming	4	-	-	40	60	100	4	Theory	Core Course
BMC03102	Database Management System	3	-	-	40	60	100	3	Theory	Core Course
BMC03103	Object Oriented Analysis & Design	3	-	-	40	60	100	3	Theory	Core Course
BMC03204	Advanced Java Programming Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC03205	Database Management System Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC03106.1	Introduction to Cloud Technology	3	-	-	40	60	100	3	Theory	Departmental Elective
BMC03106.2	Prinicples of Virtualization				40	60	100		Theory	Departmental Elective
BSE03151	Fundamentals of IoT and its Applications	3	-	-	40	60	100	3	Theory	Open Elective
BSE03152	Introduction to Animation and Photography				40	60	100		Theory	Open Elective
BSE03153	Python Programming				40	60	100		Theory	Open Elective
BSE03154	Blockchain Fundamentals				40	60	100		Theory	Open Elective
BSE03155	Big Data Analytics				40	60	100		Theory	Open Elective
BSE03156	Introduction to Digital Marketing				40	60	100		Theory	Open Elective
BMC03313	Summer Project	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BMC03414	Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BMC03215	Personality Development	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC03216	Life & Career Skills-II	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC03617	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC03617.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BMC03617.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BMC03617.3	Online Certification Courses	-	-	-	-	-	-			
	Total	18	0	17				24.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & CT) Second Year

### Teaching Scheme for Fourth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC04101	Installation and Configuration of Server	3	-	-	40	60	100	3	Theory	Core Course
BMC04102	Introduction to Android Application Development	4	-	-	40	60	100	4	Theory	Core Course
BMC04103	Software Engineering	3	-	-	40	60	100	3	Theory	Core Course
BMC04204	Installation and Configuration of Server Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC04205	Introduction to Android Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC04106.1	Enterprise Application Development	3	-	-	40	60	100	3	Theory	Departmental Elective
BMC04106.2	JS Frameworks for Mobile				40	60	100		Theory	Departmental Elective
	Annexure 1	3	-	-	40	60	100	3	Theory	Open Elective (University Level) ANYONE
BMC04407	Industrial Training Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BMC04208	Logical Reasoning and Thinking	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC04209	Life & Career Skills-III	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC04610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC04610.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BMC04610.2	Non Syllabus Project (NSP)	1	-	-	-	-	-			
BMC04610.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	14				23.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA(MA & CT) Third Year

### Teaching Scheme for Fifth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC05101	Professional Android Application Development	3	-	-	40	60	100	3	Theory	Core Course
BMC05102	Cross Platform Application Development	3	-	-	40	60	100	3	Theory	Core Course
BMC05103	Linux Administration	4	-	-	40	60	100	4	Theory	Core Course
BMC05104	Cloud Web Services	3	-	-	40	60	100	3	Theory	Core Course
BMC05205	Professional Android Application Development Lab	-	-	5	60	40	100	2	Practical	Core Course
BMC05206	Cross Platform Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC05207	Linux Administration Lab	-	-	2	60	40	100	1	Practical	Core Course
BMC05108.1	Cloud Migration	3	-	-	40	60	100	3	Theory	Departmental Elective
BMC05108.2	Storage & Datacenter				40	60	100		Theory	Departmental Elective
BMC05209	Life & Career Skills-IV	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC05210	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC05210.1	Campus Recruitment Training/OLE	3	-	-	-	-	-			
BMC05210.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BMC05210.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	14				22.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA(MA & CT) Third Year

### Teaching Scheme for Sixth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC06301	Major Project / Internship	-	-	12	60	40	100	12	Practical	Skill Enhancement Course
BMC06602	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	-	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC06602.1	Campus Recruitment Training/OLE	-	-	-	-	-	-	-		
BMC06602.2	Non Syllabus Project (NSP)	-	-	-	-	-	-	-		
BMC06602.3	Online Certification Courses	-	-	-	-	-	-	-		
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>12</b>				<b>12</b>		
	<b>Total Teaching Hours</b>	<b>12</b>								

Summary Sheet for Teaching Scheme (Credits)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Total Credits
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	13	4	-	-	6	1	-	1	0.5	25.5
II	13	6	-	-	3	-	-	1	0.5	23.5
III	10	4	3	3	-	2	-	2	0.5	24.5
IV	10	4	3	3	-	1	-	2	0.5	23.5
V	13	5	3	-	-	-	-	1	0.5	22.5
VI	-	-	-	-	-	12	-	-	-	12
Total	59	23	9	6	9	16	0	7	2.5	131.5

Summary Sheet for Teaching Scheme (Subjects)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Remarks
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	4	2	-	-	2	1	-	1	3	-
II	4	3	-	-	1	-	-	1	3	-
III	3	2	2	6	-	2	-	2	3	School Level Open Elective
IV	3	2	2	25	-	1	-	2	3	University Level Open Elective
V	4	3	2	-	-	-	-	1	3	-
VI	-	-	-	-	-	1	-	-	3	Internship for 6 months
Total	18	12	6	31	3	5	0	7	18	100

## Annexure - I

### Open Elective Courses at University Level in IV Semester (For All Schools)

Sr. No.	Course Code	Course Name	Teaching Department
1	BOE04111	Industrial Psychology and Sociology	Mechanical Engineering
2	BOE04112	Total Quality Management	Mechanical Engineering
3	BOE04113	Project Management	Mechanical Engineering
4	BOE04114	Logistics and Supply Chain Management	Mechanical Engineering
5	BOE04115	Basics of Petro Industry	Mechanical Engineering
6	BOE04116	Nano Science and Technology	Electrical & Electronics Engineering
7	BOE04117	Non Conventional Energy Sources	Electrical & Electronics Engineering
8	BOE04118	Introduction to Soft Computing	Electrical & Electronics Engineering
9	BOE04119	IPR and Patents	Electrical & Electronics Engineering
10	BOE04120	Artificial intelligence	Electrical & Electronics Engineering
11	BOE04121	E-commerce	Computer Engineering
12	BOE04122	Management Information System (MIS)	Computer Engineering
13	BOE04123	IT Act and Cyber Law	Computer Engineering
14	BOE04124	Python	Computer Engineering
15	BOE04125	Basics of UX/UI Design	Computer Engineering
16	BOE04126	Values and Professional Ethics	SMC
17	BOE04127	Digital Marketing	SMC
18	BOE04128	Business Research	SMC

19	<b>BOE04129</b>	Basics of Economics	SMC
20	<b>BOE04130</b>	Entrepreneurship	SMC
21	<b>BOE04131</b>	Essentials of Management	SMC
22	<b>BOE04132</b>	Organizational Behaviour& Cyber Law	SMC
23	<b>BOE04133</b>	Disaster Management	SPA
24	<b>BOE04134</b>	Foreign Language French & Japanese	SPA
25	<b>BOE04135</b>	Creative Thinking	SDA



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE & ENGINEERING

# BCA

## MA & CT

### Batch 2019-22

# BCA- MA & CT



July 2019

Teaching Scheme for  
BCA –MA & CT  
Detailed Syllabus for  
I & II SEM



POORNIMA UNIVERSITY, JAIPUR										
BCA (MA & CT) First Year (2019-2022)										
Teaching Scheme for First Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BMC01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BMC01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BMC01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BMC01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BMC01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BMC01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BMC01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BMC01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BMC01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BMC01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

POORNIMA UNIVERSITY, JAIPUR										
BCA (MA & CT) First Year (2019-2022)										
Teaching Scheme for Second Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BMC02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BMC02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BMC02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BMC02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BMC02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BMC02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BMC02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BMC02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BMC02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BMC02610 .1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BMC02610 .2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BMC02610 .3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**  
**MA & CT**  
Batch 2019-22

**BCA- MA & CT**



**Teaching Syllabus**  
**for**  
**I Sem.**

## CORE THEORY SUBJECTS

Code: BMC01101

PROGRAMMING FUNDAMENTALS USING C

3 Credits [LTP: 3-0-0]

### COURSE OUTCOME:

Even with the introduction of several high level languages and frameworks, the development of procedural codes is important in several commercial app developments. The object oriented platforms and event driven systems use procedural languages for coding integral command content.

C is an important procedural language and was developed initially to write the UNIX operating system. UNIX operating system, C compiler and all UNIX application programs are written in C. C is popular because, it is easy to learn, produces efficient programs, can handle low-level activities, and can be compiled on a variety of platforms.

This unit focuses on all the basic concepts, syntax and constructs of the C language. For students, who are new to programming, this unit can be considered as the starting point before taking up any other programming oriented units. The students will be implementing the concepts explained here to create simple to complex programs.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Overview of Programming	6
2.	Fundamentals of C programming	6
3.	Advanced programming techniques	8
4.	Dynamic data structures in C	8
5.	Additional features	8

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Overview of Programming</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• <b>Introduction to computer based problem solving</b>, Program design and implementation issues- Flowcharts &amp; Algorithms, Top down design &amp; stepwise refinement</li><li>• <b>Programming environment</b> – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters.</li><li>• Conclusion of the Unit</li></ul>
2.	<b>Fundamentals of C programming</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• <b>Overview of C</b>, Data Types, Constants &amp; Variables, Operators &amp; Expressions</li><li>• <b>Control constructs</b>-if then, for, while, <b>Arrays</b>- single &amp; multidimensional arrays</li><li>• <b>Functions</b>-fundamentals – general form, function arguments, return value</li><li>• <b>Basic I/O</b>-formatted and Unformatted I/O, <b>Advanced features</b>- Type modifiers and storage class specifies for data types, Bit operators, Operator, &amp;operator, * operator, Type casting, type conversion.</li><li>• Conclusion of the Unit</li></ul>
3.	<b>Advanced programming techniques</b>

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Control constructs</b>- Do while, Switch statement, break and continue, exit() function, go to and label</li> <li>• <b>Scope rules</b>- Local &amp; global variables, scope rules of functions</li> <li>• <b>Functions</b>-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi.</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Dynamic data structures in C</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Pointers</b>- The &amp; and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function returning pointers</li> <li>• <b>Structures</b>- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures</li> <li>• <b>Unions</b> – Declaration, uses, enumerated data-types, typedef.</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Additional features</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>File Handling</b> – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf</li> <li>• <b>C Preprocessor</b>- #define, #include, #undef, Conditional compilation directives.</li> <li>• <b>C standard library and header files</b>: Header files, string functions, mathematical functions, Date and Time functions.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Let us C, 6 <sup>th</sup> Edition	Yashwant Kanetka	PBP Publication
2.	The C programming Language	Richie and Kenninghan	BPB Publication,2004
3.	Programming in ANSI C 3 <sup>rd</sup> Edition, 2005	Balaguruswamy	Tata McGraw Hill

### COURSE OUTCOME:

- To understand and the use of basic concepts of Computer components.
- To understand the concept of memory hierarchy and the use of various input-output devices.
- To understand the various computer languages, operating system functions and the application of number systems.
- To understand the basic Computer Networking principles and the applications of WWW, multimedia and the usage of electronic mail.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	<b>Register Transfer and Micro-operation</b>	8
2.	<b>Basic Computer Organization</b>	8
3.	<b>Micro Programmed Control Unit</b>	8
4.	<b>Computer Arithmetic</b>	6
5.	<b>Modes of Data Transfer and Memory Organization</b>	6

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Register Transfer and Micro-operation</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer.</li> <li>• Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor,</li> <li>• Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Basic Computer Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Instruction Codes, Computer Registers: Common bus system, Computer Instructions:</li> <li>• Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions.</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Micro Programmed Control Unit</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines.</li> <li>• Design of Control Unit, Central Processing Unit: Introduction, General Register Organization,</li> <li>• Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes.</li> <li>• Conclusion of Unit</li> </ul>
4.	<b>Computer Arithmetic</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Addition and Subtraction,</li> </ul>

	<ul style="list-style-type: none"> <li>• Multiplication Algorithms (Booth algorithm), Division Algorithms,</li> <li>• Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors.</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Modes of Data Transfer and Memory Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Modes of Data Transfer: Priority Interrupt, Direct Memory Access,</li> <li>• Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory,</li> <li>• Associative Memory, Cache Memory, Virtual Memory</li> <li>• Conclusion of unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Computer System Architecture	Morris Mano	PHI
2.	Computer Organization and Architecture	William Stallings	PHI
3.	Digital Computer Electronics:	An Introduction to Microcomputers by Malvino	TMH

**COURSE OUTCOME:**

Web Technology has revolutionized mankind and entirely changed the way we look at things. Banking, Education, Retailing, Manufacturing and Research are some of the things that have undergone major transformations due to influence from web development. By adding more features, increasing the scope and reach of industries, making it available to users irrespective of their geography, web has captivated the human minds. Learning web technology is one of the top priorities for every computer enthusiast in order to better understand its working and scope. Students will understand the fundamental working technology behind web development and HTML. They will be taught concepts like JS, HTML5 thus making them capable of web development.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to the Internet and the World Wide Web	8
2.	HTML & CSS	8
3.	XML and HTML5, CSS3	8
4.	PHP Server side scripting	6
5.	Practical website development	6

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to the Internet and the World Wide Web</b>
	<ul style="list-style-type: none"> <li>Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture</li> <li>Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development.</li> <li>HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST</li> </ul>
2.	<b>HTML &amp; CSS</b>
	<ul style="list-style-type: none"> <li>Introduction to Html, Html Document structure, Html Editors, Html element/tag &amp; attributes, Designing simple page - Html tag, Head tag, Body tag;</li> <li>More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.</li> <li>Introduction to CSS, Syntax, Selectors ,Embedding CSS to Html, Formatting fonts, Text &amp; background colour, Inline styles, External and Internal Style Sheets, Borders &amp; boxing</li> </ul>
3.	<b>XML and HTML5, CSS3</b>
	<ul style="list-style-type: none"> <li>Introduction to XML, Difference b/w Html &amp; XML, XML editors, XML Elements &amp; Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.</li> <li>Introduction to HTML5, CSS3, New features, Local storage, Web Sockets, Server events, Canvas, Audio &amp; Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers</li> </ul>
4.	<b>PHP Server side scripting</b>
	<ul style="list-style-type: none"> <li>Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays Strings,</li> <li>Environment &amp; environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.</li> </ul>
5	<b>Practical website development</b>



	<ul style="list-style-type: none"> <li>• Commonly used Web Servers and browsers, Setting up a server and domain name, website types and structures,</li> <li>• Web authoring tools, Web hosting, website maintenance, generating traffic to your website.</li> </ul>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Book	Author	Publication
<b>a. Reference Books</b>			
1.	Practical Web Design for Absolute Beginners	Adrian W. West	Apress 2016
2.	Introducing Web Development	Jorg Krause	Apress 2017
3.	HTML & CSS: The Complete Reference	Thomas Powell	McGraw Hill, Fifth Edition, 2010
4.	Creating a Website: The Missing Manual	Mathew Macdonald. O'Reilly	3rd Edition

**COURSE OUTCOME:**

- To learn fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skewness and kurtosis.
- To solve problems on theory of probability, linear programming problems, transportation, assignment and game problems.
- To learn important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications..

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Basic Statistics	8
2.	Probability Distribution	10
3.	Regression	10
4.	Sample introduction, Sampling	10
5.	T-Test	10

**B. DETAILED SYLLABUS**

Unit	Unit Details Regression
1.	<b>Basic Statistics</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Preparing Frequency Distribution Table and Cumulative frequency, Measure of Central Tendency, Types: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.</li> <li>• Measure of Dispersion: Range, Quartile Deviation, mean deviation, Coefficient of mean Deviation, Standard Deviation</li> <li>• Moments: Moments About mean, Moments about any point, Moment about origin, Moment about mean in terms of moment about any point, Moment about any point in terms of Moment about mean.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Probability Distribution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Random Variable- Discrete Random and Continuous Random variable, Probability Distribution of a Random Variable, Mathematical Expectation</li> <li>• Types: Binomial, Poisson, Normal Distribution, Mean and Variance of Binomial, Poisson, and Normal Distribution.</li> <li>• Correlation: Introduction, Types, Properties, Methods of Correlation: Karl Pearson's Coefficient of Correlation, Rank Correlation and Concurrent Deviation method, Probable error</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Regression</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Aim of Regression Analysis, Types of Regression Analysis, Lines of Regression, Properties of Regression Coefficient and Regression Lines, Comparison with Correlation.</li> </ul>

	<ul style="list-style-type: none"> <li>• Curve Fitting: Straight Line, Parabolic curve, Geometric Curve and Exponential Curve Baye's Theorem in Decision Making, Forecasting Techniques</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Sample introduction, Sampling</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Meaning, methods of Sampling, Statistical Inference: Test of Hypothesis, Types of hypothesis, Procedure of hypothesis Testing, Type I and Type II error,</li> <li>• One Tailed and two tailed Test, Types of test of Significance: Test of significance for Attribute-Test of No. of success and test of proportion of success</li> <li>• Test of significance for large samples - Test of significance for single mean and Difference of mean, Test of significance for small samples</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>T-Test</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Test the significance between the mean of a random sample, between the mean of two independent samples.</li> <li>• Chi square Test, ANOVA: Meaning, Assumptions, One way classification, ANOVA Table for One-Way Classified Data</li> <li>• Conclusion of unit</li> </ul>

#### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Fundamentals of Applied statistics	Gupta S.P. and Kapoor	Sultan Chand & Sons, 1996.
2.	Introduction to Statistics	Graybill,	McGraw

# Practicals

Code: BMC01205

PROGRAMMING FUNDAMENTALS USING C LAB

2 Credits [LTP: 0-0-5]

## A. List of Programs

Part A	
	<ol style="list-style-type: none"><li>1. Find biggest number among 4 given numbers</li><li>2. Printing the reverse of an integer.</li><li>3. Printing the odd and even series of N numbers.</li><li>4. Input a string and find the number of each of the vowels appear in the string.</li><li>5. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li><li>6. Printing the reverse of a string.</li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Searching an element in an array using pointers.</li><li>8. Checking whether the given matrix is an identity matrix or not</li><li>9. Addition and subtraction of two matrices.</li><li>10. Multiplication of two matrices.</li><li>11. Print the following:</li><li>12. Reverse of an integer.</li><li>13. Odd and even series of N numbers.</li><li>14. Get a string and convert the lowercase to uppercase and vice--versa using getchar() and putchar().</li><li>15. Perform the following:</li><li>16. Input a string and find the number of each of the vowels appear in the string</li><li>17. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li></ol>

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. 1. Hello World Web Page               <ol style="list-style-type: none"> <li>a) Create a web page using basic HTML features like tags, attributes, elements and page title.</li> <li>b) How to install, and configure a web server</li> </ol> </li> <li>2. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) A more functional web page by making use of headings, paragraphs, lists, images and links.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Use different font styles.</li> <li>ii. Set background image for both the page and single elements on the page.</li> </ol> </li> </ol> </li> <li>3. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) Using textboxes, check boxes, radio buttons and submit buttons.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Control the repetition of image with background-repeat property.</li> <li>ii. Define style for links as a: link, b: active, c: hover, d: visited.</li> <li>iii. Add customized cursors for links.</li> </ol> </li> </ol> </li> <li>4. Create XMLHttpRequest and retrieve data from a text file and an XML file.</li> <li>5. Create the following webpage:               <ol style="list-style-type: none"> <li>a) Show the class timetable in a tabular format.</li> <li>b) Create a webpage using HTML to show your geolocation.</li> </ol> </li> <li>6. Create a webpage using HTML for audio and video player.</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Create a login registration form using PHP.</li> <li>8. Develop a PHP webpage to manipulating files such as creating, writing, reading and uploading.</li> <li>9. Create a dynamic webpage by using PHP conditional operators, loops and strings to create an dynamic timetable page.</li> <li>10. Develop a PHP web application track the user as how many times visited and last visited time</li> <li>11. Develop a static website – I.</li> <li>12. Develop a dynamic website –II</li> </ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BMC01107**

**ENGLISH-I**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

### **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Everyday Conversations	8
2.	Asking for..	7
3.	Reporting/ Describing	7
4.	Meeting People	7
5.	Expressing & Talking about....	7

### **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Everyday Conversations</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Introducing self / others</li><li>• Weather</li><li>• Classroom</li><li>• Asking about facilities around</li><li>• Describing a person / thing</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
2.	<b>Asking for..</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Help/ Suggestion/ ideas</li><li>• Clarification/ Directions</li><li>• Time/ food</li><li>• Advice</li><li>• Uses</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
3.	<b>Reporting/ Describing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Incidences</li><li>• Personalities</li><li>• Experiences</li><li>• Wants/Needs</li><li>• Intentions</li></ul>

	<ul style="list-style-type: none"> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Meeting People</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Greetings</li> <li>• Starting the Conversation</li> <li>• Small talks</li> <li>• Closing the conversation</li> <li>• Points to cover: Vocabulary, Grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheet</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Expressing &amp; Talking about....</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Happiness/Displeasure</li> <li>• Preferences</li> <li>• Doubts</li> <li>• Views</li> <li>• Unawareness</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Interests</li> <li>• Different Cultures, Clothes, cars, institutes, situations</li> <li>• Schedules, prices</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Speak Now Level I & II	Jack C Richards & David Bohlke	Oxford Press
2.	Business Benchmark, Level –	Guy Brook-Hart	Upper Intermediate by Cambridge University Press
3.	Practical English Usage	Michel Swan	Oxford University Press
4.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English	Ronald Carter, Michael McCarthy	(South Asian edition), Cambridge University Press

**COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Communication Process	6
2.	Types of Communication & Barriers to communication	5
3.	Listening Skills & Reading Skills	5
4.	Conversation Skills	4
5.	Telephone Etiquette	4

**B. DETAILED SYLLABUS**

Unit	Unit Details
<b>1.</b>	<b>Communication Process</b>
	<ul style="list-style-type: none"> <li>What is communication?</li> <li>The communication model</li> <li>Elements of communication</li> <li>Importance of effective communication skills in the business world</li> <li>Components of Communication</li> <li>Process, practicing effective communication, good communication Vs effective communication, styles of communication, intercultural communication skills- need for attitude change and benefits</li> </ul>
<b>2.</b>	<b>Types of Communication &amp; Barriers to communication</b>
	<ul style="list-style-type: none"> <li>Verbal Communication</li> <li>Non Verbal Communication</li> <li>Written Communication</li> <li>Do's and don'ts of each type</li> <li>Barriers to effective communication and how to overcome them</li> <li>Interaction of verbal and non-verbal communication, talents of a corporate communicator, silence- merits and limitations of each type</li> </ul>
<b>3.</b>	<b>Listening Skills &amp; Reading Skills</b>
	<ul style="list-style-type: none"> <li>What is listening</li> <li>Various types of listening – Active, passive, selective, listening and note taking, listening and comprehending, listening to speak,</li> <li>Principles of good listening</li> <li>Techniques to develop effective listening skills</li> <li>Reading Skills- skimming, scanning and inferring- common reading techniques,</li> <li>Practicing smart reading.</li> </ul>
<b>4.</b>	<b>Conversation Skills</b>
	<ul style="list-style-type: none"> <li>Importance of conversation skills</li> <li>Features of a good conversation</li> <li>Tips to improve Conversation skills</li> </ul>



	<ul style="list-style-type: none"> <li>• Importance of questioning skills, techniques to ask right questions- role play situations to practice the same, discussing issues (social, political and cultural), formal and informal conversation</li> </ul>
<b>5.</b>	<b>Telephone Etiquette</b>
	<ul style="list-style-type: none"> <li>• Basic rules of telephone etiquette- formal vs. informal; tone, pitch and vocabulary related to formal ways of speaking over the phone, leaving voice messages; practice sessions (role plays)</li> <li>• <b>Persuasive communication</b> :What is persuasive communication, different techniques of persuasive communication, How to negotiate using persuasive communication, the act of negotiation, negotiation style and their contexts, fundamentals of negotiation, common hurdles in negotiation and how to overcome them</li> </ul>

**COURSE OUTCOME:**

The student would be able:

- To acquire the knowledge of environmental studies and understand the principles of ecology and environmental issues.
- To distinguish & analyze different water treatment methods and conservation of water.
- To design innovative ideas for controlling air, noise & soil pollution.
- To develop deeper knowledge in the problems and possibilities of waste management from a national and global perspective and demonstrate socio-economic skills for sustainable development.
- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Environmental studies	6
2.	Ecology	8
3.	Natural & Biological Resources	8
4.	Social Issues	7
5.	Environmental Pollution	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1	<b>Environmental studies</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Scope</li> <li>• Importance &amp; components</li> <li>• Natural and Manmade.</li> <li>• Conclusion of the Unit</li> </ul>
2	<b>Ecology</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Concept</li> <li>• Structure and Functions of Ecosystem</li> <li>• Biotic and A biotic Factors</li> <li>• Environmental Interactions.</li> <li>• Defining Communication Theories.</li> <li>• Conclusion of the Unit</li> </ul>
3	<b>Natural &amp; Biological Resources</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Plants</li> <li>• Animal and Microorganisms.</li> <li>• Conclusion of the Unit</li> </ul>
4	<b>Social Issues</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Human Population</li> <li>• Environment</li> </ul>

	<ul style="list-style-type: none"> <li>• Conclusion of the Unit</li> </ul>
<b>5</b>	<b>Environmental Pollution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Cause</li> <li>• Effects</li> <li>• Types and Control Measures</li> <li>• Conservation and preservation of Environment.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Reference Book	Author	Edition	Publication
1.	Environmental Studies	Erach Barucha	Latest	UGC
2.	Environmental Studies	Benny Joseph	Latest	Tata McgrawHill
3.	Environmental Studies	R. Rajagopalan	Latest	Oxford University Press
4.	Principles of Environmental Science and Engineering	P. Venugoplan Rao	Latest	Prentice Hall of India.
5.	Environmental Science and Engineering	Meenakshi	Latest	Prentice Hall India.
<b>Important Web Links</b>				
1.	<a href="http://www.ct.gov/">http://www.ct.gov/</a>			
2.	<a href="http://www.energy.gov">http://www.energy.gov</a>			

## Skill Enhancement Courses (SEC)

**Code: BMC01210**

**OFFICE AUTOMATION LAB**

**1 Credit [LTP: 0-0-2]**

### A. List of Programs

1	Installing Operating Systems and Basic Software
	<b>MS Word</b>
	<ol style="list-style-type: none"> <li>1. Prepare a document about any tourist destination of your choice with appropriate pictures and editing features.</li> <li>2. Prepare a News Paper Layout. Insert appropriate pictures wherever necessary. Use the following Features: <ul style="list-style-type: none"> <li>• Three Column and Four Column setting</li> <li>• Set One or Two Advertisements</li> <li>• Use Bullets and Numbering.</li> </ul> </li> <li>3. Create a Document consisting of Bio-data. It includes <ul style="list-style-type: none"> <li>• A table giving your qualification and/or experience of work. Table should be Bordered and Shaded.</li> <li>• A Multilevel list giving your areas of interest and further areas of interest. The sub areas should be numbered as</li> <li>• 'a', 'b', etc while the areas should be numbered as '1', '2', etc.</li> <li>• The information should be divided in “General” and “Academic” sections.</li> <li>• The header should contain “BIO-DATA” while the footer should have page numbers in the format Page 1 of 10.</li> <li>• Assign a password for the document to protect it from unauthorized access.</li> </ul> </li> <li>4. Assume that you are coordinating a seminar in your organization. Write a letter to 10 different IT companies asking them to participate in the seminar using mail merge facility.</li> <li>5. Prepare a document which contains template of marks card of students. Assume that there are 10 students. The footer for the document should be 'Poornima University Jaipur'.</li> <li>6. Prepare a document about any topic In mathematics which uses mathematical symbols. (At least 5 mathematical symbols should be used). Assign a password for the document to protect it from unauthorized access. Demonstrate the use of Hyperlink Option. Sets margins to your document, a font of size and double spaced document</li> </ol>
	<b>MS – Excel</b>
	<ol style="list-style-type: none"> <li>7. Open a new workbook, save it as JavaCoffeeBar.xls. In sheet1 write following sales data for Java Coffee bar to show their first 6 months sales. <ul style="list-style-type: none"> <li>• Select cell B4:D4 and change the horizontal alignment to center and text to 90 degree.</li> </ul> </li> </ol>

- All titles should be in bold
  - Format all cells numbers to currency style and adjust width as necessary.
  - Add border to data.
  - Select the cell range A1:H1, merge and center these cells. Apply same format to A2:H2.
  - Give border, shading and pattern to data in sheet
  - Apply different font settings for all titles in sheet
  - Apply green color and bold setting to sales above 10000 (use conditional formatting)
  - Rename current worksheet as FirstHalfSales
8. Prepare a worksheet to maintain student information. The work sheet should Contain Roll Number, Name and marks in 5 subjects. (Max Marks is 100). Validate the marks. Calculate the total marks. Assign the grade according to the following. Assign grade 'A' if the total marks is above 450. From 401 to 449 assign the grade as 'B'. From 351 to 400 assign the Grade as 'C'. From 300 to 350 the grade to be assigned is 'D'. For the total marks less than 300 No grade is assigned. A student is eligible to get a grade only when he gets 40 and above in all the subjects. In such cases the grade is “FAIL”. (Assume that there are 10 students)
  9. Prepare a pay-bill using a worksheet. The work sheet should contain Employee Id, Name, Designation, Experience and Basic Salary and Job ID. If Job Id is 1 then DA is 40% of the basic salary. HRA is Rs. 4500. If Job Id is 2 then DA is 35% of the basic salary. HRA is Rs. 3500. If Job Id is 3 then DA is 30% of the basic salary. HRA is Rs. 2500. If Job Id is 4 then DA is 25% of the basic salary and HRA is RS.2500. For all the other Job ids DA is 20% of the basic salary and HRA is Rs. 1500. For all the above Job ids PF to be deducted is 4%. For the job ids between 1-4 Rs. 100 to be deducted as Professional Tax. Find the net pay.
  10. For the above employee worksheet perform the following operations
    - Use filter to display the details of employees whose salary is greater than 10,000.
    - Sort the employees on the basis of their net pay
    - Use advance filter to display the details of employees whose designation is "Programmer" and Net Pay is greater than 20,000 with experience greater than 2 yrs
  11. Using Excel project the Product sales for any five products for five years.
    - Compute the total sales of each product in the five years.
    - Compute the total sales of all the products in five year.
    - Compute the total sales of all products for each year.
    - Represent annual sale of all the products using Pie-Chart.
    - Represent annual sales of all products using Bar Chart.
    - Represent sale of a product for five years using Pie-Chart.
    - Label and format the graphs
  12. Create a statement of Telephone Bill Charge for a customer.
    - Telephone Calls
    - Up to 150 calls- free
    - 151 to 500 calls- 0.80 per call
    - 501 to 1000 calls- 1.00 per call
    - 1001 to 2000 - 1.25 per call
    - Above 2000- 1.40 per call
  13. Perform Following:
    - Using Excel write sales data with columns product, month and sales. Write at least 5 records. Create Pivot Table chart and Report for the data.
    - Create a macro to change the name of worksheet as Macro Example, merge first three columns of first row and write heading as DATA in green color with yellow background

	<ul style="list-style-type: none"> <li>• Link word document in excel worksheet to show the usage of linking and embedding.</li> </ul>
	<b>MS - PowerPoint</b>
	<p>14. Assume that you are going to give a presentation about Information Technology. (Choose some latest technologies). The presentation should have minimum 10 slides. Insert appropriate images wherever necessary. Use proper formatting, Diagrams and tables. Show the usage of action buttons, hyperlinks, and animations.</p>

**Code: BMC01611 DISCIPLINE AND TALENT ENRICHMENT PROGRAMME (TEP) – I 2 CREDITS****COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-I shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the FIRST Semester are as follows:

Code	Activity	Hours	Credits
BMC01611.1	Online Eligibility Exam (OLE)	1	0.5
BMC01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	
BMC01611.3	Online Certification Courses	-	



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**

**MA & CT**

**Batch 2019-22**

**BCA- MA & CT**



**Teaching Syllabus  
for  
II Sem.**



# CORE THEORY SUBJECTS

Code: BMC02101

COMPUTER NETWORKS

3 Credits [LTP: 3-0-0]

## COURSE OUTCOME:

It is important for networking professionals to have a sound grounding in the basics of networking and with the networking technology being developed thick and fast, the professionals need to be updated of them at all times. The focus of this unit is providing a background to the basics of networking and its underlying principles.

This course will explore the fundamentals of networking, the principle and purpose behind layered models, devices used in networks and their wireless connectivity and the ways to troubleshoot network related issues. The unit underpins the principles of networking and enables the learners to work towards taking up vendor certifications in the networking domain. To enable students to understand computer networking concepts, how they work, how they operate and the protocols, standards and the models associated with networking technology and their troubleshooting mechanisms.

## A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Networking Fundamentals	8
2.	Basics of Network Devices	7
3.	Basics of Network, Transport and Application Layers	7
4.	WAN Technology	7
5.	Network Operating Systems and Troubleshooting Network	7

## B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Networking Fundamentals</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Basics of Network &amp; Networking, Advantages of Networking, Types of Networks</li><li>• Network Terms- Host, Workstations, Server, Client, Node</li><li>• Types of Network Architecture- Peer-to-Peer &amp; Client/Server, Workgroup Vs. Domain</li><li>• Network Topologies, Types of Topologies, Logical and physical topologies, selecting the Right Topology</li><li>• Types of Transmission Media, Communication Modes, Wiring Standards and Cabling- straight through cable, crossover cable, rollover cable, media connectors (Fibre optic, Coaxial, and TP etc.)</li><li>• Introduction of OSI model, Seven layers of OSI model, Functions of the seven layers, Introduction of TCP/IP Model, TCP, UDP, IP, ICMP, ARP/RARP, Comparison between OSI model &amp; TCP/IP model</li><li>• Overview of Ethernet Addresses</li><li>• Conclusion of the Unit</li></ul>
2.	<b>Basics of Network Devices</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Network Devices- NIC- functions of NIC, installing NIC, Hub, Switch, Bridge, Router, Gateways, And Other Networking Devices, Repeater, CSU/DSU, and modem</li><li>• Data Link Layer: Ethernet, Ethernet standards, Ethernet Components, Point-to-Point Protocol (PPP ),PPP standards, Address Resolution Protocol, Message format, transactions</li></ul>

	<ul style="list-style-type: none"> <li>• Wireless Networking: Wireless Technology, Benefits of Wireless Technology</li> <li>• Types of Wireless Networks: Ad-hoc mode, Infrastructure mode</li> <li>• Wireless network Components: Wireless Access Points, Wireless NICs</li> <li>• wireless LAN standards: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, wireless LAN modulation techniques</li> <li>• wireless security Protocols: WEP,WPA, 802.1X, Installing a wireless LAN</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Basics of Network, Transport and Application Layers</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Layer: Internet Protocol (IP ), IP standards, versions, functions, IPv4 addressing, IPv4 address Classes, IPv4 address types, Subnet Mask, Default Gateway, Public &amp; Private IP Address, methods of assigning IP address, IPv6 address, types, assignment, Data encapsulation, The IPv4 Datagram Format, The IPv6 Datagram Format, Internet Control Message Protocol (ICMP ), ICMPv4, ICMPv6, Internet Group Management Protocol (IGMP ),Introduction to Routing and Switching concepts</li> <li>• Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports &amp; Sockets</li> <li>• Application Layer: DHCP, DNS, HTTP/HTTPS, FTP, TFTP, SFTP, Telnet, Email: SMTP, POP3/IMAP, NTP</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>WAN Technology</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• What Is a WAN?, WAN Switching, WAN Switching techniques Circuit Switching, Packet Switching etc., Connecting to the Internet : PSTN, ISDN, DSL, CATV, Satellite-Based Services, Last Mile Fiber, Cellular Technologies</li> <li>• Connecting LANs : Leased Lines, SONET/SDH, Packet Switching, Remote Access: Dial-up Remote Access, Virtual Private Networking, SSL VPN, Remote Terminal Emulation, Network security: Authentication and Authorization, Tunneling and Encryption Protocols, IPSec, SSL and TLS, Firewall, Other Security Appliances, Security Threats</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Network Operating Systems and Troubleshooting Network</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Operating Systems: Microsoft Operating Systems, Novell NetWare, UNIX and Linux Operating Systems, Macintosh Networking</li> <li>• Trouble Shooting Networks: Command-Line interface Tools, Network and Internet Troubleshooting, Basic Network</li> <li>• Troubleshooting : Troubleshooting Model, identify the affected area, probable cause, implement a solution, test the result, recognize the potential effects of the solution, document the solution</li> <li>• Using Network Utilities: ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat, Hardware trouble shooting tools, system monitoring tools</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr. No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1.	CCNA Cisco Certified Network Associate: Study Guide (With CD)	Todd Lamele	7th Edition (Paperback), Wiley India, 2011
2.	CCENT/CCNA ICND1 640-822 Official Cert Guide	Wendell Odom	3 Edition (Paperback), Pearson, 2013
3.	Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD)	Rick Graziani, Allan Johnson	Pearson, 2008
4	CCNA Exploration Course Booklet : Routing Protocols and Concepts	Cisco Networking Academy	Pearson, 2010

**COURSE OUTCOME:**

Object oriented programming is the most proven technique for developing reliable programs. It helps in increased productivity, reusability of code, decreases development time, and reduces cost of production to an extent. The cost of maintaining such systems have also considerably decreased. There are many languages which used the object oriented concepts and techniques. Some of them are C++, Java, Smalltalk, Objective-C, etc.

Java is a purely object oriented language. Systems/applications created using java programming language reduces the need for developing and maintain complex and space consuming applications. Java has a lot of advantages of being simple, robust, platform independent, etc. Nowadays java is also found in the mobile phones. This unit focuses on the concepts of object oriented programming language and the different constructs for creating applications in java.

To provide students with an understanding of the object oriented concepts which helps in the field of programming, management of data, etc. and of Java programming which helps to explore the object oriented nature of the language and the multi-platform versatility offered by it.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Object Oriented Programming	8
2	Basic Java Programming	10
3	Java Packages and Interfaces	10
3	Exceptions and I/O Handling	10
5	User Interface and Advanced Concepts	10

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Object Oriented Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Classes and Objects</li> <li>• Object Oriented Programming Concepts</li> <li>• Access Specifiers and Access Modifiers</li> <li>• Introduction to Java, Java Virtual Machine</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Basic Java Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Variables</li> <li>• Data Types</li> <li>• Control flow statements – if, else, switch, for, while</li> <li>• Arrays</li> </ul>

	<ul style="list-style-type: none"> <li>• Strings</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Java Packages and Interfaces</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Java classes, Java methods, Packages, Interfaces</li> <li>• Java.util, java.io, java.net, java.sql, java.applet, etc</li> <li>• Collection Framework</li> <li>• Generics</li> <li>• Wrapper classes</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Exceptions and I/O Handling</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Errors and Exceptions</li> <li>• Exception handling</li> <li>• Streams, Readers and Writers</li> <li>• Programming with Files</li> <li>• Multithreaded programming</li> <li>• Networking – Socket Programming</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>User Interface and Advanced Concepts</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• User Interface Components</li> <li>• AWT</li> <li>• Swing</li> <li>• Event Handling</li> <li>• Layouts, Forms</li> <li>• Applets</li> <li>• Annotations</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1	Java Complete Reference	Herbert Schildt	TMH
2	SAMS teach yourself Java-2	Rogers Cedenhead and Leura Lemay	3rd Edition, Pub. Pearson Education.

**COURSE OUTCOME:**

A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently. Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks. In this course the student will be learning about different data structures and their applications.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Data structures	7
2	Searching and Sorting	7
3	Stack and Queue	8
4	Linked List	7
5	Tree Graphs and their Applications	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Data structures</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition,</li> <li>• Classification of data structures: primitive and non-primitive</li> <li>• Elementary data organization</li> <li>• Time and space complexity of an algorithm (Examples), String processing.</li> <li>• Definition of dynamic memory allocation</li> <li>• Accessing the address of a variable</li> <li>• Declaring and initializing pointers -</li> <li>• Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: malloc(), calloc(), free() and realloc().</li> <li>• Recursion – Definition, advantages, Writing Recursive programs – Binomial coefficient, Fibonacci, GCD.</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Searching and Sorting</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Basic Search Techniques</b> - Sequential search, Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search.</li> <li>• <b>Sorting:</b> General background and definition - Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort</li> <li>• Conclusion of the Unit</li> </ul>

<b>3.</b>	<b>Stack, and Queue</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Stack – Definition</li> <li>• Array representation of stack</li> <li>• Operations on stack: Infix, prefix and postfix notations</li> <li>• Conversion of an arithmetic expression from Infix to postfix</li> <li>• Applications of stacks.</li> <li>• Definition of queue</li> <li>• Array representation of queue</li> <li>• Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue,</li> <li>• Operations on all types of Queues</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Linked List</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition of linked list</li> <li>• Components of linked list</li> <li>• Representation of linked list</li> <li>• Advantages and Disadvantages of linked list</li> <li>• Types of linked list: Singly linked list, doubly linked list, Circular linked list</li> <li>• Operations on singly linked list: creation, insertion, deletion, search and display</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Tree, Graphs and their Applications</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition : Tree</li> <li>• Binary tree, Complete binary tree, Binary search tree</li> <li>• Heap</li> <li>• Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node</li> <li>• Binary tree: Array representation of tree, Creation of binary tree.</li> <li>• Traversal of Binary Tree: Preorder, Inorder and postorder.</li> <li>• Graphs</li> <li>• Application of Graphs</li> <li>• Depth First search, Breadth First search.</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr.No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1	Data Structures and Algorithm Analysis in C	Weiss	II Edition, Pearson Education, 2001
2	Schaum's outline series Data structures	Lipschutz	Tata McGraw-Hill
3	Data Structures and program designing using 'C'	Robert Kruse	Pearson Education
4	Programming in ANSI C.	E. Balaguruswamy	Tata McGraw-Hill
5	Data Structures Using C	Bandyopadhyay	Pearson Education, 1999
6	Data Structures Using C	Tenenbaum	Pearson Education, 200
7	Introduction to Data Structures in C	Kamthane	Pearson Education 2005
8	Practical approach to Data Structures	Hanumanthappa M	Practical approach to Data Structures
9	Aaron Data Structures using C and C++	Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron	Pearson Education



**COURSE OUTCOME:**

The course provides an overview of the Linux Operating System, geared toward new users as an exploration tour and getting started guide. This unit provides examples to help the learners get a better understanding of the Linux system. The unit also provides the guidelines for the learners to take up vendor certifications.

The unit explores the basics of Linux, the underlying management of the Linux operating system and its network configuration. The complete system services of Linux is explained along with the troubleshooting.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to Operating System	7
2.	Process Management – Processes and Threads	8
3.	Process Management – Synchronization and Deadlocks	8
4.	Storage Management	6
5.	Protection and Security	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Operating System</b>
	<ul style="list-style-type: none"> <li>Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.</li> <li>History of UNIX, Features &amp; Benefits, Versions of UNIX, Features of UNIX File System,, Commonly Used Commands and getting Started (Login/Logout) .</li> <li>Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces</li> </ul>
2.	<b>Process Management – Processes and Threads</b>
	<ul style="list-style-type: none"> <li>Processes: Process concept, Process scheduling, Co-operating processes, Inter process Communication</li> <li>Threads: Introduction to Threads, Single and Multi-threaded processes</li> <li>CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling,</li> <li><b>Unix Process Management</b> The Structure of Processes: Process States and Transitions - Layout of system memory - Context of a process.</li> <li>Process Control: Process Creation – Signals – Process Termination – Invoking other programs – PID &amp; PPID – Shell on a Shell.</li> </ul>
3.	<b>Process Management – Synchronization and Deadlocks</b>
	<ul style="list-style-type: none"> <li>Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions,</li> <li>Monitors, OS Synchronization, Atomic Transactions. Deadlocks: System Model,</li> </ul>

	<ul style="list-style-type: none"> <li>Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.</li> </ul>
<b>4.</b>	<b>Storage Management</b>
	<ul style="list-style-type: none"> <li>Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.</li> <li>Virtual Memory Management: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing,</li> <li>File-System Interface: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.</li> <li>File-System Implementation: File-System structure. Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery.</li> <li>Disk Management: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation</li> <li><b>The Unix File System</b></li> <li>Inodes - Structure of a regular file – Directories - Conversion of a path name to an inode - Super block - Inode assignment to a new file - Allocation of disk blocks.</li> <li>System calls for the file System: Open – Read - Write - Lseek – Close - File creation - Creation of special files - Changing directory and root - changing owner and mode – stat and fstat - pipes - Dup - Mounting and Un mounting file systems - Link and Un link.</li> </ul>
<b>5.</b>	<b>Protection and Security</b>
	<ul style="list-style-type: none"> <li>Protection: Goals of Protection, Domain of Protection, Security: Security Problem,</li> <li>User Authentication, One – Time Password, Program Threats, System Threats,</li> <li>UNIX SYSTEM ADMINISTRATION Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, managing user accounts-adding &amp; deleting users, changing permissions and ownerships,</li> <li>Creating and managing groups, modifying group attributes, temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security &amp; Permissions, becoming super user using su.</li> <li>Getting system information with uname, host name, disk partitions &amp; sizes, users, kernel, installing and removing packages with rpm command</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Book	Author	Publication
1.	Operating System Concepts and design	Milan Milonkovic,	II Edition, McGraw Hill 1992.
2.	Operation System Concepts	Tanenbaum	2 <sup>nd</sup> Edition, Pearson Education.
3.	Operating System	William Stallings	4 <sup>th</sup> Edition, Pearson Education.
4.	Guide to UNIX Using LINUX	Jack Dent Tony Gaddis, Vikas	Thomson Pub. House Pvt. Ltd. 2010

# Practical

**Code: BMC02205**

**COMPUTER NETWORKS LAB**

**2 Credits [LTP: 0-0-4]**

## **A. List of Programs**

<b>Part A</b>	
	1 Implementation of TCP/IP protocol – I
	2 Implementation of TCP/IP protocol - II
	3 Troubleshooting Scenarios Network - I
	4 Troubleshooting Scenarios Network - II
	5 Router – Configuration - I
	6 Router – Configuration - II
<b>Part B</b>	
	7 Router – Configuration - III
	8 Configuration of IP Address for a Router – I
	9 Configuration of IP Address for a Router - II
	10 Setting up of Passwords – I
	11 Setting up of Passwords – II
	12 Setting up of Passwords - III

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. A. Write a program to print “Hello World” in Java.  . B. Write a program to add two numbers  C. Write a program to demonstrate the different access specifiers</li> <li>2. A. Write a program to demonstrate inheritance, abstraction, encapsulation and Polymorphism.  B. Write a program to find the factorial of n numbers  C. Write a program to calculate Fibonacci series  D. Write a program to add n numbers and series</li> <li>3. A. Write a program to create an array and store elements into the array.  B. Write a program to find the sum of elements in an array  C. Write a program to demonstrate switch case, if, if-else and for loop.</li> <li>4. A. Write a program to demonstrate the working of methods.  B. Write a program which has four methods – add(), subtract(), multiply() and divide() and demonstrate a simple console calculator.  C. Write a program to accept command line arguments and display them to the user  Write a program which uses different packages</li> <li>5. A. Write a program to create a package.  B. Write a program to handle different exceptions</li> <li>6. A. Write a program to demonstrate try-catch, throw and throws.  B. Write a program to accept input from the user using streams</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Write a program to read a file</li> <li>8. Write a program to write into a file</li> <li>9. A. Write a program to demonstrate client server communication (socket programming)  B. Write a program to create threads and manipulate them</li> <li>10. Write a program to create a user interface to check user authentication.</li> <li>11. Write a program to create a registration form and save the details into a file</li> <li>12. Write a program to create a small animation using applets</li> </ol>

**A. List of Programs:**

Part A	
	<ol style="list-style-type: none"><li>1. Use a recursive function to find<ol style="list-style-type: none"><li>(a) GCD of two numbers.</li><li>(b) Use a recursive function to find the Fibonacci series.</li></ol></li><li>2. Use pointers to find the length of a string and to concatenate two strings.</li><li>3. Perform the following:<ol style="list-style-type: none"><li>(a) Use pointers to copy a string and to extract a substring from a given a string.</li><li>(b) Use a recursive function for the towers of Hanoi with three discs.</li></ol></li><li>4. Perform the following:<ol style="list-style-type: none"><li>(a) Insert an integer into a given position in an array.</li><li>(b) Deleting an integer from an array.</li></ol></li><li>5. Write a program to create a linked list and to display it.</li><li>6. Perform the following:<ol style="list-style-type: none"><li>(a) Write a program to sort N numbers using insertion sort.</li><li>(b) Write a program to sort N numbers using selection sort.</li></ol></li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Inserting a node into a singly linked list.</li><li>8. Deleting a node from a singly linked list.</li><li>9. Pointer implementation of stacks.</li><li>10. Pointer implementation of queues.</li><li>11. Creating a binary search tree and traversing it using in order, preorder and post order.</li><li>12. Sort N numbers using merge sort.</li></ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BMC02108**

**ENGLISH-II**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

After studying the building blocks of English like Grammar Essentials, Sentence structure and Professional writing skills, students will now learn about few advanced Grammar like Voice, Tenses, Communication concepts and so on. In the second Unit which is Advanced Grammar, they are taught concepts in Synonyms, Idioms and Phrases and Antonyms all of which give a little color to the language. Students will learn about report writing, review writing and more interesting topics in communication, which is the final topic.

## **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Comprehension	8
2.	Short Paragraph Writing	7
3.	Review writing	7
4.	Writing for Social Media	7
5.	Presentations & Miscellaneous	7

## **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Comprehension</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Comprehension passage 1</li><li>• Comprehension passage 2</li><li>• Comprehension passage 3</li><li>• Comprehension passage 4</li><li>• Comprehension passage 5</li></ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"><li>• Conclusion of Unit</li></ul>
2.	<b>Short Paragraph Writing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Topic 1</li><li>• Topic 2</li><li>• Topic 3</li><li>• Topic 4</li><li>• Topic 5</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences</li><li>• Conclusion of Unit</li></ul>
3.	<b>Review writing</b>

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> </ul> <p>Topic 1 – Book [can be a story review for average students]  Topic 2 - Movie review [different kinds of movies can be suggested too for practice]  Topic 3 – Another Movie review  Topic 4 – Hotel / Café / Recreations centre Review  Topic 5 – Electronic Gadget Review (Laptop/smart phone / speakers/ PSP/ etc.)</p> <p>What is a review? How to write a review. Different types of reviews.</p> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Writing for Social Media</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Writing for social media: Facebook, Inked-in</li> <li>• Points to remember while writing on the social media. How to write Profile summary.</li> <li>• What is a blog? How to write a blog?</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Presentations &amp; Miscellaneous</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Formal Informal</li> <li>• Debate</li> <li>• Discussions</li> <li>• Pick &amp; Speak</li> </ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <p>Usage of Phrases &amp; Idioms</p> <p>Revision of English I &amp; II</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Practical English Usage	Michel Swan	Oxford University Press
2.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English		South Asian edition), Cambridge University Press
3.	Learn Correct English: Grammar, Usage and Composition	Shiv K. Kumar & Hemalatha Nagarajan	Pearson, New Delhi, India
4.	Grammar of the Modern English Language	Sukhdev Singh & Balbir Singh	Foundation Books, New Delhi
5.	Communicative English for Engineers and Professionals	Nitin Bhatnagar and Mamta Bhatnagar	Pearson( New Delhi)
6.	Communicative grammar and composition	Rajesh.K.Lidiya	Oxford Univ Press, New Delhi.

<b>Code: BMC02209</b>	<b>LIFE &amp; CAREER SKILLS-I</b>	<b>1 Credit [LTP: 0-0-2]</b>
-----------------------	-----------------------------------	------------------------------

• **LIST OF ACTIVITIES**

<b>Part - A</b>	
1.	Self-Introduction & knowing your environment
2.	GOAL Setting &Planning
3.	Time Management & Team Work
4.	Personal Grooming and Body language
5.	Etiquettes (Personal, Social, Professional & Corporate) etiquettes
6.	Reading skills: General & Technical Articles
<b>Part - B</b>	
7.	Listening Skills: Analysis of videos by famous Personalities
8.	Writing Skills: Picture perception & Story Making by jumbled words
9.	Speaking Skills: Extempore, JAM & Me against myself
10.	Role Plays
11.	Resume Writing
12.	Group Discussion



**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-II shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the SECOND Semester are as follows:

Code	Activity	Hours	Credits
BMC02610.1	Online Eligibility Exam (OLE)	1	0.5
BMC02610.2	Campus Recruitment Training (CRT) -Introduction to Public Speaking	3	
BMC02610.3	Online Certification Courses	-	

# POORNIMA UNIVERSITY, JAIPUR

## BCM (MA & IS) First Year

### Teaching Scheme for First Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCM01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCM01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCM01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCM01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BCM01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCM01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCM01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCM01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCM01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCM01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

POORNIMA UNIVERSITY, JAIPUR										
BCM (MA & IS) First Year										
Teaching Scheme for Second Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCM02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCM02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCM02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCM02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCM02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCM02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCM02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BCM02610.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	16				23.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & IS) Second Year

### Teaching Scheme for Third Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM03101	Advanced Java Programming	4	-	-	40	60	100	4	Theory	Core Course
BCM03102	Database Management System	3	-	-	40	60	100	3	Theory	Core Course
BCM03103	Object Oriented Analysis and Design	3	-	-	40	60	100	3	Theory	Core Course
BCM03204	Advance Java Programming Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM03205	Database Management System Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM03106.1	Cryptography Fundamentals	3	-	-	40	60	100	3	Theory	Departmental Elective: ANYONE
BCM03106.2	Network Security				40	60	100		Theory	
BSE03151	Fundamentals of IoT and its Applications	3	-	-	40	60	100	3	Theory	Open Elective (School Level) ANYONE
BSE03152	Introduction to Animation and Photography				40	60	100		Theory	
BSE03153	Python Programming				40	60	100		Theory	
BSE03154	Blockchain Fundamentals				40	60	100		Theory	
BSE03155	Big Data Analytics				40	60	100		Theory	
BSE03156	Introduction to Digital Marketing				40	60	100		Theory	
BCM03313	Summer Project	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCM03414	Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCM03215	Personality Development	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM03216	Life & Career Skills-II	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM03617	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM03617.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BCM03617.2	Non Syllabus Project (NSP)	1	-	-	-	-	-			
BCM03617.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	16				24.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & IS) Second Year

### Teaching Scheme for Fourth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM04101	Enterprise Application Development	3	-	-	40	60	100	3	Theory	Core Course
BCM04102	Information Security	3	-	-	40	60	100	3	Theory	Core Course
BCM04103	Introduction to Android Application Development	4	-	-	40	60	100	4	Theory	Core Course
BCM04204	Enterprise Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM04205	Introduction to Android Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM04106.1	Application Security	3	-	-	40	60	100	3	Theory	Departmental Elective: ANYONE
BCM04106.2	Database Security				40	60	100		Theory	
	Annexure 1	3	-	-	40	60	100	3	Theory	Open Elective
BCM04407	Industrial Training Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCM04208	Logical Reasoning and Thinking		-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM04209	Life & Career Skills-III	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM04610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM04610.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BCM04610.2	Non Syllabus Project (NSP)	1	-	-	-	-	-			
BCM04610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>14</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>33</b>								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & IS) Third Year

### Teaching Scheme for Fifth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM05101	Professional Android Application Development	4	-	-	40	60	100	4	Theory	Core Course
BCM05102	Ethical Hacking	4	-	-	40	60	100	4	Theory	Core Course
BCM05103	Cross Platform Application Development	4	-	-	40	60	100	4	Theory	Core Course
BCM05204	Professional Android Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM05205	Ethical Hacking Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM05206	Cross Platform Application Development Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM05107.1	Mobile Security	3	-	-	40	60	100	3	Theory	Departmental Elective
BCM05107.2	Digital Forensics				40	60	100		Theory	
BCM05208	Life & Career Skills-IV	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM05609	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM05609.1	Campus Recruitment Training/OLE	3	-	-	-	-	-			
BCM05609.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BCM05609.3	Online Certification Courses	-	-	-	-	-	-			
	Total	18	0	15				22.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA (MA & IS) Third Year

### Teaching Scheme for Sixth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM06301	Major Project / Internship	-	-	12	60	40	100	12	Practical	Skill Enhancement Course
BCM06602	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	-	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM06602.1	Campus Recruitment Training/OLE	-	-	-	-	-	-	-		
BCM06602.2	Non Syllabus Project (NSP)	-	-	-	-	-	-	-		
BCM06602.3	Online Certification Courses	-	-	-	-	-	-	-		
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>12</b>				<b>12</b>		
	<b>Total Teaching Hours</b>	<b>12</b>								

Summary Sheet for Teaching Scheme (Credits)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Total Credits
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	13	4	-	-	6	1	-	1	0.5	25.5
II	13	6	-	-	3	-	-	1	0.5	23.5
III	10	4	3	3	-	2	-	2	0.5	24.5
IV	10	4	3	3	-	1	-	2	0.5	23.5
V	12	6	3	-	-	-	-	1	0.5	22.5
VI	-	-	-	-	-	12	-	-	-	12
Total	58	24	9	6	9	16		7	2.5	131.5

Summary Sheet for Teaching Scheme (Subjects)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Remarks
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	4	2	-	-	2	1	-	1	3	-
II	4	3	-	-	1	-	-	1	3	-
III	3	2	2	6	-	2	-	2	3	School Level Open Elective
IV	3	2	2	25	-	1	-	2	3	University Level Open Elective
V	3	3	2	-	-	-	-	1	3	-
VI	-	-	-	-	-	1	-	-	3	Internship for 6 months
Total	17	12	6	31	3	5	0	7	18	99



## Annexure - I

### Open Elective Courses at University Level in IV Semester (For All Schools)

Sr. No.	Course Code	Course Name	Teaching Department
1	BOE04111	Industrial Psychology and Sociology	Mechanical Engineering
2	BOE04112	Total Quality Management	Mechanical Engineering
3	BOE04113	Project Management	Mechanical Engineering
4	BOE04114	Logistics and Supply Chain Management	Mechanical Engineering
5	BOE04115	Basics of Petro Industry	Mechanical Engineering
6	BOE04116	Nano Science and Technology	Electrical & Electronics Engineering
7	BOE04117	Non Conventional Energy Sources	Electrical & Electronics Engineering
8	BOE04118	Introduction to Soft Computing	Electrical & Electronics Engineering
9	BOE04119	IPR and Patents	Electrical & Electronics Engineering
10	BOE04120	Artificial intelligence	Electrical & Electronics Engineering
11	BOE04121	E-commerce	Computer Engineering
12	BOE04122	Management Information System (MIS)	Computer Engineering
13	BOE04123	IT Act and Cyber Law	Computer Engineering
14	BOE04124	Python	Computer Engineering
15	BOE04125	Basics of UX/UI Design	Computer Engineering
16	BOE04126	Values and Professional Ethics	SMC
17	BOE04127	Digital Marketing	SMC
18	BOE04128	Business Research	SMC
19	BOE04129	Basics of Economics	SMC
20	BOE04130	Entrepreneurship	SMC
21	BOE04131	Essentials of Management	SMC
22	BOE04132	Organizational Behaviour& Cyber Law	SMC
23	BOE04133	Disaster Management	SPA
24	BOE04134	Foreign Language French & Japanese	SPA
25	BOE04135	Creative Thinking	SDA



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

# BCA

## MA & IS

### Batch 2019-22

# BCA- MA & IS



July 2019

Teaching Scheme for  
BCA – MA & IS  
Detailed Syllabus for  
I & II SEM

POORNIMA UNIVERSITY, JAIPUR										
BCM (MA & IS) First Year (2019-2022)										
Teaching Scheme for First Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BCM01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BCM01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BCM01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BCM01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BCM01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCM01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BCM01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BCM01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCM01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BCM01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

POORNIMA UNIVERSITY, JAIPUR										
BCM (MA & IS) First Year (2019-2022)										
Teaching Scheme for Second Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BCM02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BCM02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BCM02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BCM02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BCM02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BCM02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BCM02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BCM02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BCM02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BCM02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BCM02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BCM02610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**

**MA & IS**

**Batch 2019-22**

**BCA- MA & IS**



**Teaching Syllabus  
for  
I Sem.**

## CORE THEORY SUBJECTS

Code: BCM01101

PROGRAMMING FUNDAMENTALS USING C

3 Credits [LTP: 3-0-0]

### COURSE OUTCOME:

Even with the introduction of several high level languages and frameworks, the development of procedural codes is important in several commercial app developments. The object oriented platforms and event driven systems use procedural languages for coding integral command content.

C is an important procedural language and was developed initially to write the UNIX operating system. UNIX operating system, C compiler and all UNIX application programs are written in C. C is popular because, it is easy to learn, produces efficient programs, can handle low-level activities, and can be compiled on a variety of platforms.

This unit focuses on all the basic concepts, syntax and constructs of the C language. For students, who are new to programming, this unit can be considered as the starting point before taking up any other programming oriented units. The students will be implementing the concepts explained here to create simple to complex programs.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Overview of Programming	6
2.	Fundamentals of C programming	6
3.	Advanced programming techniques	8
4.	Dynamic data structures in C	8
5.	Additional features	8

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	Overview of Programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Introduction to computer based problem solving</b>, Program design and implementation issues- Flowcharts &amp; Algorithms, Top down design &amp; stepwise refinement</li><li><b>Programming environment</b> – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters.</li><li>Conclusion of the Unit</li></ul>
2.	Fundamentals of C programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Overview of C</b>, Data Types, Constants &amp; Variables, Operators &amp; Expressions</li><li><b>Control constructs</b>-if then, for, while, <b>Arrays</b>- single &amp; multidimensional arrays</li><li><b>Functions</b>-fundamentals – general form, function arguments, return value</li><li><b>Basic I/O</b>-formatted and Unformatted I/O, <b>Advanced features</b>- Type modifiers and storage class specifies for data types, Bit operators, Operator, &amp;operator, * operator, Type casting, type conversion.</li><li>Conclusion of the Unit</li></ul>
3.	Advanced programming techniques



	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Control constructs</b>- Do while, Switch statement, break and continue, exit() function, go to and label</li> <li>• <b>Scope rules</b>- Local &amp; global variables, scope rules of functions</li> <li>• <b>Functions</b>-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi.</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Dynamic data structures in C</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Pointers</b>- The &amp; and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function returning pointers</li> <li>• <b>Structures</b>- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures</li> <li>• <b>Unions</b> – Declaration, uses, enumerated data-types, typedef.</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Additional features</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>File Handling</b> – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf</li> <li>• <b>C Preprocessor</b>- #define, #include, #undef, Conditional compilation directives.</li> <li>• <b>C standard library and header files</b>: Header files, string functions, mathematical functions, Date and Time functions.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Let us C, 6 <sup>th</sup> Edition	Yashwant Kanetka	PBP Publication
2.	The C programming Language	Richie and Kenninghan	BPB Publication,2004
3.	Programming in ANSI C 3 <sup>rd</sup> Edition, 2005	Balaguruswamy	Tata McGraw Hill

## COURSE OUTCOME:

- To understand and the use of basic concepts of Computer components.
- To understand the concept of memory hierarchy and the use of various input-output devices.
- To understand the various computer languages, operating system functions and the application of number systems.
- To understand the basic Computer Networking principles and the applications of WWW, multimedia and the usage of electronic mail.

## A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	<b>Register Transfer and Micro-operation</b>	8
2.	<b>Basic Computer Organization</b>	8
3.	<b>Micro Programmed Control Unit</b>	8
4.	<b>Computer Arithmetic</b>	6
5.	<b>Modes of Data Transfer and Memory Organization</b>	6

## B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Register Transfer and Micro-operation</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer.</li> <li>• Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor,</li> <li>• Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Basic Computer Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Instruction Codes, Computer Registers: Common bus system, Computer Instructions:</li> <li>• Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions.</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Micro Programmed Control Unit</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines.</li> <li>• Design of Control Unit, Central Processing Unit: Introduction, General Register Organization,</li> <li>• Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes.</li> <li>• Conclusion of Unit</li> </ul>
4.	<b>Computer Arithmetic</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Addition and Subtraction,</li> <li>• Multiplication Algorithms (Booth algorithm), Division Algorithms,</li> </ul>



	<ul style="list-style-type: none"> <li>• Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors.</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Modes of Data Transfer and Memory Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Modes of Data Transfer: Priority Interrupt, Direct Memory Access,</li> <li>• Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory,</li> <li>• Associative Memory, Cache Memory, Virtual Memory</li> <li>• Conclusion of unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Computer System Architecture	Morris Mano	PHI
2.	Computer Organization and Architecture	William Stallings	PHI
3.	Digital Computer Electronics:	An Introduction to Microcomputers by Malvino	TMH

**COURSE OUTCOME:**

Web Technology has revolutionized mankind and entirely changed the way we look at things. Banking, Education, Retailing, Manufacturing and Research are some of the things that have undergone major transformations due to influence from web development. By adding more features, increasing the scope and reach of industries, making it available to users irrespective of their geography, web has captivated the human minds. Learning web technology is one of the top priorities for every computer enthusiast in order to better understand its working and scope. Students will understand the fundamental working technology behind web development and HTML. They will be taught concepts like JS, HTML5 thus making them capable of web development.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to the Internet and the World Wide Web	8
2.	HTML & CSS	8
3.	XML and HTML5, CSS3	8
4.	PHP Server side scripting	6
5.	Practical website development	6

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to the Internet and the World Wide Web</b>
	<ul style="list-style-type: none"> <li>Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture</li> <li>Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development.</li> <li>HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST</li> </ul>
2.	<b>HTML &amp; CSS</b>
	<ul style="list-style-type: none"> <li>Introduction to Html, Html Document structure, Html Editors, Html element/tag &amp; attributes, Designing simple page - Html tag, Head tag, Body tag;</li> <li>More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.</li> <li>Introduction to CSS, Syntax, Selectors ,Embedding CSS to Html, Formatting fonts, Text &amp; background colour, Inline styles, External and Internal Style Sheets, Borders &amp; boxing</li> </ul>
3.	<b>XML and HTML5, CSS3</b>
	<ul style="list-style-type: none"> <li>Introduction to XML, Difference b/w Html &amp; XML, XML editors, XML Elements &amp; Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.</li> <li>Introduction to HTML5, CSS3, New features, Local storage, Web Sockets, Server events, Canvas, Audio &amp; Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers</li> </ul>
4.	<b>PHP Server side scripting</b>
	<ul style="list-style-type: none"> <li>Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays Strings,</li> <li>Environment &amp; environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.</li> </ul>
5	<b>Practical website development</b>

	<ul style="list-style-type: none"> <li>• Commonly used Web Servers and browsers, Setting up a server and domain name, website types and structures,</li> <li>• Web authoring tools, Web hosting, website maintenance, generating traffic to your website.</li> </ul>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Book	Author	Publication
<b>a. Reference Books</b>			
1.	Practical Web Design for Absolute Beginners	Adrian W. West	Apress 2016
2.	Introducing Web Development	Jorg Krause	Apress 2017
3.	HTML & CSS: The Complete Reference	Thomas Powell	McGraw Hill, Fifth Edition, 2010
4.	Creating a Website: The Missing Manual	Mathew Macdonald. O'Reilly	3rd Edition

**COURSE OUTCOME:**

- To learn fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skewness and kurtosis.
- To solve problems on theory of probability, linear programming problems, transportation, assignment and game problems.
- To learn important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications..

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Basic Statistics	8
2.	Probability Distribution	10
3.	Regression	10
4.	Sample introduction, Sampling	10
5.	T-Test	10

**B. DETAILED SYLLABUS**

Unit	Unit Details Regression
1.	<b>Basic Statistics</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Preparing Frequency Distribution Table and Cumulative frequency, Measure of Central Tendency, Types: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.</li> <li>• Measure of Dispersion: Range, Quartile Deviation, mean deviation, Coefficient of mean Deviation, Standard Deviation</li> <li>• Moments: Moments About mean, Moments about any point, Moment about origin, Moment about mean in terms of moment about any point, Moment about any point in terms of Moment about mean.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Probability Distribution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Random Variable- Discrete Random and Continuous Random variable, Probability Distribution of a Random Variable, Mathematical Expectation</li> <li>• Types: Binomial, Poisson, Normal Distribution, Mean and Variance of Binomial, Poisson, and Normal Distribution.</li> <li>• Correlation: Introduction, Types, Properties, Methods of Correlation: Karl Pearson's Coefficient of Correlation, Rank Correlation and Concurrent Deviation method, Probable error</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Regression</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Aim of Regression Analysis, Types of Regression Analysis, Lines of Regression, Properties of Regression Coefficient and Regression Lines, Comparison with Correlation.</li> </ul>

	<ul style="list-style-type: none"> <li>• Curve Fitting: Straight Line, Parabolic curve, Geometric Curve and Exponential Curve Baye's Theorem in Decision Making, Forecasting Techniques</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Sample introduction, Sampling</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Meaning, methods of Sampling, Statistical Inference: Test of Hypothesis, Types of hypothesis, Procedure of hypothesis Testing, Type I and Type II error,</li> <li>• One Tailed and two tailed Test, Types of test of Significance: Test of significance for Attribute-Test of No. of success and test of proportion of success</li> <li>• Test of significance for large samples - Test of significance for single mean and Difference of mean, Test of significance for small samples</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>T-Test</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Test the significance between the mean of a random sample, between the mean of two independent samples.</li> <li>• Chi square Test, ANOVA: Meaning, Assumptions, One way classification, ANOVA Table for One-Way Classified Data</li> <li>• Conclusion of unit</li> </ul>

#### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Fundamentals of Applied statistics	Gupta S.P. and Kapoor	Sultan Chand & Sons, 1996.
2.	Introduction to Statistics	Graybill,	McGraw

# Practicals

Code: BCM01205

PROGRAMMING FUNDAMENTALS USING C LAB

2 Credits [LTP: 0-0-5]

## A. List of Programs

Part A	
	<ol style="list-style-type: none"><li>1. Find biggest number among 4 given numbers</li><li>2. Printing the reverse of an integer.</li><li>3. Printing the odd and even series of N numbers.</li><li>4. Input a string and find the number of each of the vowels appear in the string.</li><li>5. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li><li>6. Printing the reverse of a string.</li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Searching an element in an array using pointers.</li><li>8. Checking whether the given matrix is an identity matrix or not</li><li>9. Addition and subtraction of two matrices.</li><li>10. Multiplication of two matrices.</li><li>11. Print the following:</li><li>12. Reverse of an integer.</li><li>13. Odd and even series of N numbers.</li><li>14. Get a string and convert the lowercase to uppercase and vice-versa using getchar() and putchar().</li><li>15. Perform the following:</li><li>16. Input a string and find the number of each of the vowels appear in the string</li><li>17. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li></ol>

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. 1. Hello World Web Page               <ol style="list-style-type: none"> <li>a) Create a web page using basic HTML features like tags, attributes, elements and page title.</li> <li>b) How to install, and configure a web server</li> </ol> </li> <li>2. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) A more functional web page by making use of headings, paragraphs, lists, images and links.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Use different font styles.</li> <li>ii. Set background image for both the page and single elements on the page.</li> </ol> </li> </ol> </li> <li>3. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) Using textboxes, check boxes, radio buttons and submit buttons.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Control the repetition of image with background-repeat property.</li> <li>ii. Define style for links as a: link, b: active, c: hover, d: visited.</li> <li>iii. Add customized cursors for links.</li> </ol> </li> </ol> </li> <li>4. Create XMLHttpRequest and retrieve data from a text file and an XML file.</li> <li>5. Create the following webpage:               <ol style="list-style-type: none"> <li>a) Show the class timetable in a tabular format.</li> <li>b) Create a webpage using HTML to show your geolocation.</li> </ol> </li> <li>6. Create a webpage using HTML for audio and video player.</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Create a login registration form using PHP.</li> <li>8. Develop a PHP webpage to manipulating files such as creating, writing, reading and uploading.</li> <li>9. Create a dynamic webpage by using PHP conditional operators, loops and strings to create an dynamic timetable page.</li> <li>10. Develop a PHP web application track the user as how many times visited and last visited time</li> <li>11. Develop a static website – I.</li> <li>12. Develop a dynamic website –II</li> </ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCM01107**

**ENGLISH-I**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

### **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Everyday Conversations	8
2.	Asking for..	7
3.	Reporting/ Describing	7
4.	Meeting People	7
5.	Expressing & Talking about....	7

### **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Everyday Conversations</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Introducing self / others</li><li>• Weather</li><li>• Classroom</li><li>• Asking about facilities around</li><li>• Describing a person / thing</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
2.	<b>Asking for..</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Help/ Suggestion/ ideas</li><li>• Clarification/ Directions</li><li>• Time/ food</li><li>• Advice</li><li>• Uses</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
3.	<b>Reporting/ Describing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Incidences</li><li>• Personalities</li><li>• Experiences</li><li>• Wants/Needs</li><li>• Intentions</li></ul>



	<ul style="list-style-type: none"> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Meeting People</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Greetings</li> <li>• Starting the Conversation</li> <li>• Small talks</li> <li>• Closing the conversation</li> <li>• Points to cover: Vocabulary, Grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheet</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Expressing &amp; Talking about....</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Happiness/Displeasure</li> <li>• Preferences</li> <li>• Doubts</li> <li>• Views</li> <li>• Unawareness</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Interests</li> <li>• Different Cultures, Clothes, cars, institutes, situations</li> <li>• Schedules, prices</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Speak Now Level I & II	Jack C Richards & David Bohlke	Oxford Press
2.	Business Benchmark, Level –	Guy Brook-Hart	Upper Intermediate by Cambridge University Press
3.	Practical English Usage	Michel Swan	Oxford University Press
4.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English	Ronald Carter, Michael McCarthy	(South Asian edition), Cambridge University Press

**COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Communication Process	6
2.	Types of Communication & Barriers to communication	5
3.	Listening Skills & Reading Skills	5
4.	Conversation Skills	4
5.	Telephone Etiquette	4

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Communication Process</b>
	<ul style="list-style-type: none"> <li>What is communication?</li> <li>The communication model</li> <li>Elements of communication</li> <li>Importance of effective communication skills in the business world</li> <li>Components of Communication</li> <li>Process, practicing effective communication, good communication Vs effective communication, styles of communication, intercultural communication skills- need for attitude change and benefits</li> </ul>
2.	<b>Types of Communication &amp; Barriers to communication</b>
	<ul style="list-style-type: none"> <li>Verbal Communication</li> <li>Non Verbal Communication</li> <li>Written Communication</li> <li>Do's and don'ts of each type</li> <li>Barriers to effective communication and how to overcome them</li> <li>Interaction of verbal and non-verbal communication, talents of a corporate communicator, silence- merits and limitations of each type</li> </ul>
3.	<b>Listening Skills &amp; Reading Skills</b>
	<ul style="list-style-type: none"> <li>What is listening</li> <li>Various types of listening – Active, passive, selective, listening and note taking, listening and comprehending, listening to speak,</li> <li>Principles of good listening</li> <li>Techniques to develop effective listening skills</li> <li>Reading Skills- skimming, scanning and inferring- common reading techniques,</li> <li>Practicing smart reading.</li> </ul>
4.	<b>Conversation Skills</b>
	<ul style="list-style-type: none"> <li>Importance of conversation skills</li> <li>Features of a good conversation</li> <li>Tips to improve Conversation skills</li> </ul>

	<ul style="list-style-type: none"> <li>• Importance of questioning skills, techniques to ask right questions- role play situations to practice the same, discussing issues (social, political and cultural), formal and informal conversation</li> </ul>
<b>5.</b>	<b>Telephone Etiquette</b>
	<ul style="list-style-type: none"> <li>• Basic rules of telephone etiquette- formal vs. informal; tone, pitch and vocabulary related to formal ways of speaking over the phone, leaving voice messages; practice sessions (role plays)</li> <li>• <b>Persuasive communication</b> :What is persuasive communication, different techniques of persuasive communication, How to negotiate using persuasive communication, the act of negotiation, negotiation style and their contexts, fundamentals of negotiation, common hurdles in negotiation and how to overcome them</li> </ul>

**COURSE OUTCOME:**

The student would be able:

- To acquire the knowledge of environmental studies and understand the principles of ecology and environmental issues.
- To distinguish & analyze different water treatment methods and conservation of water.
- To design innovative ideas for controlling air, noise & soil pollution.
- To develop deeper knowledge in the problems and possibilities of waste management from a national and global perspective and demonstrate socio-economic skills for sustainable development.
- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Environmental studies	6
2.	Ecology	8
3.	Natural & Biological Resources	8
4.	Social Issues	7
5.	Environmental Pollution	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1	<b>Environmental studies</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Scope</li> <li>• Importance &amp; components</li> <li>• Natural and Manmade.</li> <li>• Conclusion of the Unit</li> </ul>
2	<b>Ecology</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Concept</li> <li>• Structure and Functions of Ecosystem</li> <li>• Biotic and A biotic Factors</li> <li>• Environmental Interactions.</li> <li>• Defining Communication Theories.</li> <li>• Conclusion of the Unit</li> </ul>
3	<b>Natural &amp; Biological Resources</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Plants</li> <li>• Animal and Microorganisms.</li> <li>• Conclusion of the Unit</li> </ul>
4	<b>Social Issues</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Human Population</li> <li>• Environment</li> </ul>

	<ul style="list-style-type: none"> <li>• Conclusion of the Unit</li> </ul>
<b>5</b>	<b>Environmental Pollution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Cause</li> <li>• Effects</li> <li>• Types and Control Measures</li> <li>• Conservation and preservation of Environment.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Reference Book	Author	Edition	Publication
1.	Environmental Studies	Erach Barucha	Latest	UGC
2.	Environmental Studies	Benny Joseph	Latest	Tata McgrawHill
3.	Environmental Studies	R. Rajagopalan	Latest	Oxford University Press
4.	Principles of Environmental Science and Engineering	P. Venugoplan Rao	Latest	Prentice Hall of India.
5.	Environmental Science and Engineering	Meenakshi	Latest	Prentice Hall India.
<b>Important Web Links</b>				
1.	<a href="http://www.ct.gov/">http://www.ct.gov/</a>			
2.	<a href="http://www.energy.gov">http://www.energy.gov</a>			

## Skill Enhancement Courses (SEC)

**Code: BCM01210**

**OFFICE AUTOMATION LAB**

**1 Credit [LTP: 0-0-2]**

### A. List of Programs

1	Installing Operating Systems and Basic Software
	<b>MS Word</b>
	<ol style="list-style-type: none"> <li>1. Prepare a document about any tourist destination of your choice with appropriate pictures and editing features.</li> <li>2. Prepare a News Paper Layout. Insert appropriate pictures wherever necessary. Use the following Features: <ul style="list-style-type: none"> <li>• Three Column and Four Column setting</li> <li>• Set One or Two Advertisements</li> <li>• Use Bullets and Numbering.</li> </ul> </li> <li>3. Create a Document consisting of Bio-data. It includes <ul style="list-style-type: none"> <li>• A table giving your qualification and/or experience of work. Table should be Bordered and Shaded.</li> <li>• A Multilevel list giving your areas of interest and further areas of interest. The sub areas should be numbered as</li> <li>• 'a', 'b', etc while the areas should be numbered as '1', '2', etc.</li> <li>• The information should be divided in “General” and “Academic” sections.</li> <li>• The header should contain “BIO-DATA” while the footer should have page numbers in the format Page 1 of 10.</li> <li>• Assign a password for the document to protect it from unauthorized access.</li> </ul> </li> <li>4. Assume that you are coordinating a seminar in your organization. Write a letter to 10 different IT companies asking them to participate in the seminar using mail merge facility.</li> <li>5. Prepare a document which contains template of marks card of students. Assume that there are 10 students. The footer for the document should be 'Poornima University Jaipur'.</li> <li>6. Prepare a document about any topic In mathematics which uses mathematical symbols. (At least 5 mathematical symbols should be used). Assign a password for the document to protect it from unauthorized access. Demonstrate the use of Hyperlink Option. Sets margins to your document, a font of size and double spaced document</li> </ol>
	<b>MS – Excel</b>
	<ol style="list-style-type: none"> <li>7. Open a new workbook, save it as JavaCoffeeBar.xls. In sheet1 write following sales data for Java Coffee bar to show their first 6 months sales.</li> </ol>

	<ul style="list-style-type: none"> <li>• Select cell B4:D4 and change the horizontal alignment to center and text to 90 degree.</li> <li>• All titles should be in bold</li> <li>• Format all cells numbers to currency style and adjust width as necessary.</li> <li>• Add border to data.</li> <li>• Select the cell range A1:H1, merge and center these cells. Apply same format to A2:H2.</li> <li>• Give border, shading and pattern to data in sheet</li> <li>• Apply different font settings for all titles in sheet</li> <li>• Apply green color and bold setting to sales above 10000 (use conditional formatting)</li> <li>• Rename current worksheet as FirstHalfSales</li> </ul> <p>8. Prepare a worksheet to maintain student information. The work sheet should Contain Roll Number, Name and marks in 5 subjects. (Max Marks is 100). Validate the marks. Calculate the total marks. Assign the grade according to the following. Assign grade 'A' if the total marks is above 450. From 401 to 449 assign the grade as 'B'. From 351 to 400 assign the Grade as 'C'. From 300 to 350 the grade to be assigned is 'D'. For the total marks less than 300 No grade is assigned. A student is eligible to get a grade only when he gets 40 and above in all the subjects. In such cases the grade is "FAIL". (Assume that there are 10 students)</p> <p>9. Prepare a pay-bill using a worksheet. The work sheet should contain Employee Id, Name, Designation, Experience and Basic Salary and Job ID. If Job Id is 1 then DA is 40% of the basic salary. HRA is Rs. 4500. If Job Id is 2 then DA is 35% of the basic salary. HRA is Rs. 3500. If Job Id is 3 then DA is 30% of the basic salary. HRA is Rs. 2500. If Job Id is 4 then DA is 25% of the basic salary and HRA is RS.2500. For all the other Job ids DA is 20% of the basic salary and HRA is Rs. 1500. For all the above Job ids PF to be deducted is 4%. For the job ids between 1-4 Rs. 100 to be deducted as Professional Tax. Find the net pay.</p> <p>10. For the above employee worksheet perform the following operations</p> <ul style="list-style-type: none"> <li>• Use filter to display the details of employees whose salary is greater than 10,000.</li> <li>• Sort the employees on the basis of their net pay</li> <li>• Use advance filter to display the details of employees whose designation is "Programmer" and Net Pay is greater than 20,000 with experience greater than 2 yrs</li> </ul> <p>11. Using Excel project the Product sales for any five products for five years.</p> <ul style="list-style-type: none"> <li>• Compute the total sales of each product in the five years.</li> <li>• Compute the total sales of all the products in five year.</li> <li>• Compute the total sales of all products for each year.</li> <li>• Represent annual sale of all the products using Pie-Chart.</li> <li>• Represent annual sales of all products using Bar Chart.</li> <li>• Represent sale of a product for five years using Pie-Chart.</li> <li>• Label and format the graphs</li> </ul> <p>12. Create a statement of Telephone Bill Charge for a customer.</p> <ul style="list-style-type: none"> <li>• Telephone Calls</li> <li>• Up to 150 calls- free</li> <li>• 151 to 500 calls- 0.80 per call</li> <li>• 501 to 1000 calls- 1.00 per call</li> <li>• 1001 to 2000 - 1.25 per call</li> <li>• Above 2000- 1.40 per call</li> </ul> <p>13. Perform Following:</p> <ul style="list-style-type: none"> <li>• Using Excel write sales data with columns product, month and sales. Write at least 5 records. Create Pivot Table chart and Report for the data.</li> </ul>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<ul style="list-style-type: none"> <li>• Create a macro to change the name of worksheet as Macro Example, merge first three columns of first row and write heading as DATA in green color with yellow background</li> <li>• Link word document in excel worksheet to show the usage of linking and embedding.</li> </ul>
	<b>MS - PowerPoint</b>
	<p>14. Assume that you are going to give a presentation about Information Technology. (Choose some latest technologies). The presentation should have minimum 10 slides. Insert appropriate images wherever necessary. Use proper formatting, Diagrams and tables. Show the usage of action buttons, hyperlinks, and animations.</p>



**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-I shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the FIRST Semester are as follows:

Code	Activity	Hours	Credits
BCM01611.1	Online Eligibility Exam (OLE)	1	0.5
BCM01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	
BCM01611.3	Online Certification Courses	-	



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**

**MA & IS**

**Batch 2019-22**

**BCA- MA & IS**



**Teaching Syllabus  
for  
II Sem.**

## CORE THEORY SUBJECTS

**Code: BCM02101**

**COMPUTER NETWORKS**

**3 Credits [LTP: 3-0-0]**

### COURSE OUTCOME:

It is important for networking professionals to have a sound grounding in the basics of networking and with the networking technology being developed thick and fast, the professionals need to be updated of them at all times. The focus of this unit is providing a background to the basics of networking and its underlying principles.

This course will explore the fundamentals of networking, the principle and purpose behind layered models, devices used in networks and their wireless connectivity and the ways to troubleshoot network related issues. The unit underpins the principles of networking and enables the learners to work towards taking up vendor certifications in the networking domain. To enable students to understand computer networking concepts, how they work, how they operate and the protocols, standards and the models associated with networking technology and their troubleshooting mechanisms.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Networking Fundamentals	8
2.	Basics of Network Devices	7
3.	Basics of Network, Transport and Application Layers	7
4.	WAN Technology	7
5.	Network Operating Systems and Troubleshooting Network	7

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Networking Fundamentals</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Basics of Network &amp; Networking, Advantages of Networking, Types of Networks</li><li>• Network Terms- Host, Workstations, Server, Client, Node</li><li>• Types of Network Architecture- Peer-to-Peer &amp; Client/Server, Workgroup Vs. Domain</li><li>• Network Topologies, Types of Topologies, Logical and physical topologies, selecting the Right Topology</li><li>• Types of Transmission Media, Communication Modes, Wiring Standards and Cabling- straight through cable, crossover cable, rollover cable, media connectors (Fibre optic, Coaxial, and TP etc.)</li><li>• Introduction of OSI model, Seven layers of OSI model, Functions of the seven layers, Introduction of TCP/IP Model, TCP, UDP, IP, ICMP, ARP/RARP, Comparison between OSI model &amp; TCP/IP model</li><li>• Overview of Ethernet Addresses</li><li>• Conclusion of the Unit</li></ul>
2.	<b>Basics of Network Devices</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Network Devices- NIC- functions of NIC, installing NIC, Hub, Switch, Bridge, Router, Gateways, And Other Networking Devices, Repeater, CSU/DSU, and modem</li><li>• Data Link Layer: Ethernet, Ethernet standards, Ethernet Components, Point-to-Point Protocol (PPP ),PPP standards, Address Resolution Protocol, Message format, transactions</li></ul>

	<ul style="list-style-type: none"> <li>• Wireless Networking: Wireless Technology, Benefits of Wireless Technology</li> <li>• Types of Wireless Networks: Ad-hoc mode, Infrastructure mode</li> <li>• Wireless network Components: Wireless Access Points, Wireless NICs</li> <li>• wireless LAN standards: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, wireless LAN modulation techniques</li> <li>• wireless security Protocols: WEP, WPA, 802.1X, Installing a wireless LAN</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Basics of Network, Transport and Application Layers</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Layer: Internet Protocol (IP ), IP standards, versions, functions, IPv4 addressing, IPv4 address Classes, IPv4 address types, Subnet Mask, Default Gateway, Public &amp; Private IP Address, methods of assigning IP address, IPv6 address, types, assignment, Data encapsulation, The IPv4 Datagram Format, The IPv6 Datagram Format, Internet Control Message Protocol (ICMP ), ICMPv4, ICMPv6, Internet Group Management Protocol (IGMP ), Introduction to Routing and Switching concepts</li> <li>• Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports &amp; Sockets</li> <li>• Application Layer: DHCP, DNS, HTTP/HTTPS, FTP, TFTP, SFTP, Telnet, Email: SMTP, POP3/IMAP, NTP</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>WAN Technology</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• What Is a WAN?, WAN Switching, WAN Switching techniques Circuit Switching, Packet Switching etc., Connecting to the Internet : PSTN, ISDN, DSL, CATV, Satellite-Based Services, Last Mile Fiber, Cellular Technologies</li> <li>• Connecting LANs : Leased Lines, SONET/SDH, Packet Switching, Remote Access: Dial-up Remote Access, Virtual Private Networking, SSL VPN, Remote Terminal Emulation, Network security: Authentication and Authorization, Tunneling and Encryption Protocols, IPSec, SSL and TLS, Firewall, Other Security Appliances, Security Threats</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Network Operating Systems and Troubleshooting Network</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Operating Systems: Microsoft Operating Systems, Novell NetWare, UNIX and Linux Operating Systems, Macintosh Networking</li> <li>• Trouble Shooting Networks: Command-Line interface Tools, Network and Internet Troubleshooting, Basic Network</li> <li>• Troubleshooting : Troubleshooting Model, identify the affected area, probable cause, implement a solution, test the result, recognize the potential effects of the solution, document the solution</li> <li>• Using Network Utilities: ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat, Hardware trouble shooting tools, system monitoring tools</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr. No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1.	CCNA Cisco Certified Network Associate: Study Guide (With CD)	Todd Lamele	7th Edition (Paperback), Wiley India, 2011
2.	CCENT/CCNA ICND1 640-822 Official Cert Guide	Wendell Odom	3 Edition (Paperback), Pearson, 2013
3.	Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD)	Rick Graziani, Allan Johnson	Pearson, 2008
4	CCNA Exploration Course Booklet : Routing Protocols and Concepts	Cisco Networking Academy	Pearson, 2010

**COURSE OUTCOME:**

Object oriented programming is the most proven technique for developing reliable programs. It helps in increased productivity, reusability of code, decreases development time, and reduces cost of production to an extent. The cost of maintaining such systems have also considerably decreased. There are many languages which used the object oriented concepts and techniques. Some of them are C++, Java, Smalltalk, Objective-C, etc.

Java is a purely object oriented language. Systems/applications created using java programming language reduces the need for developing and maintain complex and space consuming applications. Java has a lot of advantages of being simple, robust, platform independent, etc. Nowadays java is also found in the mobile phones. This unit focuses on the concepts of object oriented programming language and the different constructs for creating applications in java.

To provide students with an understanding of the object oriented concepts which helps in the field of programming, management of data, etc. and of Java programming which helps to explore the object oriented nature of the language and the multi-platform versatility offered by it.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Object Oriented Programming	8
2	Basic Java Programming	10
3	Java Packages and Interfaces	10
3	Exceptions and I/O Handling	10
5	User Interface and Advanced Concepts	10

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Object Oriented Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Classes and Objects</li> <li>• Object Oriented Programming Concepts</li> <li>• Access Specifiers and Access Modifiers</li> <li>• Introduction to Java, Java Virtual Machine</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Basic Java Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Variables</li> <li>• Data Types</li> <li>• Control flow statements – if, else, switch, for, while</li> <li>• Arrays</li> </ul>

	<ul style="list-style-type: none"> <li>• Strings</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Java Packages and Interfaces</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Java classes, Java methods, Packages, Interfaces</li> <li>• Java.util, java.io, java.net, java.sql, java.applet, etc</li> <li>• Collection Framework</li> <li>• Generics</li> <li>• Wrapper classes</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Exceptions and I/O Handling</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Errors and Exceptions</li> <li>• Exception handling</li> <li>• Streams, Readers and Writers</li> <li>• Programming with Files</li> <li>• Multithreaded programming</li> <li>• Networking – Socket Programming</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>User Interface and Advanced Concepts</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• User Interface Components</li> <li>• AWT</li> <li>• Swing</li> <li>• Event Handling</li> <li>• Layouts, Forms</li> <li>• Applets</li> <li>• Annotations</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1	Java Complete Reference	Herbert Schildt	TMH
2	SAMS teach yourself Java-2	Rogers Cedenhead and Leura Lemay	3rd Edition, Pub. Pearson Education.

**COURSE OUTCOME:**

A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently. Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks. In this course the student will be learning about different data structures and their applications.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Data structures	7
2	Searching and Sorting	7
3	Stack and Queue	8
4	Linked List	7
5	Tree Graphs and their Applications	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Data structures</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition,</li> <li>• Classification of data structures: primitive and non-primitive</li> <li>• Elementary data organization</li> <li>• Time and space complexity of an algorithm (Examples), String processing.</li> <li>• Definition of dynamic memory allocation</li> <li>• Accessing the address of a variable</li> <li>• Declaring and initializing pointers -</li> <li>• Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: malloc(), calloc(), free() and realloc().</li> <li>• Recursion – Definition, advantages, Writing Recursive programs – Binomial coefficient, Fibonacci, GCD.</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Searching and Sorting</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Basic Search Techniques</b> - Sequential search, Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search.</li> <li>• <b>Sorting</b>: General background and definition - Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort</li> <li>• Conclusion of the Unit</li> </ul>



<b>3.</b>	<b>Stack, and Queue</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Stack – Definition</li> <li>• Array representation of stack</li> <li>• Operations on stack: Infix, prefix and postfix notations</li> <li>• Conversion of an arithmetic expression from Infix to postfix</li> <li>• Applications of stacks.</li> <li>• Definition of queue</li> <li>• Array representation of queue</li> <li>• Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue,</li> <li>• Operations on all types of Queues</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Linked List</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition of linked list</li> <li>• Components of linked list</li> <li>• Representation of linked list</li> <li>• Advantages and Disadvantages of linked list</li> <li>• Types of linked list: Singly linked list, doubly linked list, Circular linked list</li> <li>• Operations on singly linked list: creation, insertion, deletion, search and display</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Tree, Graphs and their Applications</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition : Tree</li> <li>• Binary tree, Complete binary tree, Binary search tree</li> <li>• Heap</li> <li>• Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node</li> <li>• Binary tree: Array representation of tree, Creation of binary tree.</li> <li>• Traversal of Binary Tree: Preorder, Inorder and postorder.</li> <li>• Graphs</li> <li>• Application of Graphs</li> <li>• Depth First search, Breadth First search.</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr.No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1	Data Structures and Algorithm Analysis in C	Weiss	II Edition, Pearson Education, 2001
2	Schaum's outline series Data structures	Lipschutz	Tata McGraw-Hill
3	Data Structures and program designing using 'C'	Robert Kruse	Pearson Education
4	Programming in ANSI C.	E. Balaguruswamy	Tata McGraw-Hill
5	Data Structures Using C	Bandyopadhyay	Pearson Education, 1999
6	Data Structures Using C	Tenenbaum	Pearson Education, 200
7	Introduction to Data Structures in C	Kamthane	Pearson Education 2005
8	Practical approach to Data Structures	Hanumanthappa M	Practical approach to Data Structures
9	Aaron Data Structures using C and C++	Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron	Pearson Education

**COURSE OUTCOME:**

The course provides an overview of the Linux Operating System, geared toward new users as an exploration tour and getting started guide. This unit provides examples to help the learners get a better understanding of the Linux system. The unit also provides the guidelines for the learners to take up vendor certifications.

The unit explores the basics of Linux, the underlying management of the Linux operating system and its network configuration. The complete system services of Linux is explained along with the troubleshooting.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to Operating System	7
2.	Process Management – Processes and Threads	8
3.	Process Management – Synchronization and Deadlocks	8
4.	Storage Management	6
5.	Protection and Security	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Operating System</b>
	<ul style="list-style-type: none"> <li>Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.</li> <li>History of UNIX, Features &amp; Benefits, Versions of UNIX, Features of UNIX File System,, Commonly Used Commands and getting Started (Login/Logout) .</li> <li>Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces</li> </ul>
2.	<b>Process Management – Processes and Threads</b>
	<ul style="list-style-type: none"> <li>Processes: Process concept, Process scheduling, Co-operating processes, Inter process Communication</li> <li>Threads: Introduction to Threads, Single and Multi-threaded processes</li> <li>CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling,</li> <li><b>Unix Process Management</b> The Structure of Processes: Process States and Transitions - Layout of system memory - Context of a process.</li> <li>Process Control: Process Creation – Signals – Process Termination – Invoking other programs – PID &amp; PPID – Shell on a Shell.</li> </ul>
3.	<b>Process Management – Synchronization and Deadlocks</b>
	<ul style="list-style-type: none"> <li>Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions,</li> <li>Monitors, OS Synchronization, Atomic Transactions. Deadlocks: System Model,</li> </ul>

	<ul style="list-style-type: none"> <li>Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.</li> </ul>
<b>4.</b>	<b>Storage Management</b>
	<ul style="list-style-type: none"> <li>Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.</li> <li>Virtual Memory Management: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing,</li> <li>File-System Interface: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.</li> <li>File-System Implementation: File-System structure. Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery.</li> <li>Disk Management: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation</li> <li><b>The Unix File System</b></li> <li>Inodes - Structure of a regular file – Directories - Conversion of a path name to an inode - Super block - Inode assignment to a new file - Allocation of disk blocks.</li> <li>System calls for the file System: Open – Read - Write - Lseek – Close - File creation - Creation of special files - Changing directory and root - changing owner and mode – stat and fstat - pipes - Dup - Mounting and Un mounting file systems - Link and Un link.</li> </ul>
<b>5.</b>	<b>Protection and Security</b>
	<ul style="list-style-type: none"> <li>Protection: Goals of Protection, Domain of Protection, Security: Security Problem,</li> <li>User Authentication, One – Time Password, Program Threats, System Threats,</li> <li>UNIX SYSTEM ADMINISTRATION Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, managing user accounts-adding &amp; deleting users, changing permissions and ownerships,</li> <li>Creating and managing groups, modifying group attributes, temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security &amp; Permissions, becoming super user using su.</li> <li>Getting system information with uname, host name, disk partitions &amp; sizes, users, kernel, installing and removing packages with rpm command</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Book	Author	Publication
1.	Operating System Concepts and design	Milan Milonkovic,	II Edition, McGraw Hill 1992.
2.	Operation System Concepts	Tanenbaum	2 <sup>nd</sup> Edition, Pearson Education.
3.	Operating System	William Stallings	4 <sup>th</sup> Edition, Pearson Education.
4.	Guide to UNIX Using LINUX	Jack Dent Tony Gaddis, Vikas	Thomson Pub. House Pvt. Ltd. 2010

# Practical

**Code: BCM02205**

**COMPUTER NETWORKS LAB**

**2 Credits [LTP: 0-0-4]**

## **A. List of Programs**

<b>Part A</b>	
	1 Implementation of TCP/IP protocol – I
	2 Implementation of TCP/IP protocol - II
	3 Troubleshooting Scenarios Network - I
	4 Troubleshooting Scenarios Network - II
	5 Router – Configuration - I
	6 Router – Configuration - II
<b>Part B</b>	
	7 Router – Configuration - III
	8 Configuration of IP Address for a Router – I
	9 Configuration of IP Address for a Router - II
	10 Setting up of Passwords – I
	11 Setting up of Passwords – II
	12 Setting up of Passwords - III

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. A. Write a program to print “Hello World” in Java.  . B. Write a program to add two numbers  C. Write a program to demonstrate the different access specifiers</li> <li>2. A. Write a program to demonstrate inheritance, abstraction, encapsulation and Polymorphism.  B. Write a program to find the factorial of n numbers  C. Write a program to calculate Fibonacci series  D. Write a program to add n numbers and series</li> <li>3. A. Write a program to create an array and store elements into the array.  B. Write a program to find the sum of elements in an array  C. Write a program to demonstrate switch case, if, if-else and for loop.</li> <li>4. A. Write a program to demonstrate the working of methods.  B. Write a program which has four methods – add(), subtract(), multiply() and divide() and demonstrate a simple console calculator.  C. Write a program to accept command line arguments and display them to the user  Write a program which uses different packages</li> <li>5. A. Write a program to create a package.  B. Write a program to handle different exceptions</li> <li>6. A. Write a program to demonstrate try-catch, throw and throws.  B. Write a program to accept input from the user using streams</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Write a program to read a file</li> <li>8. Write a program to write into a file</li> <li>9. A. Write a program to demonstrate client server communication (socket programming)  B. Write a program to create threads and manipulate them</li> <li>10. Write a program to create a user interface to check user authentication.</li> <li>11. Write a program to create a registration form and save the details into a file</li> <li>12. Write a program to create a small animation using applets</li> </ol>

**A. List of Programs:**

Part A	
	<ol style="list-style-type: none"><li>1. Use a recursive function to find<ol style="list-style-type: none"><li>(a) GCD of two numbers.</li><li>(b) Use a recursive function to find the Fibonacci series.</li></ol></li><li>2. Use pointers to find the length of a string and to concatenate two strings.</li><li>3. Perform the following:<ol style="list-style-type: none"><li>(a) Use pointers to copy a string and to extract a substring from a given a string.</li><li>(b) Use a recursive function for the towers of Hanoi with three discs.</li></ol></li><li>4. Perform the following:<ol style="list-style-type: none"><li>(a) Insert an integer into a given position in an array.</li><li>(b) Deleting an integer from an array.</li></ol></li><li>5. Write a program to create a linked list and to display it.</li><li>6. Perform the following:<ol style="list-style-type: none"><li>(a) Write a program to sort N numbers using insertion sort.</li><li>(b) Write a program to sort N numbers using selection sort.</li></ol></li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Inserting a node into a singly linked list.</li><li>8. Deleting a node from a singly linked list.</li><li>9. Pointer implementation of stacks.</li><li>10. Pointer implementation of queues.</li><li>11. Creating a binary search tree and traversing it using in order, preorder and post order.</li><li>12. Sort N numbers using merge sort.</li></ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BCM02108**

**ENGLISH-II**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

After studying the building blocks of English like Grammar Essentials, Sentence structure and Professional writing skills, students will now learn about few advanced Grammar like Voice, Tenses, Communication concepts and so on. In the second Unit which is Advanced Grammar, they are taught concepts in Synonyms, Idioms and Phrases and Antonyms all of which give a little color to the language. Students will learn about report writing, review writing and more interesting topics in communication, which is the final topic.

## **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Comprehension	8
2.	Short Paragraph Writing	7
3.	Review writing	7
4.	Writing for Social Media	7
5.	Presentations & Miscellaneous	7

## **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Comprehension</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Comprehension passage 1</li><li>• Comprehension passage 2</li><li>• Comprehension passage 3</li><li>• Comprehension passage 4</li><li>• Comprehension passage 5</li></ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"><li>• Conclusion of Unit</li></ul>
2.	<b>Short Paragraph Writing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Topic 1</li><li>• Topic 2</li><li>• Topic 3</li><li>• Topic 4</li><li>• Topic 5</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences</li><li>• Conclusion of Unit</li></ul>
3.	<b>Review writing</b>



	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> </ul> <p>Topic 1 – Book [can be a story review for average students]  Topic 2 - Movie review [different kinds of movies can be suggested too for practice]  Topic 3 – Another Movie review  Topic 4 – Hotel / Café / Recreations centre Review  Topic 5 – Electronic Gadget Review (Laptop/smart phone / speakers/ PSP/ etc.)</p> <p>What is a review? How to write a review. Different types of reviews.</p> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Writing for Social Media</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Writing for social media: Facebook, Inked-in</li> <li>• Points to remember while writing on the social media. How to write Profile summary.</li> <li>• What is a blog? How to write a blog?</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Presentations &amp; Miscellaneous</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Formal Informal</li> <li>• Debate</li> <li>• Discussions</li> <li>• Pick &amp; Speak</li> </ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <p>Usage of Phrases &amp; Idioms</p> <p>Revision of English I &amp; II</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Practical English Usage	Michel Swan	Oxford University Press
2.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English		South Asian edition), Cambridge University Press
3.	Learn Correct English: Grammar, Usage and Composition	Shiv K. Kumar & Hemalatha Nagarajan	Pearson, New Delhi, India
4.	Grammar of the Modern English Language	Sukhdev Singh & Balbir Singh	Foundation Books, New Delhi
5.	Communicative English for Engineers and Professionals	Nitin Bhatnagar and Mamta Bhatnagar	Pearson( New Delhi)
6.	Communicative grammar and composition	Rajesh.K.Lidiya	Oxford Univ Press, New Delhi.

<b>Code: BCM02209</b>	<b>LIFE &amp; CAREER SKILLS-I</b>	<b>1 Credit [LTP: 0-0-2]</b>
-----------------------	-----------------------------------	------------------------------

• **LIST OF ACTIVITIES**

<b>Part - A</b>	
1.	Self-Introduction & knowing your environment
2.	GOAL Setting & Planning
3.	Time Management & Team Work
4.	Personal Grooming and Body language
5.	Etiquettes (Personal, Social, Professional & Corporate) etiquettes
6.	Reading skills: General & Technical Articles
<b>Part - B</b>	
7.	Listening Skills: Analysis of videos by famous Personalities
8.	Writing Skills: Picture perception & Story Making by jumbled words
9.	Speaking Skills: Extempore, JAM & Me against myself
10.	Role Plays
11.	Resume Writing
12.	Group Discussion

**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-II shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the SECOND Semester are as follows:

Code	Activity	Hours	Credits
BCM02610.1	Online Eligibility Exam (OLE)	1	0.5
BCM02610.2	Campus Recruitment Training (CRT) -Introduction to Public Speaking	3	
BCM02610.3	Online Certification Courses	-	

# POORNIMA UNIVERSITY, JAIPUR

## BCA (AI & PA) First Year

### Teaching Scheme for First Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BAP01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BAP01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BAP01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BAP01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BAP01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BAP01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BAP01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BAP01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BAP01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BAP01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BAP01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (AI & PA) First Year

### Teaching Scheme for Second Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BAP02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BAP02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BAP02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BAP02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BAP02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BAP02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BAP02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BAP02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BAP02610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

POORNIMA UNIVERSITY, JAIPUR										
BCA (AI & PA) Second Year										
Teaching Scheme for Third Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Theory			
BAP03101	Introduction to RPA Tools	4	-	-	40	60	100	4	Theory	Core Course
BAP03102	Database Management System	3	-	-	40	60	100	3	Theory	Core Course
BAP03103	Object Oriented Analysis & Design	3	-	-	40	60	100	3	Theory	Core Course
BAP03204	Introduction to RPA Tools Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP03205	Database Management System Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP03106.1	Elements of Discrete Mathematics	3	-	-	40	60	100	3	Theory	Departmental Elective
BAP03106.2	Elements of Probability and Statistics				40	60	100		Theory	Departmental Elective
BSE03151	Fundamentals of IoT and its Applications	3	-	-	40	60	100	3	Theory	Open Elective
BSE03152	Introduction to Animation and Photography				40	60	100		Theory	Open Elective
BSE03153	Python Programming				40	60	100		Theory	Open Elective
BSE03154	Blockchain Fundamentals				40	60	100		Theory	Open Elective
BSE03155	Big Data Analytics				40	60	100		Theory	Open Elective
BSE03156	Introduction to Digital Marketing				40	60	100		Theory	Open Elective
BAP03313	Summer Project	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BAP03414	Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BAP03215	Personality Development	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP03216	Life & Career Skills-II	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP03617	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP03617.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BAP03617.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BAP03617.3	Online Certification Courses	-	-	-	-	-	-			
	Total	18	0	17				24.5		
	Total Teaching Hours	35								

# POORNIMA UNIVERSITY, JAIPUR

## BCA (AI & PA) Second Year

### Teaching Scheme for Fourth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BAP04101	Six Sigma and Lean Methods	3	-	-	40	60	100	3	Theory	Core Course
BAP04102	Digital Electronics	3	1	-	40	60	100	4	Theory	Core Course
BAP04103	Analysis and Design of Algorithms	3	-	-	40	60	100	3	Theory	Core Course
BAP04204	Digital Electronics Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP04205	Analysis and Design of Algorithms Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP04106.1	Data Visualization	3	-	-	40	60	100	3	Theory	Departmental Elective
BAP04106.2	Business Intelligence				40	60	100		Theory	Departmental Elective
	Annexure 1	3	-	-	40	60	100	3	Theory	Open Elective
BAP04407	Industrial Training Seminar	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BAP04208	Logical Reasoning and Thinking	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP04209	Life & Career Skills-III	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP04610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP04610.1	Campus Recruitment Training/OLE	2	-	-	-	-	-			
BAP04610.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BAP04610.3	Online Certification Courses	-	-	-	-	-	-			
	Total	17	1	15				23.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.

# POORNIMA UNIVERSITY, JAIPUR

## BCA (AI & PA) Third Year

### Teaching Scheme for Fifth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BAP05101	Business Process Management	3	-	-	40	60	100	3	Theory	Core Course
BAP05102	Embedded Systems	3	-	-	40	60	100	3	Theory	Core Course
BAP05103	Digital Image Processing	4	-	-	40	60	100	4	Theory	Core Course
BAP05104	Natural Language Processing	3	-	-	40	60	100	3	Theory	Core Course
BAP05205	Embedded Systems Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP05206	Digital Image Processing Lab	-	-	5	60	40	100	2	Practical	Core Course
BAP05207	Natural Language Processing Lab	-	-	2	60	40	100	1	Practical	Core Course
BAP05108.1	Pattern Recognition	3	-	-	40	60	100	3	Theory	Departmental Elective
BAP05108.2	Artificial Neural Networks				40	60	100		Theory	Departmental Elective
BAP05209	Life & Career Skills-IV	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP05610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP05610.1	Campus Recruitment Training/OLE	3	-	-	-	-	-			
BAP05610.2	Non Syllabus Project (NSP)	-	-	1	-	-	-			
BAP05610.3	Online Certification Courses	-	-	-	-	-	-			
	Total	19	0	14				22.5		
	Total Teaching Hours	33								

**Professional Certificate Course (PCC)** shall be offered to all students equivalent to **2 hrs/wk**. This course is Non credit Certificate course and therefore is not a part of marksheet / gradesheet.



# POORNIMA UNIVERSITY, JAIPUR

## BCA (AI & PA) Third Year

### Teaching Scheme for Sixth Semester

Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BAP06301	Major Project / Internship	-	-	12	60	40	100	12	Practical	Skill Enhancement Course
BAP06602	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50		Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP06602.1	Campus Recruitment Training/OLE	-	-	-	-	-	-	-		
BAP06602.2	Non Syllabus Project (NSP)	-	-	-	-	-	-	-		
BAP06602.3	Online Certification Courses	-	-	-	-	-	-	-		
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>12</b>				<b>12</b>		
	<b>Total Teaching Hours</b>	<b>12</b>								

Summary Sheet for Teaching Scheme (Credits)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Total Credits
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	13	4	-	-	6	1	-	1	0.5	25.5
II	13	6	-	-	3	-	-	1	0.5	23.5
III	10	4	3	3	-	2	-	2	0.5	24.5
IV	10	4	3	3	-	1	-	2	0.5	23.5
V	13	5	3	-	-	-	-	1	0.5	22.5
VI	-	-	-	-	-	12	-	-	-	12
Total	59	23	9	6	9	16		7	2.5	131.5

Summary Sheet for Teaching Scheme (Subjects)										
Semester	A (CC)		B (DE)	C (OE)	D (AECC)		E (SEC)		F (SO&DEC)	Remarks
	Theory	Practical	Theory	Theory	Theory	Practical	Theory	Practical		
I	4	2	-	-	2	1	-	1	3	-
II	4	3	-	-	1	-	-	1	3	-
III	3	2	2	6	-	2	-	2	3	School Level Open Elective
IV	3	2	2	25	-	1	-	2	3	University Level Open Elective
V	4	3	2	-	-	-	-	1	3	-
VI	-	-	-	-	-	1	-	-	3	Internship for 6 months
Total	18	12	6	31	3	5	0	7	18	100

## Annexure - I

### Open Elective Courses at University Level in IV Semester (For All Schools)

Sr. No.	Course Code	Course Name	Teaching Department
1	BOE04111	Industrial Psychology and Sociology	Mechanical Engineering
2	BOE04112	Total Quality Management	Mechanical Engineering
3	BOE04113	Project Management	Mechanical Engineering
4	BOE04114	Logistics and Supply Chain Management	Mechanical Engineering
5	BOE04115	Basics of Petro Industry	Mechanical Engineering
6	BOE04116	Nano Science and Technology	Electrical & Electronics Engineering
7	BOE04117	Non Conventional Energy Sources	Electrical & Electronics Engineering
8	BOE04118	Introduction to Soft Computing	Electrical & Electronics Engineering
9	BOE04119	IPR and Patents	Electrical & Electronics Engineering
10	BOE04120	Artificial intelligence	Electrical & Electronics Engineering
11	BOE04121	E-commerce	Computer Engineering
12	BOE04122	Management Information System (MIS)	Computer Engineering
13	BOE04123	IT Act and Cyber Law	Computer Engineering
14	BOE04124	Python	Computer Engineering
15	BOE04125	Basics of UX/UI Design	Computer Engineering
16	BOE04126	Values and Professional Ethics	SMC
17	BOE04127	Digital Marketing	SMC
18	BOE04128	Business Research	SMC
19	BOE04129	Basics of Economics	SMC
20	BOE04130	Entrepreneurship	SMC
21	BOE04131	Essentials of Management	SMC
22	BOE04132	Organizational Behaviour & Cyber Law	SMC
23	BOE04133	Disaster Management	SPA
24	BOE04134	Foreign Language French & Japanese	SPA
25	BOE04135	Creative Thinking	SDA



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE & ENGINEERING

# BCA

AI & PA

Batch 2019-22

## BCA- AI & PA



July 2019

Teaching Scheme for  
BCA – AI & PA  
Detailed Syllabus for  
I & II SEM

POORNIMA UNIVERSITY, JAIPUR										
BCA (AI & PA) First Year (2019-2022)										
Teaching Scheme for First Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BAP01101	Programming Fundamentals using C	3	-	-	40	60	100	3	Theory	Core Course
BAP01102	Computer Organization and Architecture	3	-	-	40	60	100	3	Theory	Core Course
BAP01103	Web Designing	3	-	-	40	60	100	3	Theory	Core Course
BAP01104	Computer Oriented Numerical & Statistical Methods	3	1	-	40	60	100	4	Theory	Core Course
BAP01205	Programming Fundamentals using C Lab	-	-	5	60	40	100	2	Practical	Core Course
BAP01206	Web Designing Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP01107	English-I	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BAP01208	Language Lab	-	-	2	60	40	100	1	Practical	Ability Enhancement Compulsory Course
BAP01109	Environmental Studies	3	-	-	40	60	100	3	Theory	Ability Enhancement Compulsory Course
BAP01210	Office Automation Lab	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP01611	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP01611.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BAP01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	-	-	-	-	-			
BAP01611.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>20</b>	<b>1</b>	<b>14</b>				<b>25.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								

POORNIMA UNIVERSITY, JAIPUR										
BCA (AI & PA) First Year (2019-2022)										
Teaching Scheme for Second Semester										
Course Code	Course Name	Teaching Scheme (Hrs per wk)			Marks Distribution			Credits	Course Type	Course Category
		Lec (L)	Tut (T)	Prac (P)	IE	ESE	Total			
BAP02101	Computer Networks	3	-	-	40	60	100	3	Theory	Core Course
BAP02102	OOPs using Java	4	-	-	40	60	100	4	Theory	Core Course
BAP02103	Data Structures	3	-	-	40	60	100	3	Theory	Core Course
BAP02104	Operating System	3	-	-	40	60	100	3	Theory	Core Course
BAP02205	Computer Networks Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP02206	OOPs using Java Lab	-	-	5	60	40	100	2	Practical	Core Course
BAP02207	Data Structures Lab	-	-	4	60	40	100	2	Practical	Core Course
BAP02108	English-II	3	-	-	60	40	100	3	Theory	Ability Enhancement Compulsory Course
BAP02209	Life & Career Skills-I	-	-	2	60	40	100	1	Practical	Skill Enhancement Course
BAP02610	Discipline and Talent Enrichment Programme (TEP)	-	-	-	50	-	50	0.5	Practical	Social Outreach, Discipline & Extra Curricular Activities
BAP02610.1	Online Eligibility Exam (OLE)	-	-	1	-	-	-			
BAP02610.2	Campus Recruitment Training (CRT) - Introduction to Public Speaking	3	-	-	-	-	-			
BAP02610.3	Online Certification Courses	-	-	-	-	-	-			
	<b>Total</b>	<b>19</b>	<b>0</b>	<b>16</b>				<b>23.5</b>		
	<b>Total Teaching Hours</b>	<b>35</b>								



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**

**AI & PA**

**Batch 2019-22**

**BCA- AI & PA**



**Teaching Syllabus  
for  
I Sem.**



## CORE THEORY SUBJECTS

Code: BAP01101

PROGRAMMING FUNDAMENTALS USING C

3 Credits [LTP: 3-0-0]

### COURSE OUTCOME:

Even with the introduction of several high level languages and frameworks, the development of procedural codes is important in several commercial app developments. The object oriented platforms and event driven systems use procedural languages for coding integral command content.

C is an important procedural language and was developed initially to write the UNIX operating system. UNIX operating system, C compiler and all UNIX application programs are written in C. C is popular because, it is easy to learn, produces efficient programs, can handle low-level activities, and can be compiled on a variety of platforms.

This unit focuses on all the basic concepts, syntax and constructs of the C language. For students, who are new to programming, this unit can be considered as the starting point before taking up any other programming oriented units. The students will be implementing the concepts explained here to create simple to complex programs.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Overview of Programming	6
2.	Fundamentals of C programming	6
3.	Advanced programming techniques	8
4.	Dynamic data structures in C	8
5.	Additional features	8

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	Overview of Programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Introduction to computer based problem solving</b>, Program design and implementation issues- Flowcharts &amp; Algorithms, Top down design &amp; stepwise refinement</li><li><b>Programming environment</b> – Machine language, assembly language, high level languages, Assemblers, Compilers, Interpreters.</li><li>Conclusion of the Unit</li></ul>
2.	Fundamentals of C programming
	<ul style="list-style-type: none"><li>Introduction of Unit</li><li><b>Overview of C</b>, Data Types, Constants &amp; Variables, Operators &amp; Expressions</li><li><b>Control constructs</b>-if then, for, while, <b>Arrays</b>- single &amp; multidimensional arrays</li><li><b>Functions</b>-fundamentals – general form, function arguments, return value</li><li><b>Basic I/O</b>-formatted and Unformatted I/O, <b>Advanced features</b>- Type modifiers and storage class specifies for data types, Bit operators, Operator, &amp;operator, * operator, Type casting, type conversion.</li><li>Conclusion of the Unit</li></ul>
3.	Advanced programming techniques



	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Control constructs</b>- Do while, Switch statement, break and continue, exit() function, go to and label</li> <li>• <b>Scope rules</b>- Local &amp; global variables, scope rules of functions</li> <li>• <b>Functions</b>-parameter passing, call by value and call by reference, calling functions with arrays, argc and argv, recursion- basic concepts, ex-towers of Hanoi.</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Dynamic data structures in C</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Pointers</b>- The &amp; and * operator, pointer expression, assignments, arithmetic, comparison, malloc vs calloc, arrays of pointers, pointers to pointers, initializing pointers, pointers to functions, function returning pointers</li> <li>• <b>Structures</b>- Basics, declaring, referencing structure elements, array of structures, passing structures to functions, structure pointers, arrays and structures within structures</li> <li>• <b>Unions</b> – Declaration, uses, enumerated data-types, typedef.</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Additional features</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>File Handling</b> – The file pointer, file accessing functions, fopen, fclose, puc, getc, fprintf</li> <li>• <b>C Preprocessor</b>- #define, #include, #undef, Conditional compilation directives.</li> <li>• <b>C standard library and header files</b>: Header files, string functions, mathematical functions, Date and Time functions.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Let us C, 6 <sup>th</sup> Edition	Yashwant Kanetka	PBP Publication
2.	The C programming Language	Richie and Kenninghan	BPB Publication,2004
3.	Programming in ANSI C 3 <sup>rd</sup> Edition, 2005	Balaguruswamy	Tata McGraw Hill

## COURSE OUTCOME:

- To understand and the use of basic concepts of Computer components.
- To understand the concept of memory hierarchy and the use of various input-output devices.
- To understand the various computer languages, operating system functions and the application of number systems.
- To understand the basic Computer Networking principles and the applications of WWW, multimedia and the usage of electronic mail.

## A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	<b>Register Transfer and Micro-operation</b>	8
2.	<b>Basic Computer Organization</b>	8
3.	<b>Micro Programmed Control Unit</b>	8
4.	<b>Computer Arithmetic</b>	6
5.	<b>Modes of Data Transfer and Memory Organization</b>	6

## B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Register Transfer and Micro-operation</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer.</li> <li>• Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor,</li> <li>• Logic Micro-operations: List of Logic micro operations, Shift Micro-operations (excluding H/W implementation), Arithmetic Logic Shift Unit.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Basic Computer Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Instruction Codes, Computer Registers: Common bus system, Computer Instructions:</li> <li>• Instruction formats, Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle, Register reference instructions.</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Micro Programmed Control Unit</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Control Memory, Address Sequencing, Conditional branching, Mapping of instruction, Subroutines.</li> <li>• Design of Control Unit, Central Processing Unit: Introduction, General Register Organization,</li> <li>• Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes.</li> <li>• Conclusion of Unit</li> </ul>
4.	<b>Computer Arithmetic</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Addition and Subtraction,</li> <li>• Multiplication Algorithms (Booth algorithm), Division Algorithms,</li> </ul>

	<ul style="list-style-type: none"> <li>• Input – Output Organization: Peripheral devices, Input – Output interface, Introduction of Multiprocessors: Characteristics of multi-processors.</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Modes of Data Transfer and Memory Organization</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Modes of Data Transfer: Priority Interrupt, Direct Memory Access,</li> <li>• Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory,</li> <li>• Associative Memory, Cache Memory, Virtual Memory</li> <li>• Conclusion of unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

<b>Sr. No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1.	Computer System Architecture	Morris Mano	PHI
2.	Computer Organization and Architecture	William Stallings	PHI
3.	Digital Computer Electronics:	An Introduction to Microcomputers by Malvino	TMH

**COURSE OUTCOME:**

Web Technology has revolutionized mankind and entirely changed the way we look at things. Banking, Education, Retailing, Manufacturing and Research are some of the things that have undergone major transformations due to influence from web development. By adding more features, increasing the scope and reach of industries, making it available to users irrespective of their geography, web has captivated the human minds. Learning web technology is one of the top priorities for every computer enthusiast in order to better understand its working and scope. Students will understand the fundamental working technology behind web development and HTML. They will be taught concepts like JS, HTML5 thus making them capable of web development.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to the Internet and the World Wide Web	8
2.	HTML & CSS	8
3.	XML and HTML5, CSS3	8
4.	PHP Server side scripting	6
5.	Practical website development	6

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to the Internet and the World Wide Web</b>
	<ul style="list-style-type: none"> <li>Introduction, History of internet, Internet Design Principles, Internet Protocols - FTP, TCP/IP, SMTP, Telnet, etc., Client Server Communication, Web System architecture</li> <li>Evolution of the Web, Web architectures, Web clients and servers, Static and Dynamic Web Applications, Front end and back end web development.</li> <li>HTML, CSS, JS, XML; HTTP, secure HTTP, etc; URL, Web Services – SOAP, REST</li> </ul>
2.	<b>HTML &amp; CSS</b>
	<ul style="list-style-type: none"> <li>Introduction to Html, Html Document structure, Html Editors, Html element/tag &amp; attributes, Designing simple page - Html tag, Head tag, Body tag;</li> <li>More Html tags - Anchor tag, Image tag, Table tag, List tag, Frame tag, Div tag ; Html forms - Input type, Text area, Select , Button, Images.</li> <li>Introduction to CSS, Syntax, Selectors ,Embedding CSS to Html, Formatting fonts, Text &amp; background colour, Inline styles, External and Internal Style Sheets, Borders &amp; boxing</li> </ul>
3.	<b>XML and HTML5, CSS3</b>
	<ul style="list-style-type: none"> <li>Introduction to XML, Difference b/w Html &amp; XML, XML editors, XML Elements &amp; Attributes XML DTD, XML Schema, XML Parser, Document Object Model (DOM), XML DOM.</li> <li>Introduction to HTML5, CSS3, New features, Local storage, Web Sockets, Server events, Canvas, Audio &amp; Video, Geolocation, Microdata, Drag and Drop. Browser life cycle and browser rendering stages. Service workers</li> </ul>
4.	<b>PHP Server side scripting</b>
	<ul style="list-style-type: none"> <li>Introduction to PHP, Basic Syntax, Variables, constants and operators, Loops, Arrays Strings,</li> <li>Environment &amp; environment variables, responding to HTTP requests, Files, Cookies, Sessions, Examples.</li> </ul>
5	<b>Practical website development</b>

	<ul style="list-style-type: none"> <li>• Commonly used Web Servers and browsers, Setting up a server and domain name, website types and structures,</li> <li>• Web authoring tools, Web hosting, website maintenance, generating traffic to your website.</li> </ul>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Book	Author	Publication
<b>a. Reference Books</b>			
1.	Practical Web Design for Absolute Beginners	Adrian W. West	Apress 2016
2.	Introducing Web Development	Jorg Krause	Apress 2017
3.	HTML & CSS: The Complete Reference	Thomas Powell	McGraw Hill, Fifth Edition, 2010
4.	Creating a Website: The Missing Manual	Mathew Macdonald. O'Reilly	3rd Edition

**COURSE OUTCOME:**

- To learn fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skewness and kurtosis.
- To solve problems on theory of probability, linear programming problems, transportation, assignment and game problems.
- To learn important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications..

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Basic Statistics	8
2.	Probability Distribution	10
3.	Regression	10
4.	Sample introduction, Sampling	10
5.	T-Test	10

**B. DETAILED SYLLABUS**

Unit	Unit Details Regression
1.	<b>Basic Statistics</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Preparing Frequency Distribution Table and Cumulative frequency, Measure of Central Tendency, Types: Arithmetic mean, Geometric Mean, Harmonic Mean, Median, Mode.</li> <li>• Measure of Dispersion: Range, Quartile Deviation, mean deviation, Coefficient of mean Deviation, Standard Deviation</li> <li>• Moments: Moments About mean, Moments about any point, Moment about origin, Moment about mean in terms of moment about any point, Moment about any point in terms of Moment about mean.</li> <li>• Conclusion of Unit</li> </ul>
2.	<b>Probability Distribution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Random Variable- Discrete Random and Continuous Random variable, Probability Distribution of a Random Variable, Mathematical Expectation</li> <li>• Types: Binomial, Poisson, Normal Distribution, Mean and Variance of Binomial, Poisson, and Normal Distribution.</li> <li>• Correlation: Introduction, Types, Properties, Methods of Correlation: Karl Pearson's Coefficient of Correlation, Rank Correlation and Concurrent Deviation method, Probable error</li> <li>• Conclusion of Unit</li> </ul>
3.	<b>Regression</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Introduction, Aim of Regression Analysis, Types of Regression Analysis, Lines of Regression, Properties of Regression Coefficient and Regression Lines, Comparison with Correlation.</li> </ul>

	<ul style="list-style-type: none"> <li>• Curve Fitting: Straight Line, Parabolic curve, Geometric Curve and Exponential Curve Baye's Theorem in Decision Making, Forecasting Techniques</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Sample introduction, Sampling</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Meaning, methods of Sampling, Statistical Inference: Test of Hypothesis, Types of hypothesis, Procedure of hypothesis Testing, Type I and Type II error,</li> <li>• One Tailed and two tailed Test, Types of test of Significance: Test of significance for Attribute-Test of No. of success and test of proportion of success</li> <li>• Test of significance for large samples - Test of significance for single mean and Difference of mean, Test of significance for small samples</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>T-Test</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Test the significance between the mean of a random sample, between the mean of two independent samples.</li> <li>• Chi square Test, ANOVA: Meaning, Assumptions, One way classification, ANOVA Table for One-Way Classified Data</li> <li>• Conclusion of unit</li> </ul>

#### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Fundamentals of Applied statistics	Gupta S.P. and Kapoor	Sultan Chand & Sons, 1996.
2.	Introduction to Statistics	Graybill,	McGraw

# Practicals

Code: BAP01205

PROGRAMMING FUNDAMENTALS USING C LAB

2 Credits [LTP: 0-0-5]

## A. List of Programs

Part A	
	<ol style="list-style-type: none"><li>1. Find biggest number among 4 given numbers</li><li>2. Printing the reverse of an integer.</li><li>3. Printing the odd and even series of N numbers.</li><li>4. Input a string and find the number of each of the vowels appear in the string.</li><li>5. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li><li>6. Printing the reverse of a string.</li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Searching an element in an array using pointers.</li><li>8. Checking whether the given matrix is an identity matrix or not</li><li>9. Addition and subtraction of two matrices.</li><li>10. Multiplication of two matrices.</li><li>11. Print the following:</li><li>12. Reverse of an integer.</li><li>13. Odd and even series of N numbers.</li><li>14. Get a string and convert the lowercase to uppercase and vice--versa using getchar() and putchar().</li><li>15. Perform the following:</li><li>16. Input a string and find the number of each of the vowels appear in the string</li><li>17. Accept N words and make it as a sentence by inserting blank spaces and a full stop at the end.</li></ol>



**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. 1. Hello World Web Page               <ol style="list-style-type: none"> <li>a) Create a web page using basic HTML features like tags, attributes, elements and page title.</li> <li>b) How to install, and configure a web server</li> </ol> </li> <li>2. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) A more functional web page by making use of headings, paragraphs, lists, images and links.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Use different font styles.</li> <li>ii. Set background image for both the page and single elements on the page.</li> </ol> </li> </ol> </li> <li>3. Create a My Profile Page               <ol style="list-style-type: none"> <li>a) Using textboxes, check boxes, radio buttons and submit buttons.</li> <li>b) Design a web page using CSS include the following:                   <ol style="list-style-type: none"> <li>i. Control the repetition of image with background-repeat property.</li> <li>ii. Define style for links as a: link, b: active, c: hover, d: visited.</li> <li>iii. Add customized cursors for links.</li> </ol> </li> </ol> </li> <li>4. Create XMLHttpRequest and retrieve data from a text file and an XML file.</li> <li>5. Create the following webpage:               <ol style="list-style-type: none"> <li>a) Show the class timetable in a tabular format.</li> <li>b) Create a webpage using HTML to show your geolocation.</li> </ol> </li> <li>6. Create a webpage using HTML for audio and video player.</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Create a login registration form using PHP.</li> <li>8. Develop a PHP webpage to manipulating files such as creating, writing, reading and uploading.</li> <li>9. Create a dynamic webpage by using PHP conditional operators, loops and strings to create an dynamic timetable page.</li> <li>10. Develop a PHP web application track the user as how many times visited and last visited time</li> <li>11. Develop a static website – I.</li> <li>12. Develop a dynamic website –II</li> </ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BAP01107**

**ENGLISH-I**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

### **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Everyday Conversations	8
2.	Asking for..	7
3.	Reporting/ Describing	7
4.	Meeting People	7
5.	Expressing & Talking about....	7

### **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Everyday Conversations</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Introducing self / others</li><li>• Weather</li><li>• Classroom</li><li>• Asking about facilities around</li><li>• Describing a person / thing</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
2.	<b>Asking for..</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Help/ Suggestion/ ideas</li><li>• Clarification/ Directions</li><li>• Time/ food</li><li>• Advice</li><li>• Uses</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li><li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li><li>• Conclusion of Unit</li></ul>
3.	<b>Reporting/ Describing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Incidences</li><li>• Personalities</li><li>• Experiences</li><li>• Wants/Needs</li><li>• Intentions</li></ul>

	<ul style="list-style-type: none"> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Meeting People</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Greetings</li> <li>• Starting the Conversation</li> <li>• Small talks</li> <li>• Closing the conversation</li> <li>• Points to cover: Vocabulary, Grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheet</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Expressing &amp; Talking about....</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Happiness/Displeasure</li> <li>• Preferences</li> <li>• Doubts</li> <li>• Views</li> <li>• Unawareness</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Interests</li> <li>• Different Cultures, Clothes, cars, institutes, situations</li> <li>• Schedules, prices</li> <li>• Points to cover: Vocabulary, grammar, Construction of sentences, listening</li> <li>• Methodology: Role plays, Videos, Classroom conversation, worksheets</li> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Speak Now Level I & II	Jack C Richards & David Bohlke	Oxford Press
2.	Business Benchmark, Level –	Guy Brook-Hart	Upper Intermediate by Cambridge University Press
3.	Practical English Usage	Michel Swan	Oxford University Press
4.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English	Ronald Carter, Michael McCarthy	(South Asian edition), Cambridge University Press

**COURSE OUTCOME:**

To train students to be comfortable with everyday communication. Training the students in English grammar.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Communication Process	6
2.	Types of Communication & Barriers to communication	5
3.	Listening Skills & Reading Skills	5
4.	Conversation Skills	4
5.	Telephone Etiquette	4

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Communication Process</b>
	<ul style="list-style-type: none"> <li>What is communication?</li> <li>The communication model</li> <li>Elements of communication</li> <li>Importance of effective communication skills in the business world</li> <li>Components of Communication</li> <li>Process, practicing effective communication, good communication Vs effective communication, styles of communication, intercultural communication skills- need for attitude change and benefits</li> </ul>
2.	<b>Types of Communication &amp; Barriers to communication</b>
	<ul style="list-style-type: none"> <li>Verbal Communication</li> <li>Non Verbal Communication</li> <li>Written Communication</li> <li>Do's and don'ts of each type</li> <li>Barriers to effective communication and how to overcome them</li> <li>Interaction of verbal and non-verbal communication, talents of a corporate communicator, silence- merits and limitations of each type</li> </ul>
3.	<b>Listening Skills &amp; Reading Skills</b>
	<ul style="list-style-type: none"> <li>What is listening</li> <li>Various types of listening – Active, passive, selective, listening and note taking, listening and comprehending, listening to speak,</li> <li>Principles of good listening</li> <li>Techniques to develop effective listening skills</li> <li>Reading Skills- skimming, scanning and inferring- common reading techniques,</li> <li>Practicing smart reading.</li> </ul>
4.	<b>Conversation Skills</b>
	<ul style="list-style-type: none"> <li>Importance of conversation skills</li> <li>Features of a good conversation</li> <li>Tips to improve Conversation skills</li> </ul>

	<ul style="list-style-type: none"> <li>• Importance of questioning skills, techniques to ask right questions- role play situations to practice the same, discussing issues (social, political and cultural), formal and informal conversation</li> </ul>
<b>5.</b>	<b>Telephone Etiquette</b>
	<ul style="list-style-type: none"> <li>• Basic rules of telephone etiquette- formal vs. informal; tone, pitch and vocabulary related to formal ways of speaking over the phone, leaving voice messages; practice sessions (role plays)</li> <li>• <b>Persuasive communication</b> :What is persuasive communication, different techniques of persuasive communication, How to negotiate using persuasive communication, the act of negotiation, negotiation style and their contexts, fundamentals of negotiation, common hurdles in negotiation and how to overcome them</li> </ul>

**COURSE OUTCOME:**

The student would be able:

- To acquire the knowledge of environmental studies and understand the principles of ecology and environmental issues.
- To distinguish & analyze different water treatment methods and conservation of water.
- To design innovative ideas for controlling air, noise & soil pollution.
- To develop deeper knowledge in the problems and possibilities of waste management from a national and global perspective and demonstrate socio-economic skills for sustainable development.
- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Environmental studies	6
2.	Ecology	8
3.	Natural & Biological Resources	8
4.	Social Issues	7
5.	Environmental Pollution	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1	<b>Environmental studies</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Scope</li> <li>• Importance &amp; components</li> <li>• Natural and Manmade.</li> <li>• Conclusion of the Unit</li> </ul>
2	<b>Ecology</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Concept</li> <li>• Structure and Functions of Ecosystem</li> <li>• Biotic and A biotic Factors</li> <li>• Environmental Interactions.</li> <li>• Defining Communication Theories.</li> <li>• Conclusion of the Unit</li> </ul>
3	<b>Natural &amp; Biological Resources</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Plants</li> <li>• Animal and Microorganisms.</li> <li>• Conclusion of the Unit</li> </ul>
4	<b>Social Issues</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Human Population</li> <li>• Environment</li> </ul>

	<ul style="list-style-type: none"> <li>• Conclusion of the Unit</li> </ul>
<b>5</b>	<b>Environmental Pollution</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition</li> <li>• Cause</li> <li>• Effects</li> <li>• Types and Control Measures</li> <li>• Conservation and preservation of Environment.</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr.No	Reference Book	Author	Edition	Publication
1.	Environmental Studies	Erach Barucha	Latest	UGC
2.	Environmental Studies	Benny Joseph	Latest	Tata McgrawHill
3.	Environmental Studies	R. Rajagopalan	Latest	Oxford University Press
4.	Principles of Environmental Science and Engineering	P. Venugoplan Rao	Latest	Prentice Hall of India.
5.	Environmental Science and Engineering	Meenakshi	Latest	Prentice Hall India.
<b>Important Web Links</b>				
1.	<a href="http://www.ct.gov/">http://www.ct.gov/</a>			
2.	<a href="http://www.energy.gov">http://www.energy.gov</a>			

## Skill Enhancement Courses (SEC)

**Code: BAP01210**

**OFFICE AUTOMATION LAB**

**1 Credit [LTP: 0-0-2]**

### A. List of Programs

1	Installing Operating Systems and Basic Software
	<b>MS Word</b>
	<ol style="list-style-type: none"> <li>1. Prepare a document about any tourist destination of your choice with appropriate pictures and editing features.</li> <li>2. Prepare a News Paper Layout. Insert appropriate pictures wherever necessary. Use the following Features: <ul style="list-style-type: none"> <li>• Three Column and Four Column setting</li> <li>• Set One or Two Advertisements</li> <li>• Use Bullets and Numbering.</li> </ul> </li> <li>3. Create a Document consisting of Bio-data. It includes <ul style="list-style-type: none"> <li>• A table giving your qualification and/or experience of work. Table should be Bordered and Shaded.</li> <li>• A Multilevel list giving your areas of interest and further areas of interest. The sub areas should be numbered as</li> <li>• 'a', 'b', etc while the areas should be numbered as '1', '2', etc.</li> <li>• The information should be divided in “General” and “Academic” sections.</li> <li>• The header should contain “BIO-DATA” while the footer should have page numbers in the format Page 1 of 10.</li> <li>• Assign a password for the document to protect it from unauthorized access.</li> </ul> </li> <li>4. Assume that you are coordinating a seminar in your organization. Write a letter to 10 different IT companies asking them to participate in the seminar using mail merge facility.</li> <li>5. Prepare a document which contains template of marks card of students. Assume that there are 10 students. The footer for the document should be 'Poornima University Jaipur'.</li> <li>6. Prepare a document about any topic In mathematics which uses mathematical symbols. (At least 5 mathematical symbols should be used). Assign a password for the document to protect it from unauthorized access. Demonstrate the use of Hyperlink Option. Sets margins to your document, a font of size and double spaced document</li> </ol>
	<b>MS – Excel</b>
	<ol style="list-style-type: none"> <li>7. Open a new workbook, save it as JavaCoffeeBar.xls. In sheet1 write following sales data for Java Coffee bar to show their first 6 months sales.</li> </ol>



	<ul style="list-style-type: none"> <li>• Select cell B4:D4 and change the horizontal alignment to center and text to 90 degree.</li> <li>• All titles should be in bold</li> <li>• Format all cells numbers to currency style and adjust width as necessary.</li> <li>• Add border to data.</li> <li>• Select the cell range A1:H1, merge and center these cells. Apply same format to A2:H2.</li> <li>• Give border, shading and pattern to data in sheet</li> <li>• Apply different font settings for all titles in sheet</li> <li>• Apply green color and bold setting to sales above 10000 (use conditional formatting)</li> <li>• Rename current worksheet as FirstHalfSales</li> </ul> <p>8. Prepare a worksheet to maintain student information. The work sheet should Contain Roll Number, Name and marks in 5 subjects. (Max Marks is 100). Validate the marks. Calculate the total marks. Assign the grade according to the following. Assign grade 'A' if the total marks is above 450. From 401 to 449 assign the grade as 'B'. From 351 to 400 assign the Grade as 'C'. From 300 to 350 the grade to be assigned is 'D'. For the total marks less than 300 No grade is assigned. A student is eligible to get a grade only when he gets 40 and above in all the subjects. In such cases the grade is “FAIL”. (Assume that there are 10 students)</p> <p>9. Prepare a pay-bill using a worksheet. The work sheet should contain Employee Id, Name, Designation, Experience and Basic Salary and Job ID. If Job Id is 1 then DA is 40% of the basic salary. HRA is Rs. 4500. If Job Id is 2 then DA is 35% of the basic salary. HRA is Rs. 3500. If Job Id is 3 then DA is 30% of the basic salary. HRA is Rs. 2500. If Job Id is 4 then DA is 25% of the basic salary and HRA is RS.2500. For all the other Job ids DA is 20% of the basic salary and HRA is Rs. 1500. For all the above Job ids PF to be deducted is 4%. For the job ids between 1-4 Rs. 100 to be deducted as Professional Tax. Find the net pay.</p> <p>10. For the above employee worksheet perform the following operations</p> <ul style="list-style-type: none"> <li>• Use filter to display the details of employees whose salary is greater than 10,000.</li> <li>• Sort the employees on the basis of their net pay</li> <li>• Use advance filter to display the details of employees whose designation is "Programmer" and Net Pay is greater than 20,000 with experience greater than 2 yrs</li> </ul> <p>11. Using Excel project the Product sales for any five products for five years.</p> <ul style="list-style-type: none"> <li>• Compute the total sales of each product in the five years.</li> <li>• Compute the total sales of all the products in five year.</li> <li>• Compute the total sales of all products for each year.</li> <li>• Represent annual sale of all the products using Pie-Chart.</li> <li>• Represent annual sales of all products using Bar Chart.</li> <li>• Represent sale of a product for five years using Pie-Chart.</li> <li>• Label and format the graphs</li> </ul> <p>12. Create a statement of Telephone Bill Charge for a customer.</p> <ul style="list-style-type: none"> <li>• Telephone Calls</li> <li>• Up to 150 calls- free</li> <li>• 151 to 500 calls- 0.80 per call</li> <li>• 501 to 1000 calls- 1.00 per call</li> <li>• 1001 to 2000 - 1.25 per call</li> <li>• Above 2000- 1.40 per call</li> </ul> <p>13. Perform Following:</p> <ul style="list-style-type: none"> <li>• Using Excel write sales data with columns product, month and sales. Write at least 5 records. Create Pivot Table chart and Report for the data.</li> </ul>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<ul style="list-style-type: none"> <li>• Create a macro to change the name of worksheet as Macro Example, merge first three columns of first row and write heading as DATA in green color with yellow background</li> <li>• Link word document in excel worksheet to show the usage of linking and embedding.</li> </ul>
	<b>MS - PowerPoint</b>
	<p>14. Assume that you are going to give a presentation about Information Technology. (Choose some latest technologies). The presentation should have minimum 10 slides. Insert appropriate images wherever necessary. Use proper formatting, Diagrams and tables. Show the usage of action buttons, hyperlinks, and animations.</p>

**Code: BAP01611 DISCIPLINE AND TALENT ENRICHMENT PROGRAMME (TEP) – I 2 CREDITS****COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-I shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the FIRST Semester are as follows:

Code	Activity	Hours	Credits
BAP01611.1	Online Eligibility Exam (OLE)	1	0.5
BAP01611.2	Campus Recruitment Training (CRT) - Introduction to Communication Skills	2	
BAP01611.3	Online Certification Courses	-	



**POORNIMA**  
UNIVERSITY

SCHOOL OF COMPUTER SCIENCE &  
ENGINEERING

**BCA**

**AI & PA**

**Batch 2019-22**

**BCA- AI & PA**



**Teaching Syllabus  
for  
II Sem.**

## CORE THEORY SUBJECTS

Code: BAP02101

COMPUTER NETWORKS

3 Credits [LTP: 3-0-0]

### COURSE OUTCOME:

It is important for networking professionals to have a sound grounding in the basics of networking and with the networking technology being developed thick and fast, the professionals need to be updated of them at all times. The focus of this unit is providing a background to the basics of networking and its underlying principles.

This course will explore the fundamentals of networking, the principle and purpose behind layered models, devices used in networks and their wireless connectivity and the ways to troubleshoot network related issues. The unit underpins the principles of networking and enables the learners to work towards taking up vendor certifications in the networking domain. To enable students to understand computer networking concepts, how they work, how they operate and the protocols, standards and the models associated with networking technology and their troubleshooting mechanisms.

### A. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Networking Fundamentals	8
2.	Basics of Network Devices	7
3.	Basics of Network, Transport and Application Layers	7
4.	WAN Technology	7
5.	Network Operating Systems and Troubleshooting Network	7

### B. DETAILED SYLLABUS

Unit	Unit Details
1.	<b>Networking Fundamentals</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Basics of Network &amp; Networking, Advantages of Networking, Types of Networks</li><li>• Network Terms- Host, Workstations, Server, Client, Node</li><li>• Types of Network Architecture- Peer-to-Peer &amp; Client/Server, Workgroup Vs. Domain</li><li>• Network Topologies, Types of Topologies, Logical and physical topologies, selecting the Right Topology</li><li>• Types of Transmission Media, Communication Modes, Wiring Standards and Cabling- straight through cable, crossover cable, rollover cable, media connectors (Fibre optic, Coaxial, and TP etc.)</li><li>• Introduction of OSI model, Seven layers of OSI model, Functions of the seven layers, Introduction of TCP/IP Model, TCP, UDP, IP, ICMP, ARP/RARP, Comparison between OSI model &amp; TCP/IP model</li><li>• Overview of Ethernet Addresses</li><li>• Conclusion of the Unit</li></ul>
2.	<b>Basics of Network Devices</b>
	<ul style="list-style-type: none"><li>• Introduction To Unit</li><li>• Network Devices- NIC- functions of NIC, installing NIC, Hub, Switch, Bridge, Router, Gateways, And Other Networking Devices, Repeater, CSU/DSU, and modem</li><li>• Data Link Layer: Ethernet, Ethernet standards, Ethernet Components, Point-to-Point Protocol (PPP ),PPP standards, Address Resolution Protocol, Message format, transactions</li></ul>

	<ul style="list-style-type: none"> <li>• Wireless Networking: Wireless Technology, Benefits of Wireless Technology</li> <li>• Types of Wireless Networks: Ad-hoc mode, Infrastructure mode</li> <li>• Wireless network Components: Wireless Access Points, Wireless NICs</li> <li>• wireless LAN standards: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, wireless LAN modulation techniques</li> <li>• wireless security Protocols: WEP,WPA, 802.1X, Installing a wireless LAN</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Basics of Network, Transport and Application Layers</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Layer: Internet Protocol (IP ), IP standards, versions, functions, IPv4 addressing, IPv4 address Classes, IPv4 address types, Subnet Mask, Default Gateway, Public &amp; Private IP Address, methods of assigning IP address, IPv6 address, types, assignment, Data encapsulation, The IPv4 Datagram Format, The IPv6 Datagram Format, Internet Control Message Protocol (ICMP ), ICMPv4, ICMPv6, Internet Group Management Protocol (IGMP ),Introduction to Routing and Switching concepts</li> <li>• Transport Layer: Transmission Control Protocol(TCP), User Datagram Protocol (UDP), Overview of Ports &amp; Sockets</li> <li>• Application Layer: DHCP, DNS, HTTP/HTTPS, FTP, TFTP, SFTP, Telnet, Email: SMTP, POP3/IMAP, NTP</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>WAN Technology</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• What Is a WAN?, WAN Switching, WAN Switching techniques Circuit Switching, Packet Switching etc., Connecting to the Internet : PSTN, ISDN, DSL, CATV, Satellite-Based Services, Last Mile Fiber, Cellular Technologies</li> <li>• Connecting LANs : Leased Lines, SONET/SDH, Packet Switching, Remote Access: Dial-up Remote Access, Virtual Private Networking, SSL VPN, Remote Terminal Emulation, Network security: Authentication and Authorization, Tunneling and Encryption Protocols, IPSec, SSL and TLS, Firewall, Other Security Appliances, Security Threats</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Network Operating Systems and Troubleshooting Network</b>
	<ul style="list-style-type: none"> <li>• Introduction To Unit</li> <li>• Network Operating Systems: Microsoft Operating Systems, Novell NetWare, UNIX and Linux Operating Systems, Macintosh Networking</li> <li>• Trouble Shooting Networks: Command-Line interface Tools, Network and Internet Troubleshooting, Basic Network</li> <li>• Troubleshooting : Troubleshooting Model, identify the affected area, probable cause, implement a solution, test the result, recognize the potential effects of the solution, document the solution</li> <li>• Using Network Utilities: ping, traceroute, tracert, ipconfig, arp, nslookup, netstat, nbtstat, Hardware trouble shooting tools, system monitoring tools</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr. No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1.	CCNA Cisco Certified Network Associate: Study Guide (With CD)	Todd Lamele	7th Edition (Paperback), Wiley India, 2011
2.	CCENT/CCNA ICND1 640-822 Official Cert Guide	Wendell Odom	3 Edition (Paperback), Pearson, 2013
3.	Routing Protocols and Concepts CCNA Exploration Companion Guide (With CD)	Rick Graziani, Allan Johnson	Pearson, 2008
4	CCNA Exploration Course Booklet : Routing Protocols and Concepts	Cisco Networking Academy	Pearson, 2010

**COURSE OUTCOME:**

Object oriented programming is the most proven technique for developing reliable programs. It helps in increased productivity, reusability of code, decreases development time, and reduces cost of production to an extent. The cost of maintaining such systems have also considerably decreased. There are many languages which used the object oriented concepts and techniques. Some of them are C++, Java, Smalltalk, Objective-C, etc.

Java is a purely object oriented language. Systems/applications created using java programming language reduces the need for developing and maintain complex and space consuming applications. Java has a lot of advantages of being simple, robust, platform independent, etc. Nowadays java is also found in the mobile phones. This unit focuses on the concepts of object oriented programming language and the different constructs for creating applications in java.

To provide students with an understanding of the object oriented concepts which helps in the field of programming, management of data, etc. and of Java programming which helps to explore the object oriented nature of the language and the multi-platform versatility offered by it.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Object Oriented Programming	8
2	Basic Java Programming	10
3	Java Packages and Interfaces	10
3	Exceptions and I/O Handling	10
5	User Interface and Advanced Concepts	10

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Object Oriented Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Classes and Objects</li> <li>• Object Oriented Programming Concepts</li> <li>• Access Specifiers and Access Modifiers</li> <li>• Introduction to Java, Java Virtual Machine</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Basic Java Programming</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Variables</li> <li>• Data Types</li> <li>• Control flow statements – if, else, switch, for, while</li> <li>• Arrays</li> </ul>



	<ul style="list-style-type: none"> <li>• Strings</li> <li>• Conclusion of the Unit</li> </ul>
<b>3.</b>	<b>Java Packages and Interfaces</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Java classes, Java methods, Packages, Interfaces</li> <li>• Java.util, java.io, java.net, java.sql, java.applet, etc</li> <li>• Collection Framework</li> <li>• Generics</li> <li>• Wrapper classes</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Exceptions and I/O Handling</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• Errors and Exceptions</li> <li>• Exception handling</li> <li>• Streams, Readers and Writers</li> <li>• Programming with Files</li> <li>• Multithreaded programming</li> <li>• Networking – Socket Programming</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>User Interface and Advanced Concepts</b>
	<ul style="list-style-type: none"> <li>• Introduction to Unit</li> <li>• User Interface Components</li> <li>• AWT</li> <li>• Swing</li> <li>• Event Handling</li> <li>• Layouts, Forms</li> <li>• Applets</li> <li>• Annotations</li> <li>• Conclusion of the Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1	Java Complete Reference	Herbert Schildt	TMH
2	SAMS teach yourself Java-2	Rogers Cedenhead and Leura Lemay	3rd Edition, Pub. Pearson Education.

**COURSE OUTCOME:**

A data structure is a particular way of storing and organizing data in a computer so that it can be used efficiently. Different kinds of data structures are suited to different kinds of applications and some are highly specialized to specific tasks. In this course the student will be learning about different data structures and their applications.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1	Introduction to Data structures	7
2	Searching and Sorting	7
3	Stack and Queue	8
4	Linked List	7
5	Tree Graphs and their Applications	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Data structures</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition,</li> <li>• Classification of data structures: primitive and non-primitive</li> <li>• Elementary data organization</li> <li>• Time and space complexity of an algorithm (Examples), String processing.</li> <li>• Definition of dynamic memory allocation</li> <li>• Accessing the address of a variable</li> <li>• Declaring and initializing pointers -</li> <li>• Accessing a variable through its pointer, Meaning of static and dynamic memory allocation, Memory allocation functions: malloc(), calloc(), free() and realloc().</li> <li>• Recursion – Definition, advantages, Writing Recursive programs – Binomial coefficient, Fibonacci, GCD.</li> <li>• Conclusion of the Unit</li> </ul>
2.	<b>Searching and Sorting</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• <b>Basic Search Techniques</b> - Sequential search, Iterative and Recursive methods, Binary search: Iterative and Recursive methods, Comparison between sequential and binary search.</li> <li>• <b>Sorting:</b> General background and definition - Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort</li> <li>• Conclusion of the Unit</li> </ul>

<b>3.</b>	<b>Stack, and Queue</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Stack – Definition</li> <li>• Array representation of stack</li> <li>• Operations on stack: Infix, prefix and postfix notations</li> <li>• Conversion of an arithmetic expression from Infix to postfix</li> <li>• Applications of stacks.</li> <li>• Definition of queue</li> <li>• Array representation of queue</li> <li>• Types of queue: Simple queue, Circular queue, Double ended queue (deque), Priority queue,</li> <li>• Operations on all types of Queues</li> <li>• Conclusion of the Unit</li> </ul>
<b>4.</b>	<b>Linked List</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition of linked list</li> <li>• Components of linked list</li> <li>• Representation of linked list</li> <li>• Advantages and Disadvantages of linked list</li> <li>• Types of linked list: Singly linked list, doubly linked list, Circular linked list</li> <li>• Operations on singly linked list: creation, insertion, deletion, search and display</li> <li>• Conclusion of the Unit</li> </ul>
<b>5.</b>	<b>Tree, Graphs and their Applications</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Definition : Tree</li> <li>• Binary tree, Complete binary tree, Binary search tree</li> <li>• Heap</li> <li>• Tree terminology: Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node</li> <li>• Binary tree: Array representation of tree, Creation of binary tree.</li> <li>• Traversal of Binary Tree: Preorder, Inorder and postorder.</li> <li>• Graphs</li> <li>• Application of Graphs</li> <li>• Depth First search, Breadth First search.</li> <li>• Conclusion of the Unit</li> </ul>

**C. RECOMMENDED STUDY MATERIAL:**

<b>Sr.No</b>	<b>Reference Book</b>	<b>Author</b>	<b>Publication</b>
1	Data Structures and Algorithm Analysis in C	Weiss	II Edition, Pearson Education, 2001
2	Schaum's outline series Data structures	Lipschutz	Tata McGraw-Hill
3	Data Structures and program designing using 'C'	Robert Kruse	Pearson Education
4	Programming in ANSI C.	E. Balaguruswamy	Tata McGraw-Hill
5	Data Structures Using C	Bandyopadhyay	Pearson Education, 1999
6	Data Structures Using C	Tenenbaum	Pearson Education, 200
7	Introduction to Data Structures in C	Kamthane	Pearson Education 2005
8	Practical approach to Data Structures	Hanumanthappa M	Practical approach to Data Structures
9	Aaron Data Structures using C and C++	Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron	Pearson Education

**COURSE OUTCOME:**

The course provides an overview of the Linux Operating System, geared toward new users as an exploration tour and getting started guide. This unit provides examples to help the learners get a better understanding of the Linux system. The unit also provides the guidelines for the learners to take up vendor certifications.

The unit explores the basics of Linux, the underlying management of the Linux operating system and its network configuration. The complete system services of Linux is explained along with the troubleshooting.

**A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to Operating System	7
2.	Process Management – Processes and Threads	8
3.	Process Management – Synchronization and Deadlocks	8
4.	Storage Management	6
5.	Protection and Security	7

**B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Introduction to Operating System</b>
	<ul style="list-style-type: none"> <li>Objectives and Functions of OS, Evolution of OS, OS Structures, OS Components, OS Services, System calls, System programs, Virtual Machines.</li> <li>History of UNIX, Features &amp; Benefits, Versions of UNIX, Features of UNIX File System,, Commonly Used Commands and getting Started (Login/Logout) .</li> <li>Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces</li> </ul>
2.	<b>Process Management – Processes and Threads</b>
	<ul style="list-style-type: none"> <li>Processes: Process concept, Process scheduling, Co-operating processes, Inter process Communication</li> <li>Threads: Introduction to Threads, Single and Multi-threaded processes</li> <li>CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-time Scheduling,</li> <li><b>Unix Process Management</b> The Structure of Processes: Process States and Transitions - Layout of system memory - Context of a process.</li> <li>Process Control: Process Creation – Signals – Process Termination – Invoking other programs – PID &amp; PPID – Shell on a Shell.</li> </ul>
3.	<b>Process Management – Synchronization and Deadlocks</b>
	<ul style="list-style-type: none"> <li>Process Synchronization: Mutual Exclusion, Critical – section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical Regions,</li> <li>Monitors, OS Synchronization, Atomic Transactions. Deadlocks: System Model,</li> </ul>

	<ul style="list-style-type: none"> <li>Deadlock characterization, Methods for handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.</li> </ul>
<b>4.</b>	<b>Storage Management</b>
	<ul style="list-style-type: none"> <li>Memory Management: Logical and physical Address Space, Swapping, Contiguous Memory Allocation, Paging, Segmentation with Paging.</li> <li>Virtual Memory Management: Demand paging, Process creation, Page Replacement Algorithms, Allocation of Frames, Thrashing,</li> <li>File-System Interface: File concept, Access Methods, Directory structure, File- system Mounting, File sharing, Protection and consistency semantics.</li> <li>File-System Implementation: File-System structure. Directory Implementation, Allocation Methods, Free-space Management, Efficiency and Performance, Recovery.</li> <li>Disk Management: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Attachment, stable-storage Implementation</li> <li><b>The Unix File System</b></li> <li>Inodes - Structure of a regular file – Directories - Conversion of a path name to an inode - Super block - Inode assignment to a new file - Allocation of disk blocks.</li> <li>System calls for the file System: Open – Read - Write - Lseek – Close - File creation - Creation of special files - Changing directory and root - changing owner and mode – stat and fstat - pipes - Dup - Mounting and Un mounting file systems - Link and Un link.</li> </ul>
<b>5.</b>	<b>Protection and Security</b>
	<ul style="list-style-type: none"> <li>Protection: Goals of Protection, Domain of Protection, Security: Security Problem,</li> <li>User Authentication, One – Time Password, Program Threats, System Threats,</li> <li>UNIX SYSTEM ADMINISTRATION Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, managing user accounts-adding &amp; deleting users, changing permissions and ownerships,</li> <li>Creating and managing groups, modifying group attributes, temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security &amp; Permissions, becoming super user using su.</li> <li>Getting system information with uname, host name, disk partitions &amp; sizes, users, kernel, installing and removing packages with rpm command</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Book	Author	Publication
1.	Operating System Concepts and design	Milan Milonkovic,	II Edition, McGraw Hill 1992.
2.	Operation System Concepts	Tanenbaum	2 <sup>nd</sup> Edition, Pearson Education.
3.	Operating System	William Stallings	4 <sup>th</sup> Edition, Pearson Education.
4.	Guide to UNIX Using LINUX	Jack Dent Tony Gaddis, Vikas	Thomson Pub. House Pvt. Ltd. 2010

# Practical

Code: BAP02205

COMPUTER NETWORKS LAB

2 Credits [LTP: 0-0-4]

## A. List of Programs

Part A	
	1 Implementation of TCP/IP protocol – I
	2 Implementation of TCP/IP protocol - II
	3 Troubleshooting Scenarios Network - I
	4 Troubleshooting Scenarios Network - II
	5 Router – Configuration - I
	6 Router – Configuration - II
Part B	
	7 Router – Configuration - III
	8 Configuration of IP Address for a Router – I
	9 Configuration of IP Address for a Router - II
	10 Setting up of Passwords – I
	11 Setting up of Passwords – II
	12 Setting up of Passwords - III

**A. List of Programs**

Part A	
	<ol style="list-style-type: none"> <li>1. A. Write a program to print “Hello World” in Java.  . B. Write a program to add two numbers  C. Write a program to demonstrate the different access specifiers</li> <li>2. A. Write a program to demonstrate inheritance, abstraction, encapsulation and Polymorphism.  B. Write a program to find the factorial of n numbers  C. Write a program to calculate Fibonacci series  D. Write a program to add n numbers and series</li> <li>3. A. Write a program to create an array and store elements into the array.  B. Write a program to find the sum of elements in an array  C. Write a program to demonstrate switch case, if, if-else and for loop.</li> <li>4. A. Write a program to demonstrate the working of methods.  B. Write a program which has four methods – add(), subtract(), multiply() and divide() and demonstrate a simple console calculator.  C. Write a program to accept command line arguments and display them to the user  Write a program which uses different packages</li> <li>5. A. Write a program to create a package.  B. Write a program to handle different exceptions</li> <li>6. A. Write a program to demonstrate try-catch, throw and throws.  B. Write a program to accept input from the user using streams</li> </ol>
Part B	
	<ol style="list-style-type: none"> <li>7. Write a program to read a file</li> <li>8. Write a program to write into a file</li> <li>9. A. Write a program to demonstrate client server communication (socket programming)  B. Write a program to create threads and manipulate them</li> <li>10. Write a program to create a user interface to check user authentication.</li> <li>11. Write a program to create a registration form and save the details into a file</li> <li>12. Write a program to create a small animation using applets</li> </ol>



**A. List of Programs:**

Part A	
	<ol style="list-style-type: none"><li>1. Use a recursive function to find<ol style="list-style-type: none"><li>(a) GCD of two numbers.</li><li>(b) Use a recursive function to find the Fibonacci series.</li></ol></li><li>2. Use pointers to find the length of a string and to concatenate two strings.</li><li>3. Perform the following:<ol style="list-style-type: none"><li>(a) Use pointers to copy a string and to extract a substring from a given a string.</li><li>(b) Use a recursive function for the towers of Hanoi with three discs.</li></ol></li><li>4. Perform the following:<ol style="list-style-type: none"><li>(a) Insert an integer into a given position in an array.</li><li>(b) Deleting an integer from an array.</li></ol></li><li>5. Write a program to create a linked list and to display it.</li><li>6. Perform the following:<ol style="list-style-type: none"><li>(a) Write a program to sort N numbers using insertion sort.</li><li>(b) Write a program to sort N numbers using selection sort.</li></ol></li></ol>
Part B	
	<ol style="list-style-type: none"><li>7. Inserting a node into a singly linked list.</li><li>8. Deleting a node from a singly linked list.</li><li>9. Pointer implementation of stacks.</li><li>10. Pointer implementation of queues.</li><li>11. Creating a binary search tree and traversing it using in order, preorder and post order.</li><li>12. Sort N numbers using merge sort.</li></ol>

# **Ability Enhancement Compulsory Course (AECC)**

**Code: BAP02108**

**ENGLISH-II**

**3 Credits [LTP: 3-0-0]**

## **COURSE OUTCOME:**

After studying the building blocks of English like Grammar Essentials, Sentence structure and Professional writing skills, students will now learn about few advanced Grammar like Voice, Tenses, Communication concepts and so on. In the second Unit which is Advanced Grammar, they are taught concepts in Synonyms, Idioms and Phrases and Antonyms all of which give a little color to the language. Students will learn about report writing, review writing and more interesting topics in communication, which is the final topic.

## **A. OUTLINE OF THE COURSE**

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Comprehension	8
2.	Short Paragraph Writing	7
3.	Review writing	7
4.	Writing for Social Media	7
5.	Presentations & Miscellaneous	7

## **B. DETAILED SYLLABUS**

Unit	Unit Details
1.	<b>Comprehension</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Comprehension passage 1</li><li>• Comprehension passage 2</li><li>• Comprehension passage 3</li><li>• Comprehension passage 4</li><li>• Comprehension passage 5</li></ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"><li>• Conclusion of Unit</li></ul>
2.	<b>Short Paragraph Writing</b>
	<ul style="list-style-type: none"><li>• Introduction of Unit</li><li>• Topic 1</li><li>• Topic 2</li><li>• Topic 3</li><li>• Topic 4</li><li>• Topic 5</li><li>• Points to cover: Vocabulary, grammar, Construction of sentences</li><li>• Conclusion of Unit</li></ul>
3.	<b>Review writing</b>

	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> </ul> <p>Topic 1 – Book [can be a story review for average students]  Topic 2 - Movie review [different kinds of movies can be suggested too for practice]  Topic 3 – Another Movie review  Topic 4 – Hotel / Café / Recreations centre Review  Topic 5 – Electronic Gadget Review (Laptop/smart phone / speakers/ PSP/ etc.)</p> <p>What is a review? How to write a review. Different types of reviews.</p> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>
<b>4.</b>	<b>Writing for Social Media</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Writing for social media: Facebook, Inked-in</li> <li>• Points to remember while writing on the social media. How to write Profile summary.</li> <li>• What is a blog? How to write a blog?</li> <li>• Conclusion of Unit</li> </ul>
<b>5.</b>	<b>Presentations &amp; Miscellaneous</b>
	<ul style="list-style-type: none"> <li>• Introduction of Unit</li> <li>• Formal Informal</li> <li>• Debate</li> <li>• Discussions</li> <li>• Pick &amp; Speak</li> </ul> <p>Points to cover: Vocabulary, grammar, Construction of sentences.</p> <p>Usage of Phrases &amp; Idioms</p> <p>Revision of English I &amp; II</p> <ul style="list-style-type: none"> <li>• Conclusion of Unit</li> </ul>

### C. RECOMMENDED STUDY MATERIAL:

Sr. No	Reference Book	Author	Publication
1.	Practical English Usage	Michel Swan	Oxford University Press
2.	Cambridge Grammar for English: A comprehensive Guide for spoken & written English		South Asian edition), Cambridge University Press
3.	Learn Correct English: Grammar, Usage and Composition	Shiv K. Kumar & Hemalatha Nagarajan	Pearson, New Delhi, India
4.	Grammar of the Modern English Language	Sukhdev Singh & Balbir Singh	Foundation Books, New Delhi
5.	Communicative English for Engineers and Professionals	Nitin Bhatnagar and Mamta Bhatnagar	Pearson( New Delhi)
6.	Communicative grammar and composition	Rajesh.K.Lidiya	Oxford Univ Press, New Delhi.

<b>Code: BCD02209</b>	<b>LIFE &amp; CAREER SKILLS-I</b>	<b>1 Credit [LTP: 0-0-2]</b>
-----------------------	-----------------------------------	------------------------------

• **LIST OF ACTIVITIES**

<b>Part - A</b>	
1.	Self-Introduction & knowing your environment
2.	GOAL Setting & Planning
3.	Time Management & Team Work
4.	Personal Grooming and Body language
5.	Etiquettes (Personal, Social, Professional & Corporate) etiquettes
6.	Reading skills: General & Technical Articles
<b>Part - B</b>	
7.	Listening Skills: Analysis of videos by famous Personalities
8.	Writing Skills: Picture perception & Story Making by jumbled words
9.	Speaking Skills: Extempore, JAM & Me against myself
10.	Role Plays
11.	Resume Writing
12.	Group Discussion

**COURSE OUTCOME:**

The objective of Discipline and TEP is to provide students with the opportunities to enhance job fetching skills and at the same time to cultivate the student's personal interests and hobbies while maintaining the good disciplinary environment in the University. TEP is integrated into the curriculum for holistic development of students through active participation in various activities falling in Technical and non-technical categories.

Discipline and Talent Enrichment Programme (TEP)-II shall be evaluated on the basis of its sub constituent programmes, as a complete Two credit course. It shall be counted in calculation of SGPA but it is not a backlog subject. However, the attendance of these classes shall be recorded and accounted in the total attendance.

Activities included in this category in the SECOND Semester are as follows:

Code	Activity	Hours	Credits
BAP02610.1	Online Eligibility Exam (OLE)	1	0.5
BAP02610.2	Campus Recruitment Training (CRT) -Introduction to Public Speaking	3	
BAP02610.3	Online Certification Courses	-	