

(2020 - 21 onwards)

BACHELOR OF COMPUTER APPLICATIONS (BCA)

COURSE STRUCTURE AND SYLLABUS

(For the candidates admitted from the academic year 2020-2021 onwards)

CHOICE BASED CREDIT SYSTEM (CBCS)



**DEPARTMENT OF COMPUTER APPLICATIONS
THANTHAI HANS ROEVER COLLEGE
(AUTONOMOUS)
(Nationally Re-Accredited by NAAC with B⁺⁺)
(Affiliated to Bharathidasan University, Tiruchirappalli)
ELAMBALUR, PERAMBALUR – 621 220**



VISION

To blossom as an institution of excellence, enabling, empowering and enlightening the youth and shaping them as fully developed human beings with the capacity to unfold their full mental potentiality resulting in the attainment of the wisdom to live constructively and meaningfully.

MISSION

- To provide congenial and stress- free environment and opportunities for the enhancement of knowledge and acquisition skills through the best exposure and training possible.
- To offer multifaceted and need-based academic programmes and to promote extension activities.
- To adopt technology-enabled new methods, approaches and techniques so that the teaching-learning process becomes learner-centered and learner-friendly.
- To maximize the participation of all the stakeholders in the development of the institution and the region.
- To sensitize the youth towards inclusive growth for socio-economic change, sustainable development, gender equality, eco-friendliness, etc.
- To enable the youth to experience the effects of globalization and facilitate them to grow as responsible citizens and leaders.
- To inspire them, through value-based education, to embrace the entire humanity while firmly rooted in the Indian ethos.
- To provide regular placement training and placement opportunities.
- To kindle the spirit of creativity and enhance research activities and enable them to attain international standards.

PROGRAMME OUTCOMES (PO's)

UNDERGRADUATE PROGRAMMES

Upon completion of the programme, the undergraduate will be able to

1. Acquire knowledge, understand concepts and apply new ideas which enable them to be employable or self employed
2. Demonstrate motivation in advancing to higher learning programmes
3. Engage in socially responsible behaviour and have value added education
4. Have exposure to technical proficiency, analytical capability, soft skills and life skills development
5. Develop broad understanding in the basic concepts of Languages/ Commerce/Management Studies/Physical Sciences/Computing Sciences/Biological Sciences/Life Sciences

PROGRAMME SPECIFIC OUTCOMES (PSO's)

1. Possess the fundamental knowledge of programming languages and other core computing concepts.
2. Ability to analyze problems and choose right software tools to solve it.
3. To design, develop, test and implement software systems.
4. To apply mathematical and accounting methods in software solutions.
5. Possess employability and entrepreneurship skills.



THANTHAI HANS ROEVER COLLEGE
(AUTONOMOUS)
PERAMBALUR - 621220



BACHELOR OF COMPUTER APPLICATIONS (BCA)

COURSE STRUCTURE UNDER - CBCS

(For the candidates admitted from the academic year 2020-21 onwards)

Sem	Part	Course Code	Title of the Course	Ins. Hours / Week	Credit	Ex am Hrs	CIA (Max)	ESE (Max)	Total (Max)
I	I	20UT1	Tamil - II (Idaikkala Ilakkiyam - Bakthi, Puthinam, Ilakkiya Varalaru) Tamil */Other Languages** #	6	3	3	25	75	100
	II	20UE1	English-I (Communicative English - I)	6	3	3	25	75	100
	III	20UCA1CC1	Programming in C	5	5	3	25	75	100
		20UMA1AC1	Numerical Methods and Statistics	5	3	3	25	75	100
		20UCA1CP1	Programming in C Lab	4	2	3	40	60	100
		20UCA1PE1	Professional English for Physical Sciences-I	2	2	3	25	75	100
	IV	20UVE	Value Education	2	2	3	25	75	100
Total				30	20	-	-	-	700
II	I	20UT2	Tamil - II (Idaikkala Ilakkiyam - Bakthi, Puthinam, Ilakkiya Varalaru) Tamil */Other Languages** #	6	3	3	25	75	100
	II	20UE2	English-II (Communicative English - II)	6	3	3	25	75	100
	III	20UCA2CC2	Programming in C++	5	5	3	25	75	100
		20UMA2AC2	Operations Research	5	3	3	25	75	100
		20UCA2CP2	Programming in C++ Lab	4	2	3	40	60	100
		20UCA2PE2	Professional English for Physical Sciences-II	2	2	3	25	75	100
	IV	20UES	Environmental Studies	2	2	3	25	75	100
Total				30	20	-	-	-	700
III	I	20UT3	Tamil-III (Kappiya Ilakkiyam, Nadagam, Ilakkiya Varalaru) Tamil */Other Languages**#	6	3	3	25	75	100
	II	20UE3	English-III (Language Through Literature and Communicative Skills – I)	6	3	3	25	75	100
	III	20UCA3CC3	Object Oriented Programming using Java	6	5	3	25	75	100
		20UMS3AC3:1	Financial Accounting	4	4	3	25	75	100
		20UCA3CP3	Object Oriented Programming using Java Lab	3	2	3	40	60	100
		20UMS3AP1	Accounting Package Lab	3	2	3	40	60	100
	IV	20UCA3NME1	NME-I*	2	2	3	25	75	100
Total				30	21	-	-	-	700

IV	I	20UT4	Tamil-IV (Pazhanthamizh Ilakkiyam, Ilakkiya Varalaru & Pothukkatturai) Tamil */Other Languages** #	6	3	3	25	75	100
	II	20UE4	English-IV (Language Through Literature and Communicative Skills – II)	6	3	3	25	75	100
	III	20UCA4CC4	Python Programming	5	4	3	25	75	100
		20UMS4AC4:1	Principles of Management	4	4	3	25	75	100
		20UCA4CP4	Python Programming Lab	3	2	3	40	60	100
		20UMS4AP2	Inventory Management Lab	2	2	3	40	60	100
	IV	20UCA4NME2	NME-II*	2	2	3	25	75	100
		20UCA4SBE1	Hardware Troubleshooting	2	2	3	25	75	100
			Total	30	22	-	-	-	800
V	III	20UCA5CC5	Computer Networks	5	5	3	25	75	100
		20UCA5CC6	Data Structures and Algorithms	5	5	3	25	75	100
		20UCA5CC7	Relational Database Management Systems	5	5	3	25	75	100
		20UCA5CP5	PHP and MYSQL Lab	4	3	3	40	60	100
		20UCA5MBE1:1/ 20UCA5MBE1:2/ 20UCA5MBE1:3	PHP Scripting Languages / Computer Graphics / Dot Net	5	5	3	25	75	100
	IV	20UCA5SBE2	Ruby on Rails	2	2	3	25	75	100
		20UCA5SBE3	Web Services	2	2	3	25	75	100
		20USSD	Soft Skill Development	2	2	3	25	75	100
				Total	30	29	-	-	-
VI	III	20UCA6CC8	Operating Systems	6	5	3	25	75	100
		20UCA6CC9	Smart Device Programming	6	5	3	25	75	100
		20UCA6CP6	Smart Device Programming Lab	5	4	3	40	60	100
		20UCA6MBE2:1/ 20UCA6MBE2:2/ 20UCA6MBE2:3	Software Engineering / Mobile Communication / XML Programming	6	6	3	25	75	100
		20UCA6MBE3:1/ 20UCA6MBE3:2/ 20UCA6MBE3:3	Mini Project (Students do it in our College) / Linux Lab/ Dot Net Lab	6	6	3	40	60	100
	V	20UGS	Gender Studies	1	1	3	25	75	100
			Extension Activities	-	1	-	-	-	-
			Total	30	28	-	-	-	600
Grand Total				180	140	-	-	-	4300

***List of Non Major Elective (For 2020 – 2021)**

Elective	Semester	Course Code	Title of the Course
NME-I	III	20UCA3NME1	Fundamentals of Computers
NME-II	IV	20UCA4NME2	Internet and its Applications

List of Skill Based Elective (For 2020 – 2021)

Elective	Semester	Course Code	Title of the Course
SBE-I	IV	20UCA4SBE1	Hardware Troubleshooting
SBE-II	V	20UCA5SBE2	Ruby on Rails
SBE-III	V	20UCA5SBE3	Web Services

List of Major Based Elective (For 2020 – 2021)

Elective	Semester	Course Code	Title of the Course
Elective-I	V	20UCA5MBE1:1	PHP Scripting Languages
	V	20UCA5MBE1:2	Computer Graphics
	V	20UCA5MBE1:3	Dot Net
Elective-II	VI	20UCA6MBE2:1	Software Engineering
	VI	20UCA6MBE2:2	Mobile Communication
	VI	20UCA6MBE2:3	XML Programming
Elective-III	VI	20UCA6MBE3:1	Mini Project
	VI	20UCA6MBE3:2	Linux Lab
	VI	20UCA6MBE3:3	Dot Net Lab

List of Allied Courses

Allied Course I

Mathematics

Allied Course II

Accountancy and Principles of Management

Language Part – I - **4**
English Part –II - **4**

Core Paper - **9**
Core Practical - **6**
Allied Paper - **4**

Allied Practical - **2**
Non-Major Elective - **2**
Skill Based Elective - **3**
Major Based Elective - **3**
Professional English - **2**
Environmental Studies - **1**
Value Education - **1**
Soft Skill Development - **1**
Gender Studies - **1**
Extension Activities - - **1 (Credit only)**

- * For those who studied Tamil up to +2 (Regular Stream)
- +Syllabus for Language Courses should be on par with Tamil
- # those who studied Tamil up to 10th +2 but opt for other languages in degree level under Part I should study special Tamil in Part IV
- ** Extension Activities shall be outside instruction hours

Non Major Elective I & II – for those who studied Tamil under Part I

- a) Basic Tamil I & II for other language students
- b) Special Tamil I & II for those who studied Tamil upto 10th or +2 but opt for other languages in degree programme

Note:

	CIA	External Marks
1. Theory	25	75
2. Practical	40	60
3. Separate passing minimum is prescribed for Internal and External marks		

FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for Semester Examinations shall be 40% out of 75 marks [i.e. 30 marks]

FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks]

The passing minimum for Semester Examinations shall be 40% out of 60 marks [i.e. 24 marks]

Separate passing minimum is prescribed for CIA and External marks

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for Theory Examinations shall be 40% out of 75 marks [i.e., 30 marks]

SEMESTER - I

(For the candidates admitted from the academic year 2020-2021 onwards)

SEMESTER-I

Course Code : 20UCA1CC1
Instruction Hours: 5
Credits : 5

Exam Hours : 03
Internal Marks : 25
External Marks : 75

CORE COURSE - I PROGRAMMING IN C

Course Outcomes

- Students will be able to develop, edit, compile, debug, correct, recompile and run applications.
- Choose appropriate data types, variables and statements for solving simple problems.
- Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
- Students will be able to define union and enumeration user defined data types.
- Construct programs using arrays and pointers for a given scenario.

UNIT I

Evolution and Basic Structure of C Programs — Constants - Variables – Data Types - Operators and Expressions – Type Conversions – Built-in Functions.

UNIT II

Data Input and Output - Decision Making and Branching Statements – Decision Making and Looping Statements.

UNIT III

Functions: Defining and Accessing Arguments – recursive functions – storage classes. Arrays: Defining and processing Arrays – Multidimensional arrays – passing arrays to functions – Arrays and Strings – String Functions – String Manipulations.

UNIT IV

Structures: Defining Structure – Declaring Structure Variable - Accessing Structure Members - Structure Initialization - Arrays of Structure - Arrays within Structures - Structures within Structures. Union - Pointers – Pointer Declarations – Operations on Pointers – Pointers with Functions – Pointers with Array, Strings – Array of Pointers – Pointers with structures.

UNIT V

Files: Defining, Opening and Closing a file -I/O Operations on Files –Error Handling I/O operations - Dynamic memory allocation and Linked list: Dynamic Memory Allocation – Linked lists-Advantages of linked list- type of linked list- concepts of linked list-Creating a linked list-inserting an item—deleting an item.

Text Book

E. Balagurusamy, Programming in ANSI C, Tata McGraw Hill Publishing Company, 8th Edition, 2019

Reference Books

1. Yeshavanth P. Kanetkar, Let us C, BPB Publications, 13th Edition, 2013.
2. The Complete Reference C Herbert Schildt, 4th Edition, 2017
3. Practical C Programming, 3rd Edition, Steve Qualline O'Reilly Media, 2011.

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HOD

Semester	Code	Title of the Course				Hours	Credits				
I	20UCA1CC1	PROGRAMMING IN C				5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓			
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓		✓	✓	✓	✓	✓		✓	
CO5		✓		✓	✓	✓	✓	✓		✓	
Number of Matches (✓) = 40, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER-I

Course Code : 20UMA1AC1

Exam Hours : 03

Instruction Hours : 5

Internal Marks : 25

Credits : 3

External Marks : 75

ALLIED COURSE - I NUMERICAL METHODS AND STATISTICS

Course Outcomes

- Evaluate algebraic and transcendental equations using numerical methods.
- Evaluate finite integrals using Trapezoidal and Simpson's rule and Solve differential equation and integration.
- Categorize and evaluate various measures of central tendency.
- Calculate correlation and regression.

UNIT - I

The Solution of Numerical Algebraic and Transcendental Equations: Bisection Method - Iteration Method - Regula Falsi Method - Newton Raphson Method – Simple Problems only.

UNIT - II

Solutions of Simultaneous Linear Algebraic Equations: Gauss Elimination Method– Gauss Jordan Method - Gauss Jacobi - Gauss Seidel Method.

UNIT - III

Numerical solution of ODE: Taylor Series Method - Euler's Method - Runge– Kutta Second and Fourth order method.

Numerical Integration: Trapezoidal Rule - Simpson's Rule (Proof not needed).

UNIT - IV

Measures of Central Tendency: Arithmetic Mean – Median – Mode – Geometric Mean – Harmonic Mean.

Measures of Dispersion: Range – Quartile Deviation - Standard Deviation.

UNIT - V

Correlation and Regression: Introduction – Scatter Diagram - Karl Pearson Co-efficient of Correlation – Rank Correlation- Lines of Regression- Simple Problems only.

Text Books

1. S.S.Sastry, "Introductory Methods of Numerical Analysis", PHI Learning Pvt.Ltd, New Delhi 2010.
2. Gupta.S.C & Kapoor, V.K, "Fundamentals of Mathematical Statistics", Sultan Chand & sons, New Delhi 1994.

Unit – I	Chapter – 2	Sections 2.2, to 2.5 [1]
Unit – II	Chapters - 6 & 8	Sections 6.3.2 to 6.3.3 & 8.3.1 to 8.3.2 [1]
Unit – III	Chapters - 7 & 5	Sections 7.2, 7.4, 7.5 & 5.4.1 to 5.4.3 [1]
Unit – IV	Chapters - 2 & 3	Sections 2.3 to 2.5.2, 2.6 to 2.9.1 & 3.3 – 3.5, 3.7 [2]
Unit – V	Chapter – 10	Sections 10.1 to 10.3, 10.3.1, 10.6, 10.7 and 10.7.1 [2]

Reference Books

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain, "Numerical Methods for Scientific and Engineering Computation", New Age International Private Limited, 1999.
2. C.E. Froberg, "Introduction to Numerical Analysis", II Edn., Addison Wesley, 1979.
3. P. Kandasamy, K.Thilagavathy, Calculus of Finite Differences and Numerical Analysis (Allied Mathematics), S.Chand & Co.Ltd, New Delhi.

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SEMESTER-I

Course Code : 20UCA1CP1
Instruction Hours: 4
Credits : 2

Exam Hours : 03
Internal Marks : 40
External Marks : 60

CORE PRACTICAL - I PROGRAMMING IN C LAB

Course Outcomes

After Completion of this course the student would be able to

- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Write programs that perform operations using derived data types.
- Calculation is performed by using advanced concepts in c programming.

List of Experiments

1. Write a C program
 - a. To find the Area of Rectangle, Square and Triangle.
 - b. To swap the values of two numbers without using third variable
2. Write a C program
 - a. To Find the Biggest of Three Numbers using a Ternary Operator.
 - b. To Find the Biggest of Three Numbers using if-else statements
3. Write a C program
 - a. To find the Factorial of a Given Number using for loop.
 - b. To find the Fibonacci series using recursive functions
4. Write a C program
 - a. To sort and display all the roll numbers of your class using Arrays.
 - b. To display the following patterns using Array
A
A B
A B C
.....
5. Write a C Program to manipulate the matrix addition, subtraction, multiplication using Switch case.
6. Write a C program to calculate simple interest using functions
7. Write a C program using pointers to compute the sum of all elements stored in the array.
8. Write a C program to prepare a student mark list using the file.

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Semester	Code	Title of the Course					Hours	Credits				
I	20UCA1CP1	PROGRAMMING IN C LAB					4	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓		✓	✓	✓	✓	✓		✓		
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓	✓	✓	✓			✓	✓	✓			
CO4	✓	✓		✓	✓		✓	✓				
CO5		✓		✓	✓	✓	✓	✓		✓		
Number of Matches (✓) = 38, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER-I

Course Code : 20UCA1PE1
Instruction Hours : 2
Credits : 2

Exam Hours : 03
Internal Marks : 25
External Marks : 75

PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES

Course Outcomes

- Recognize their own ability to improve their own competence in using the language
- Use language for speaking with confidence in an intelligible and acceptable manner
- Understand the importance of reading for life
- Read independently unfamiliar texts with comprehension
- Understand the importance of writing in academic life
- Write simple sentences without committing error of spelling or grammar
(Outcomes based on guidelines in UGC LOCF – Generic Elective)

UNIT 1: COMMUNICATION

1. Listening: Listening to instructions
2. Speaking: Telephone etiquette and Official phone conversations
3. Reading short passages (3 passages, one from each – Physics, Chemistry, Mathematics/Computer Science)
4. Writing: Letters and Emails in professional context
5. Grammar in Context:
 - Wh and yes or no,
 - Q tags
 - Imperatives
6. Vocabulary in Context: Word formation - .
 - i) Creating antonyms using Prefixes
 - ii) Intensifying prefixes (E. g inflammable)Changing words using suffixes
 - A) Noun Endings
 - B) Adjective Endings
 - C) Verb Endings

UNIT 2: DESCRIPTION

Listening – Listening to process description
Speaking - Role play
Formal: With faculty and mentors in academic environment, workplace communication
Informal: With peers in academic environment, workplace communication
Reading –Reading passages on products, equipment and gadgets
Writing – Writing sentence definitions (e.g. computer) and extended definitions (e.g. artificial intelligence)
Picture Description – Description of Natural Phenomena
Grammar in Context: Connectives and linkers.
Vocabulary – Synonyms (register) - Compare & contrast expressions.

UNIT 3: NEGOTIATION STRATEGIES

Listening - Listening to interviews of specialists / inventors in fields (Subject specific)
Speaking – Brainstorming. (mind mapping). Small group discussions (subject-specific)
Reading – longer Reading text. (Comprehensive passages)
Writing – Essay Writing (250 word essay on topics related to subject area, like pollution, use of pesticides in cultivation, merits and demerits of devices like mobile phones, merits and demerits of technology in development)
Grammar in Context: Active voice & Passive voice – If conditional - Collocations –Phrasal verbs

UNIT 4: PRESENTATION SKILLS

- Listening - Listening to presentation. Listening to lectures. Watching –documentaries (discovery / history channel)
- Speaking –Short speech
- Making formal presentations (PPT)
- Reading – Reading a written speech by eminent personalities in the relevant field /Short poems / Short biography.
- Writing - Writing Recommendations
- Interpreting visuals - charts / tables/flow diagrams/charts
- Grammar in Context – Modals
- Vocabulary (register) - Single word substitution

UNIT 5: CRITICAL THINKING SKILLS

- Listening - Listening to advertisements/news and brief documentary films (with subtitles)
- Speaking – Simple problems and suggesting solutions.
- Reading: Motivational stories on Professional Competence, Professional Ethics and Life Skills (subject-specific)
- Writing Studying problem and finding solutions- (Essay in 200 words)
- Grammar-Make simple sentences
- Vocabulary -Fixed expressions

SUGGESTED ACTIVITIES

UNIT 1

- Listening: Links for formal conversation can be given - Gap filling exercises – Multiple Choice questions – Making notes.
- Speaking - Role play activity
- Reading – Note making. Note-Taking.
- Writing: Guided Writing (developing hints)
- Email
- Grammar: Vocabulary – Worksheets – Games.

UNIT 2

Listening-

- Process Descriptions (Processes of Condensation and Evaporation./Process of Measuring the thickness of a wire using a Screw -Gauge./process of Exaction of sugar from sugarcane)
- Speaking – Role Play
- Reading – Multiple choice questions - Evaluative answers – Classifying and labeling
- Writing - Picture description – Description of natural phenomena (rainbow, earthquake, volcanic eruption, erosion, natural disasters in 150 to 200 words).
- Vocabulary: Expansion of compound nouns

UNIT 3

- Listening- Gap fill exercises – Listening comprehension
- Speaking -Debates
- Reading -Reading comprehension
- Writing – Essay Writing
- Grammar - Vocabulary, Activities, Worksheets & Games.

UNIT 4

- Listening - Note taking (of listening & viewing items) - Filling a table based on the listening item.
- Speaking – JAM, Presentations. (PPT-TECHNICAL)
- Reading-Reading comprehension
- Writing– Difference between recommendations and instructions
Questions/MCQs based on graphs/flow diagrams/charts
- Grammar: Vocabulary – Activities, Worksheets & Games.

UNIT 5

- Listening – Radio News/ TV-News telecast /

Speaking - Watch or listen to documentaries and ask questions
Reading - Reading motivational stories (success stories in subject area)
Writing - Essay writing.
Grammar -Vocabulary –Activities, Worksheets & Games

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Semester	Code	Title of the Course				Hours	Credits				
I	20UCA1PE1	PROFESSIONAL ENGLISH PHYSICAL SCIENCES				2	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓	✓	✓		✓		✓	
CO2	✓	✓	✓	✓	✓	✓		✓	✓		
CO3	✓	✓	✓	✓	✓		✓	✓	✓		
CO4	✓	✓	✓	✓	✓		✓				
CO5	✓	✓	✓	✓	✓		✓	✓		✓	
Number of Matches (✓) = 38, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER - II

(For the candidates admitted from the academic year 2020-2021 onwards)

SEMESTER-II

Course Code : 20UCA2CC2
Instruction Hours : 5
Credits : 5

Exam Hours : 3
Internal Marks : 25
External Marks : 75

CORE COURSE - II PROGRAMMING IN C++

Course Outcomes

- Understand the features, in C++ , supporting object oriented programming.
- Understand the concepts of arrays, functions, encapsulation, class and object, constructor and destructor in object- oriented programming
- Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, operator overloading, inheritance and polymorphism
- Understand advanced features of C++ specifically stream I/O and files.
- Understand advanced features of C++ templates and Exception handling

UNIT I

Object-Oriented Programming: Principles – Benefits of OOP – Application of OOP – Tokens, Expression and Control Structures: Tokens – Keywords – Identifiers and Constants – Data types – Constants – Variables – Operators – Manipulators – Expressions – Control Structure.

UNIT II

Functions – Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – const Arguments – Function Overloading – Friend and Virtual Functions, Classes and Objects – Class – Member Functions – Arrays with in a Class – Memory Allocation for Objects – Static data members – Static member functions – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects – const Member Functions – Pointers to Members, Constructors and Destructors.

UNIT III

Operator Overloading and Type Conversions, Inheritance: Extending Classes – Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes, Pointers, Virtual Functions and Polymorphism: Pointers – Pointers to Objects –this Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions.

UNIT IV

Managing I/O Operations: C++ Streams – C++ Stream Classes – Unformatted I/O and Formatted I/O Operations – Managing Output with Manipulators, Working with Files: Classes for File Stream Operations – Opening and Closing a File – Detecting end-of-file – File Pointers and Their Manipulators – Sequential I/O Operations – Updating a File – Error Handling during File Operations – Command Line Arguments

UNIT V

Templates: Class Templates – Class Templates with Multiple Parameters – Function Templates – Function Templates with Multiple Parameters – Overloading of Template Functions – Member Function Templates – Non-Type Template Arguments, Exception Handling: Basics - Exception Handling Mechanism – Throwing Mechanism – Catching Mechanism – Rethrowing an Exception – Specifying Exceptions.

Text Book

Object Oriented Programming With C++, E. Balagurusamy, McGraw Hill Education Private Limited, 7th Edition, 2018.

Reference Books

1. C++ The Complete Reference, Herbert Schildt, 5th Edition , 2012.
2. Mastering in C++, K. R. Venugopal et al, TMH, 2nd Edition, 2010.
3. Bjarne Stroustrup, “The C++ programming language”, Addison Wesley, fourth edition, 2013.

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Semester	Code	Title of the Course				Hours	Credits				
II	20UCA2CC2	PROGRAMMING IN C++				5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓			✓		✓	
CO5		✓		✓	✓		✓	✓		✓	
Number of Matches (✓) = 39, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER-II

Course Code : 20UMA2AC2
Instruction Hours : 5
Credits : 3

Exam Hours : 03
Internal Marks : 25
External Marks : 75

ALLIED COURSE - II OPERATIONS RESEARCH

Course Outcomes

- Recognize and relate LPP and solving LPP using graphical and simplex method.
- Explain Transportation problem and Evaluate its initial basic feasible solution
- Discuss and solve assignment problems using Hungarian algorithms.
- Describe and Construct Network and compute PERT and CPM

UNIT - I

Linear Programming Problem: Introduction - Graphical Solution Method – General Linear Programming Problem - Canonical and Standard forms of LPP.

UNIT - II

Linear Programming Problem (Continued): Introduction - Simplex Method for $<$, $=$, $>$ constraints – Big-M Method.

UNIT - III

Transportation Problem: Introduction – LP formulation of the Transportation Problem – Finding an Initial Basic Feasible Solution - Transportation Algorithm (Modi Method) – Unbalanced Transportation Problem.

UNIT - IV

Assignment Algorithm: Introduction- Mathematical Formulation of the Problem – Solution Methods of Assignment Problem – Special Cases in Assignment Problems.

UNIT - V

Networks: Introduction – Network (Basic Components) – Logical Sequencing – Rules of Networking Construction – Concurrent Activities - CPM computation- PERT computation.

Text Book

1. KantiSwarup, P.K.Gupta and Man Mohan, Operations Research, Sultan Chand & Co.Ltd.2012

Unit-I	Chapter-3	Sections 3.1 to 3.5
Unit-II	Chapter-4	Sections 4.1, 4.3 & 4.4
Unit-III	Chapter-10	Sections 10.1, 10.2, 10.9 to 10.13 & 10.15
Unit-IV	Chapter-11	Sections 11.1 to 11.4
Unit-V	Chapter -25	Sections 25.1 to 25.7.

Reference Books

1. PremKumar,Gupta and D.S. Hira, “Operations Research”, An Introduction, S. Chand and Co., Ltd. New Delhi,
2. Hamdy.A.Taha, “Operations Research”, Seventh Edition, McMillan Publishing Company, New Delhi, 1982.

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SEMESTER-II

Course Code : 20UCA2PE2
Instruction Hours : 2
Credits : 2

Exam Hours : 03
Internal Marks : 25
External Marks : 75

PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES- II

Course Objectives:

- The Professional Communication Skills Course is intended to help Learners in Arts and Science colleges
- Develop their competence in the use of English with particular reference to the workplace situation.
- Enhance the creativity of the students, which will enable them to think of innovative ways to solve issues in the workplace.
- Develop their competence and competitiveness and thereby improve their employability skills.
- Help students with a research bent of mind develop their skills in writing reports and research proposals.

Course Outcomes

- At the end of the course, learners will be able to,
- Attend interviews with boldness and confidence.
- Adapt easily into the workplace context, having become communicatively competent.
- Attain knowledge about digital competence.
- Apply to the Research & Development organizations/ sections in companies and offices with winning proposals.

Instruction to Course Writers:

- Acquisition of subject-related vocabulary should not be overlooked. Textboxes with relevant vocabulary may be strategically placed as a Pre Task or in Summing Up
- Grammar may be included if the text lends itself to the teaching of a Grammatical item. However, testing and evaluation does not include Grammar.

UNIT I- Communicative Competence

(18 hrs)

Listening – Listening to two talks/lectures by specialists on selected subject specific topics -(TED Talks) and answering comprehension exercises (inferential questions)

Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions)

Reading: Two subject-based reading texts followed by comprehension activities/exercises

Writing: Summary writing based on the reading passages.

Grammar and vocabulary exercises/tasks to be designed based on the discourse patterns of the listening and reading texts in the book. This is applicable for all the units.

UNIT II - Persuasive Communication

(18 hrs)

Listening: listening to a product launch- sensitizing learners to the nuances of persuasive communication

Speaking: debates – Just-A Minute Activities

Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions

Writing: dialogue writing- writing an argumentative /persuasive essay.

UNIT III- Digital Competence

(18 hrs)

Listening to interviews (subject related)

Speaking: Interviews with subject specialists (using video conferencing skills)

Creating Vlogs (How to become a vlogger and use vlogging to nurture interests – subject related)

Reading: Selected sample of Web Page (subject area)

Writing: Creating Web Pages

Reading Comprehension: Essay on Digital Competence for Academic and Professional Life.

The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

UNIT IV - Creativity and Imagination

(18 hrs)

Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. <https://www.youtube.com/watch?v=tpvicScuDy0>)

Speaking: Making oral presentations through short films – subject based

Reading: Essay on Creativity and Imagination (subject based)

Writing – Basic Script Writing for short films (subject based)

Creating blogs, flyers and brochures (subject based)

Poster making – writing slogans/captions(subject based)

UNIT V- Workplace Communication& Basics of Academic Writing

(18 hrs)

Speaking: Short academic presentation using PowerPoint

Reading & Writing: Product Profiles, Circulars, Minutes of Meeting.

Writing an introduction, paraphrasing

Punctuation(period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis)

Capitalization (use of upper case)

Semester	Code	Title of the Course					Hours	Credits				
II	20UCA2PE2	PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES-II					2	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓		
CO2	✓	✓	✓	✓	✓	✓	✓		✓			
CO3	✓	✓	✓	✓	✓			✓	✓	✓		
CO4	✓	✓	✓	✓	✓		✓					
CO5	✓	✓	✓	✓	✓	✓		✓		✓		
Number of Matches (✓) = 39, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER-II

Course Code : 20UCA2CP2
Instruction Hours : 4
Credits : 2

Exam Hours:03
Internal Marks:40
External Marks:60

CORE PRACTICAL -II PROGRAMMING IN C++ LAB

Course Outcomes

- Able to make use of objects and classes for developing programs.
- Able to use various object oriented concepts to solve different problems.
- Able to write programs using constructor and destructor
- Able to develop programs using inheritance and Polymorphism
- Able to develop programs using files.

List of Programs

1. Define a class to represent a bank account. Include the following members:
Data members : Name of the depositor, Account number, Type of account Balance amount in the account
Member functions : To assign initial values, To deposit an amount, To withdraw an amount after checking the balance, To display the name and balance.
Write a C++ program to invoke the member functions.
2. Write a C++ program to display the bio-data of the student using inline functions.
3. Write a C++ program To create a class "student", to create different objects and to test the functioning using Constructors and Destructors
4. Write a C++ program to find means of giving numbers using friend function.
5. Write a C++ program to find volume of cube, cylinder and rectangle using function overloading.
6. Write a C++ program using arrays of objects.
7. Write a C++ Program to add two complex numbers using operator overloading
8. Write a C++ program using virtual functions.
9. Write a C++ program using String handling functions.
10. Write a C++ program using single inheritance for the data members such as name, roll number, sex, height and weight and display the contents.
11. Write a C++ program using file concept.

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Semester	Code	Title of the Course					Hours	Credits				
II	20UCA2CP2	PROGRAMMING IN C++ LAB					4	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓		
CO2	✓	✓	✓	✓	✓	✓	✓		✓			
CO3	✓	✓	✓	✓		✓		✓	✓	✓		
CO4	✓	✓	✓		✓	✓	✓		✓	✓		
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Number of Matches (✓) = 43, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER - III

(For the candidates admitted from the academic year 2020-2021 onwards)

SEMESTER – III

Course Code : 20UCA3CC3
Instruction Hours : 6
Credit : 4

Exam Hours : 03
External Marks : 75
Internal Marks : 25

CORE COURSE III OBJECT ORIENTED PROGRAMMING USING JAVA

Course Outcomes

After completing this course the student must demonstrate the knowledge and ability to:

- Able to understand the use of OOPs concepts.
- Able to solve real world problems using OOP techniques.
- Able to understand the use of abstraction.
- Able to understand the use of Packages and Interface in java.
- Able to develop and understand exception handling, multithreaded applications with synchronization.
- Able to design GUI based applications and develop applets for web applications.

UNIT I

Java Evolution: Java History-Features- How Java Differs From C&C++ -Java And Internet – Web Browsers – Hardware And S/W Requirement – Java Environment. **Overview Of Java Language:** Introduction – Simple Java Program - Java Tokens – Java Statement – Implementing A Java Program – JVM – Command Line Argument – Programming Style. **Constants Variables And Data Types:** Constants – Variables – Declaration Of Variable – Giving Values To Variables – Scope Of Variables – Symbolic Constants – Type Casting.

UNIT II

Operators And Expressions: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Precedence Of Arithmetic Operators –Type Conversions In Expressions – Operator Precedence And Associability – Mathematical Functions. **Decision Making And Branching:** Introduction – Decision Making With If Statement – Simple If Statement – The If... Else Statement – Nesting Of If...Else Statement – The Else If Ladder – The Switch Statement – The ?:Operator. **Decision Making And Looping:** Introduction – The While Statement – The Do Statement – The For Statement – Jumps in Loops – Labeled Loops.

UNIT III

Classes and Methods: Defining a Class – Method Declaration – Creating Objects – Constructors – Method Overloading – static members – Inheritance – Method Overriding – Final variable and classes.**Arrays, Strings and Vectors:** Arrays – one dimensional arrays – creating an array – two dimensional array – strings – vectors – wrapper classes. **Interfaces:** multiple inheritance Introduction – defining interfaces – extending interfaces – implementing interfaces – accessing interface variables.

UNIT IV

Packages: Putting Classes Together: Introduction – System Packages – Using System Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes. **Multithreading Programming:** Introduction – Creating Threads – Extending The Threads – Stopping And Blocking A Thread – Life Cycle of a Thread – Using Thread Methods. **Managing Errors And Exceptions:** Introduction – Types of Errors – Exception – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exception – Using Exceptions For Debugging.

UNIT V

Applet Programming: Introduction – How Applet Differ From Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML File – Running The Applet – More About Applet Tag – Passing Parameters To Applets – Aligning the Display – More About HTML Tags – Displaying Numerical Values – Getting Input From the User. **Graphics Programming:** Introduction – The Graphics Class – Lines And Rectangles – Circles And Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.

Text Book : Programming with Java - E. Balagurusamy 6th Edition 2019

References Books:

1. Let us Java - Yashavant Kanetkar - BPB Publications, New Delhi - First Edition 2012.
2. An Introduction to OOPS with Java - C Thomas WU - TataMc-Graw Hill, New Delhi - 4th Edition.
3. Object oriented Programming through Java - ISRD Group - TataMc-Graw Hill, New Delhi - Eight Reprint 2011

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Semester	Code	Title of the Course					Hours	Credits				
III	20UCA3CC3	OBJECT ORIENTED PROGRAMMING USING JAVA					6	4				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CO2	✓	✓		✓	✓	✓	✓	✓				
CO3	✓	✓	✓		✓	✓	✓	✓	✓			
CO4	✓	✓			✓	✓	✓	✓		✓		
CO5	✓	✓		✓		✓	✓	✓		✓		
Number of Matches (✓) = 39, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER III

Course Code : 20UMS3AC3
Instruction Hours : 4
Credits : 4

Exam Hours: 03
Internal Marks: 75
External Marks:25

ALLIED COURSE III FINANCIAL ACCOUNTING

Course Outcomes

After completing the course the student will be able to

- Define book keeping and accounting
- Explain the general purposes and functions of accounting and describe the main elements of financial accounting information – assets, liabilities, revenue and expenses.
- Calculate depreciation in various methods
- Locate and rectification of errors.
- Apply the computer applications in accounting

UNIT I

Accounting concepts – conventions – Rules of Double entry – Journal – ledger – Trial Balance

UNIT II

Trading Account, Profit and Loss Account, Balance sheet, subsidiary Books – Purchases Book, Sales Book, Cash Book, Simple cash book, petty cash book

UNIT III

Depreciation accounting straight line method, written down value method and annuity method

UNIT IV

Rectification of errors, Basic principles for Rectification of Errors, suspense account, Errors disclosed by Trial Balance, Guidelines to locate Errors in the Trial balance.

UNIT V

Computer Accounting and Algorithm – Areas of application of computer in Accounting, features and advantages of computers and computer accounting – Algorithm, Requisites of an effective Algorithm – features of algorithm

Theory 40% & Problems 60%

Text Books

1. Financial Accounting – T.S. Reddy and A. Murthy – Margham Publications.
2. Financial and Management Accounting – T.S. Reddy and Y. Hari Prasad Reddy Margam Publications

Reference Books

1. Advanced Accountancy – M.c. Shukla T.S. Grewal & SC Gupta – S. Chand and co.
2. Fundamentals of Advanced Accounting – Volume I Pillai and Bagavathy S. chand & Co.
3. Financial Accounting – B. Charumathy and L. Vinayagam – S. Chand & Company

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HOD

Semester	Code	Title of the Course					Hours	Credits			
III	20UMS3AC3:1	Financial Accounting					4	4			
Course Outcomes (COs)	Programme Outcomes(POs)					Programme Specific Outcomes(PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO2	✓	✓			✓	✓	✓	✓		✓	
CO3	✓	✓		✓	✓	✓		✓	✓	✓	
CO4	✓	✓		✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of Matches(✓) = 44 Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – III

Course Code: 20UCA3CP3
Instruction Hours : 3
Credit : 2

Exam Hours : 03
Internal Marks: 40
External Marks: 60

CORE PRACTICAL III **OBJECT ORIENTED PROGRAMMING USING JAVA LAB**

Course Outcomes

- Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
- Read and make elementary modifications to Java programs that solve real-world problems.
- Validate input in a Java program.
- Identify and fix defects and common security issues in code.
- Document a Java program using Javadoc.
- Use a version control system to track source code in a project.

List of Programs:

1. Write Java Program using Control Statements to perform all the arithmetic operations using switch statement.
2. Write Java Program using String Handling functions for Count the number of vowels, consonants and words in a given sentence.
3. Write Java program to Arrange the set of names in Alphabetical order.
4. Write Java program using Classes and Objects to prepare student mark list.
5. Write Java program using Inheritance prepare EB Bill.
6. Write Java program using Interfaces and package to display employee payroll.
7. Write Java program using Multithreading.
8. Write Java program using Exception Handling to display 5 exceptions.
9. Write an Applet program to prepare a BIO-DATA.
10. Write an Applet program to create different shapes.

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Semester	Code	Title of the Course					Hours	Credits				
III	20UCA3CP3	OBJECT ORIENTED PROGRAMMING USING JAVA LAB					3	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3			✓	✓	✓	✓		✓	✓	✓		
CO4	✓	✓	✓		✓	✓		✓		✓		
CO5	✓	✓		✓	✓	✓	✓	✓		✓		
Number of Matches (✓) = 38, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – III

Course Code: 20UMS3AP1

Instruction Hours : 3

Credit : 2

Exam Hours : 03

Internal Marks: 40

External Marks: 60

ALLIED PRACTICAL –I

ACCOUNTING PACKAGE LAB

Course Outcomes

- Illustrate how to create company and meaning for each field in company creation
- Demonstrate ledger, different voucher head, voucher entry and balance sheet creation
- Illustrate creation of different report for a company

List of Programs

1. Creation/Setting up of a Company
2. Setting up Account Heads
3. Voucher entry and generation of reports
4. Creation of Ledger and Balance Sheet
5. Generating and Printing Inventory reports

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Semester	Code	Title of the Course					Hours	Credits				
III	20UCS3AP3	ACCOUNTING PACKAGE LAB					3	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓	✓		✓	✓		✓	✓	✓			
CO4	✓	✓			✓	✓	✓	✓		✓		
CO5	✓	✓	✓	✓		✓	✓	✓	✓			
Number of Matches (✓) = 38, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – III

Course Code: 20UCA3NME1
Instruction Hours : 2
Credit : 2

Exam Hours :03
External Marks :75
Internal Marks :25

NON MAJOR ELECTIVE - I FUNDAMENTALS OF COMPUTERS

Course Outcomes

- Bridge the fundamental concepts of computers with the present level of knowledge of the students and to understand binary, hexadecimal and octal number systems and their arithmetic.
- Distinguish the organization of various parts of a system memory hierarchy and processors
- Understand how to convert between binary and decimal numbers and to represent signed binary numbers with 1 and 2's complement. Understand Boolean algebra forms as the basics of digital computer.
- Familiarize operating systems and generations of computers
- To develop an understanding of computer networking basics and different components of computer networks and various protocols

UNIT I

Computer basics: Algorithms- A simple model Of a computer- characteristic of computers- problem solving using computers- **Data Representation:** Representation of Characters in computers- Representation of Integers- Hexadecimal representation of Numbers- Decimal to binary conversion- Error detecting codes- Input/output Lines: Description of computer input units- Other input methods- Computer output units

UNIT II

Computer Memory: Memory Cell- Memory Organization- Read Only Memory- Serial Access Memory- Physical device to construct memories- Magnetic Hard disk- Floppy disk drives- Compact Disk ROM- Magnetic tape drives- **Processors:** Structure of Instructions- Description of a Processor- A machine language program

UNIT III

Binary addition- Binary Subtraction- Signed Numbers- Two's complement representation of numbers- Addition/Subtraction of Numbers in 2's complement notation- Binary multiplication- Binary division- Floating point representation of numbers- Arithmetic operations with normalized floating point numbers- **Logic circuits:** Introduction- Switching circuits- AND/ OR Operations- NOT operation- Boolean function- Postulates- Duality Principle- Theorems- Precedence of operators- Venn Diagrams- Truth table- Canonical forms for Boolean function- Logic circuits- Parallel and serial adders- Physical and serial adders- Transistors- Integrated circuits

UNIT IV

Computer Languages: Need for programming language- Assembly language- Higher level programming language- Compiling high level language program- some high level languages- Operating Systems: Need for OS- Batch Operating system- Multiprogramming Operating system- Time sharing Operating system- Personal computer operating system- The UNIX Operating system- Microkernel based Operating system- Online and Real time systems- **Computer Generation and Classification:** First generation of computers- Second generation computer- Third generation computer- fourth generation- fifth generation- Classification of Computers- Distributed Computer system- Parallel Computers

UNIT V

Computer And Communication: Types of Communication with and among computers- Need for computer communication networks- Internet and WWW- Characteristics of communication channel- Allocation of channel- Physical communication media- Establishing channels for communication- Computer network topologies- Communication Protocols- LAN- ATM networks- Interconnecting Networks- Computer Networks: Computer graphics applications- Display devices- Overview of Display method- Raster Scan Display processing unit- Input devices for interactive graphics

Text Book:

V. Rajaraman, Fundamentals of Computers, 6th Edition, Prentice Hall India Pvt., Limited, 2009.

Reference Book:

Pradeep K. Sinha and Priti Sinha, Computer Fundamentals, 6th Edition, BPB Publications, 2007.

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Semester	Code	Title of the Course				Hours	Credits				
III	20UCA3NME1	FUNDAMENTALS OF COMPUTERS				2	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓			
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓		✓	✓	✓		✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓			✓	
CO5	✓	✓		✓	✓	✓		✓			
Number of Matches (✓) = 37, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER- III

Course Code : 20UMS3NME1
Instruction Hours : 2
Credits : 2

Exam Hours: 03
Internal Marks: 75
External Marks:25

NON- MAJOR ELECTIVE I EVENT MANAGEMENT

Course Outcomes

- Define an event concept and set objectives bases on this.
- Explain all the components and various roles involved in planning, organizing, running and evaluating an event;
- Assess all post-event activities.
- Apply the theory and skills necessary to professionally plan, and organize a outdoor event
- Understand the importance of strategic planning for an event or festival, including monitoring and evaluating the impacts on the wider community.

UNIT I

Designing corporate events that meet customer's needs – fundamentals of corporate hospitality – Managing customer expectations – Types of corporate events.

UNIT II

In-house vs. event management companies – Corporate event packages – Staff events – Customer events -Team building – Nature of Teams – Types of Teams.

UNIT III

Charity Events and Award Ceremonies – Setting fund raising targets and objectives – Working with volunteers and committees – Generating goodwill and media exposure – Commissioning celebrities.

UNIT IV

Outdoor Events - Concerts – Logistics – Risk Management – Types of outdoor events – Risk management – Planning and logistics, Marketing and sponsorship.

UNIT V

Celebrity events- Concerts – Launches – Fashion shows – National festivals and high-profile charity events – Liaising with agents – Contract negotiations – Client briefings – Celebrity wish lists and expectations – Paparazzi and entourages.

PRACTICUM

Organize an event and submit a report .

Text Books

1. Lynn Van Derwagen “Event Management” New Delhi, Pearson Publications.
2. Sharma D. “Event Planning and Management” New Delhi, Deep &Deep Publishers Pvt. Ltd.

Reference Books

1. HarichandanC.B. “Event Management”, New Delhi. Global Vision Publishing House.
2. Cherylrimball, “Event Planning Business” New Delhi, Entrepreneur press.
3. Sita Ram Singh “Event Management” New Delhi, APH Publications Corporation.

Semester	Code	Title of the Course				Hours	Credits			
III	20UMS3NME1	Event Management				2	2			
Course Outcomes (COs)	Programme Outcomes(POs)					Programme Specific Outcomes(PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓		✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓		✓	✓	✓		✓	✓	✓	✓
Number of Matches(✓) = 44 Relationship: High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER - IV

(For the candidates admitted from the academic year 2020-2021 onwards)

SEMESTER – IV

Course Code: 20UCA4CC4

Instruction Hours : 5

Credit : 4

Exam Hours : 03

External Marks: 75

Internal Marks: 25

CORE COURSE IV PYTHON PROGRAMMING

Course Outcomes

On completion of the course the students will be able to:

- Identify the problem solving techniques
- Recognize Python shell
- Identify Operators
- Understand the structure of python programming
- Understand the control statements
- Identify the structures-& Functions Visualize the OOPs concepts-
- Understand Exception handling

UNIT I: Planning the Computer Program and Problem solving techniques : Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. Flow charting, decision table, algorithms, structured programming concepts, Programming methodologies viz. Top-down and bottom-up programming.

UNIT II: Overview of Programming & Introduction to Python: Structure of a Python Program , Elements of Python. Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic Operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator ,Bitwise operator, Increment or Decrement operator).

UNIT III: Creating Python Programs: Input and Output Statements, Control Statements (Looping while Loop, for Loop, Loop Control, Conditional Statement-if...else, Difference between break, continue and pass).

UNIT IV: Structures& Functions: Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments .

UNIT V: Classes, Object-oriented Programming and Exception: Abstract Data Types and Classes, Inheritance, Encapsulation and Information hiding, handling exceptions.

Text Books

John V Guttag. —Introduction to Computation and Programming Using Python, Prentice Hall of India

Reference Books

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011

2. Python Tutorial/Documentation www.python.org2010

3. Allen Downey, Jeffrey Elkner, Chris Meyers ,How to think like a computer scientist :Learning with Python, Freely available online.2012

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Semester	Code	Title of the Course	Hours	Credits

IV	20UCA4CC4	PYTHON PROGRAMMING				5	4				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓			
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓		✓	✓	✓	✓	✓		✓	
CO5	✓	✓		✓	✓	✓	✓	✓		✓	
Number of Matches (✓) = 41, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER IV

Course Code : 20UMS4AC4
Instruction Hours : 4
Credits : 4

Exam Hours:03
Internal. Marks:25
External Marks:75

ALLIED COURSE – IV PRINCIPLES OF MANAGEMENT

Course Outcomes

After completing the course the student will be able to

- Describe the evolution of management thought
- Integrate the planning with decision making process of a given organization.
- Relate the function of organizing with staffing in consideration of their effort on individual actions.
- Identify the range of leadership. motivation and communication existing in the organisation .
- Know about controlling tools available in the management.

UNIT I

Management – Concept – Evolution - Nature –Management as a Science, an Art and Profession – Process – Levels of management – F.W. Taylor’s Scientific Management – Fayol’s Theory of Management – Modern Management - Recent trends in management.

UNIT II

Nature and purpose of planning- Planning process- Types of plans- Objectives- Managing by Objective (MBO). Strategies- Types of strategies – Policies – Decision Making- Types of decision-Decision making process- Decision making under different conditions.

UNIT III

Organizing – Concept – Organisation as a process – Elements of Organization process – Types of organization – Delegation – Departmentation – Span of Control - Centralization – Decentralisation.

UNIT IV

Staffing - Functions – Process – Selection – Recruitment – Training. Direction –Elements of Direction – Principles of Direction – Process of Direction.

UNIT V

Co-ordination – Controlling – Concept – Need and importance – Process – Types - Characteristics of an ideal control system – Budgetary Control.

Text Books

1. Prasad L.M. Principles and Practice of Management, New Delhi, Sultan Chand & Sons, 9th Edition, 2015.
2. Tripathy P.C, Reddy P.N. Principles of Mangement, New Delhi, Mc-Graw Hill Publishing company Ltd,5th Edition, 2012.

Reference Books

1. Harold Koontz, Heinz wehrich, ramachandra Aryasri, Principles of Management, New Delhi, Mc-Graw Hill Publishing company Ltd.,Reprint 2004.
2. Govindharajan. M. Natarajan S. Principles of Management, New Delhi, PHI Learning Private Limited, 2nd Edition 2007.
3. Rao V.S.P., Narayana P.S. Principles and Practice of Management, 1st Edition, 1996, Delhi, Konark Publishers Private Ltd.

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HOD

Semester	Code	Title of the Course					Hours	Credits			
IV	20UMS4AC4:1	Principles of Management					4	4			
Course Outcomes (COs)	Programme Outcomes(POs)					Programme Specific Outcomes(PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓		✓	✓	✓	✓		✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓	
CO5	✓		✓	✓	✓		✓	✓	✓	✓	
Number of Matches(✓) = 44 Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – IV

Course Code : 20UCA4CP4
Instruction Hours: 3
Credit : 2

Exam Hours :03
External Marks : 60
Internal Marks : 40

CORE PRACTICAL IV PYTHON PROGRAMMING LAB

Course Outcomes

- Perform Procedures as per Laboratory Standards in the area of functions
- Execute Procedures as per Laboratory Standards in the area of branching
- Perform Procedures as per Laboratory Standards in the area of conversions
- Accomplish Procedures as per Laboratory Standards in the area of Exception handling
- Perform Procedures as per Laboratory Standards in the area of control statements
- Implement Procedures as per Laboratory Standards in the area of string functions
- Perform Procedures as per Laboratory Standards in the area of OOPs
- Execute Procedures as per Laboratory Standards in the area of Set and List

List of Programs

1. Write a Program to arithmetic calculation using input functions.
2. Write a Program to find prime number.
3. Write a Program to find biggest number among three numbers.
4. Write a Program to find leaf or non leaf year using nested if functions
5. Write a Program to using switch statement to display Monday to Sunday.
6. Write a Program using string functions
7. Write a Program using class, method & object
8. Write a Program using Exception handling
9. Write a Program Using set
10. Write a Program Using List

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Semester	Code	Title of the Course					Hours	Credits			
IV	20UCA4CP4	PYTHON PROGRAMMING LAB					3	2			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓			
CO4	✓	✓	✓	✓		✓		✓	✓		
CO5	✓	✓	✓	✓	✓	✓	✓			✓	
Number of Matches (✓) = 40, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – IV

Course Code : 20UMS4AP2
Instruction Hours: 02
Credit : 02

Exam Hours :03
External Marks : 60
Internal Marks : 40

ALLIED PRACTICAL - II
INVENTORY MANAGEMENT LAB

Course Outcomes

- Be familiar with various create stock group and categories.
- Create a valid to stock item and inventory info.
- Able to create inventory masters.
- Able to create national traders, stock group.
- Develop a inventory report generation.

List of Programs

1. Creating Stock Groups with Stock categories features.
2. Create Godowns /locations for the stock.
3. Create Unit of Measure for the stock.
4. Create Stock item in the Inventory info.
5. Creating inventory masters for national traders
6. Displaying and altering stock group, unit of stock, stock
7. Inventory related report generation

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Semester	Code	Title of the Course				Hours	Credits				
IV	20UMS4AP2	INVENTORY MANAGEMENT LAB				2	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓		✓	
CO2	✓	✓		✓	✓	✓	✓		✓		
CO3	✓	✓		✓	✓	✓	✓	✓	✓		
CO4	✓	✓	✓		✓	✓	✓	✓		✓	
CO5	✓	✓		✓		✓	✓	✓			
Number of Matches (✓) = 37, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – IV

Course Code : 20UCA4NME2
Instruction Hours : 02
Credit : 02

Exam Hours : 03
External Marks : 75
Internal Marks : 25

NON MAJOR ELECTIVE 2 INTERNET AND ITS APPLICATIONS

Course Outcomes

- Describe fundamental concepts of internet and its application
- Understand technology related to internet
- Understand history of HTML and basic tags
- Illustrate how to create body section of HTML document
- Demonstrate how to use advance tags in HTML document

UNIT I:

Introduction to the Internet: Computers in Business – Networking – Internet – Electronic Mail – Resource Sharing – Gopher – World Wide Web – Usenet – #Telnet# – Bulletin Board Service – Wide Area Information Service .

UNIT II:

Internet Technologies: Modem – Internet Addressing – Physical Connections – Telephone Lines. Internet Browsers: Internet Explorer –Netscape Navigator

UNIT III:

Introduction to HTML: Designing a Home Page – History of HTML – HTML Generations – HTML Documents –Anchor Tag – Hyper Links.

UNIT IV:

Head and Body Sections: Header Section – Title – Prologue – Links – Colorful Webpage. Designing the Body Section: Heading Printing – Aligning the Headings.

UNIT V:

Ordered and Unordered Lists: Lists – Unordered Lists – Ordered Lists Table Handling: Tables – Table Creation in HTML – Width of the Table and Cells.

Text Book

C Xavier, World Wide Web design with HTML, Tata McGraw-Hill Education, 22nd reprint, 2010.

Reference Book

1. Deitel and Deitel, Internet and World Wide Web - How to Program, PHI, Fourth Edition,2008.
2. Sanjay Saxsena, “A First Course in Computer”, Vikas Publishing House, 5th Edition, 2000
3. Ron Mansfield, “Working in Microsoft Office”,Tata Mcgraw Hill, 18th Reprint 2008.

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Semester	Code	Title of the Course	Hours	Credits

IV	20UCA4NME2	INTERNET AND ITS APPLICATIONS				2	2			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓		✓	✓	✓	✓	✓		✓
CO2	✓	✓	✓	✓	✓	✓	✓		✓	
CO3	✓	✓		✓	✓	✓	✓	✓	✓	
CO4	✓	✓				✓	✓			✓
CO5	✓	✓		✓	✓	✓	✓	✓	✓	
Number of Matches (✓) = 37, Relationship: High										

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER - IV

Course Code : 20UMS4NME2
Instruction Hours : 2
Credits : 2

Exam Hours: 03
Internal Marks: 25
External Marks:75

NON- MAJOR ELECTIVE-II ADVERTISING AND SALES PROMOTION

CourseOutcomes

- Develop creative strategies for advertising
- Develop strategic plan for sales promotion
- Analyze the pros and cons of various media
- Prepare a effective advertising copy for product and services
- Asses strategic uses of sales promotion

UNIT I

Advertising: Definition, Importance and Functions of Advertising-Role of advertising.

UNIT II

Advertising media- Types of Media: Print Media (Newspaper & Magazines, Pamphlets, Posters & Brochures), Electronic Media(Radio, Television , Audio Visual Cassettes), Other Media (Direct Mail, Outdoor Media), Characteristics, merits & Demerits of media.

UNIT III

Advertising message: Preparing an effective advertising Copy- Elements of a Print Copy: Headlines illustration, body copy, slogan, logo, seal, role of color - Elements of Broadcast copy.

UNIT IV

Forms of sales promotions- Consumer oriented sales promotion; trade oriented sales promotion & Sales force-oriented sales promotion.

UNITV

Major tools of sales promotion- samples point of purchase, displays & demonstrations, exhibitions & fashion shows, sales contests & games of chance and skill, lotteries gifts offers, premium and free goods, price packs, rebates patronage rewards.

PRACTICUM

Create an advertisement for both existing and new products.

Text Books

1. Rajeev. V. Batra. “Advertising Management” New Delhi, Prentice Hall of India Pvt. Ltd.
2. Mahendra Mohan “Advertising Management” New Delhi, Tata McGraw – Hill Publishing.

Reference Books

1. Chunawall.S.A. “Advertising & Sales & Promotion Management”, Mumbai, Himalaya Publications.
2. Thomas C. O’Guinn. Chris T. Allen, “Advertising Management” New Delhi, Cengage Learning India Pvt.,Ltd.,
3. Amandeep Kaur & Gulveenkaru “Advertising & Sales Management” New Delhi, Kalyani Publications.

Semester	Code	Title of the Course					Hours	Credits			
IV	20UMS4NME2	Advertising and Sales Promotion					2	2			
Course Outcomes (COs)	Programme Outcomes(POs)					Programme Specific Outcomes(PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO2	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of Matches(✓) = 47 Relationship: Very High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – IV

Course Code: 20UCA4SBE1
Instruction Hours : 2
Credit : 2

Exam Hours : 03
External Marks: 75
Internal Marks: 25

SKILL BASED ELECTIVE 1 **HARDWARE TROUBLESHOOTING**

Course Outcomes

- Identify basic computer components.
- To gain in-depth knowledge on motherboard controllers and power supply.
- Be acquainted with the various storage devices available.
- Understand different types of networking, various topologies and application of networks.
- To describe various types of printers and basic troubleshooting techniques.

UNIT I:

Fundamentals of PC technology: Fundamental Building Blocks of the PC – Principles of CPU Operations - CPU family & operation.

UNIT II:

Motherboards: Motherboard Controllers and System Resources – The I / O System Bus – Onboard I / O Devices Power Supply, Cooling, and Protection : The Power Supply – Ventilation and Cooling Protection – Power Production and Backup.

UNIT III:

Magnetic Storage –Hard Disk Drives – Optical Storage Devices: Optical Storage Media – CD-ROM Drives – DVD-ROM Drives.

I/O Ports and Devices: Serial Ports – Parallel Ports – Universal Serial Bus.

UNIT IV:

Keyboards and Pointing Devices: - Keyboards – Pointing Devices Modems and Communications: Modems–ISDN–CATV Network Modems–DSL Networking: Networking Fundamentals – Network Hardware – Network Protocols.

UNIT V:

Printers: Types – Printer Attributes – Printer Maintenance – Troubleshooting Tools and Techniques : Tools of the Trade – Basic PC Handling Techniques.

Text Book

The Complete Reference PC Hardware: Craig Zacker, John Rourke – Tata McGrawHill, 18th Reprint, 2001.

Reference Books

1. Govindarajulu. B, IBM PC and clones : Hardware, Trouble shooting and Maintenance. Second edition, Tata-McGraw Hill, (ISBN 0-07-048286-1),2002.
2. Rosch. Winn L., Hardware bible, Sixth edition, Que/Techmedia publishers, 2003 (ISBN 81-7635-696-4).
3. Introduction to PC Hardware and Troubleshooting1st Edition, Michael Meyers(ISBN-13:978-0072226324), 2003.

Semester	Code	Title of the Course				Hours	Credits				
IV	20UCA4SBE1	HARDWARE TROUBLESHOOTING				2	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓	✓	✓	
CO2	✓	✓		✓	✓	✓		✓			
CO3	✓	✓		✓		✓	✓	✓	✓		
CO4	✓	✓		✓	✓	✓	✓		✓	✓	
CO5	✓	✓	✓		✓	✓	✓	✓		✓	
Number of Matches (✓) = 38, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER - V

(For the candidates admitted from the academic year 2020-2021 onwards)

SEMESTER – V

Course Code: 20UCA5CC5

Instruction Hours: 5

Credit: 5

Exam Hours:03

External Marks:75

Internal Marks: 25

CORE COURSE 5 COMPUTER NETWORKS

Course Outcomes

- Understand and explain data communication system and its components.
- Discuss the various error detection and correction techniques.
- Building the skills of sub netting and routing mechanism
- Identify the list of transport layer functions and services.
- Familiarity with application layer protocols and explain HTTP and FTP.

UNIT I:

Overview and Physical Layer: Introduction: Data Communications - Networks - Network Types. - **Network Models:** TCP/IP Protocol Suite (2.2.1-2.2.2-2.2.3) - The OSI Model- **Bandwidth utilization** – Multiplexing - Spread Spectrum- **Transmission Media:** Guided Media-Unguided Media. **Switching:** Circuit Switched Network - Packet Switching – Datagram Networks.

UNIT II:

Error Detection and Correction: Introduction- Cyclic codes (10.3.1, 10.3.2, 10.3.3, 10.3.5) - Forward Error Correction.

Data link Control: Data link layer Protocols- **Media Access Control:** Random Access- Controlled Access- **Wireless Networks:** IEEE 802.1- Bluetooth-Cellular Telephone- Satellite network.

UNIT III:

Network Layer: Packet Switching- Network layer performance- IPV4 Addresses (18-4.1-18.4.2-18.4.3)- **Internet Protocol:** Datagram Format- **Routing Algorithms:** Distance Vector Routing- Link State Routing- Path Vector Routing- IPV6 Addressing.

UNIT IV:

Transport Layer: Transport Layer Protocols (23.2.1-23.2.2-23.2.3-23.2.4) - User Datagram Protocol.

TCP: TCP Services -TCP features – Segment - Flow Control - Error Control- TCP Congestion Control.

UNIT V:

Application Layer: Introduction- Client Server Programming- World Wide Web- HTTP- FTP- Email- DNS.

Text Book

Data Communications and Networking, Behrouz A Forouzan, Tata McGraw Hill, Fifth Edition, 2013 .

Reference Books

1. Data Communications and Networks, AchyutGodbole and AtulKahate, McGraw Hill Education, 2nd Edition, 2011.
2. William Stallings, “Data and Computer Communications”, Eighth Edition, Pearson Education, 2011.
3. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Fifth Edition, Morgan Kaufmann Publishers Inc., 2011.

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HOD

Semester	Code	Title of the Course					Hours	Credits				
V	20UCA5CC5	COMPUTER NETWORKS					5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓		✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓			✓	✓	✓	✓		✓	✓		
CO4	✓	✓	✓	✓	✓	✓		✓		✓		
CO5	✓	✓		✓	✓	✓	✓	✓		✓		
Number of Matches (✓) = 38, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code : 20UCA5CC6
Instruction Hours: 5
Credit : 5

Exam Hours :03
External Marks : 75
Internal Marks : 25

CORE COURSE VI DATA STRUCTURES AND ALGORITHMS

Course Outcomes

- Understand basic data structures such as arrays, linked lists, stacks and queues.
- Solve problem involving graphs, trees and heaps
- Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data
- Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms, min-max algorithm,
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.

UNIT I:

Arrays: Axiomatization – Ordered Lists – Representation of Arrays. **Stacks and Queues:** Fundamentals – Evaluation of Expressions – Multiple Stacks and Queues. **Linked Lists:** Singly Linked List – Linked Stacks and queues – Polynomial addition.

UNIT II:

Trees: Basic Terminology – Binary Trees - Binary Tree Representations – Binary Tree Traversal – Threaded Binary Trees – Binary Tree Representation on Trees. **Graphs:** Terminology and Representations – Traversals, Connected Components and Spanning Trees – Shortest Paths: Single Source All Destinations Shortest Path - All Pairs Shortest Paths - Transitive Closure.

UNIT III:

Introduction: Algorithms – Algorithm Specification -**Elementary Data Structures:** Priority Queues:Heaps, Heap Sort. **Divide and Conquer:** General Method - Binary Search – Finding the Maximum and Minimum - Merge Sort – Quick Sort.

UNIT IV:

Greedy Method: The General Method – Knapsack Problem – Job Sequencing with Deadlines –Optimal Storage on Tapes - Optimal Merge Patterns.

UNIT V:

Backtracking: The General Method – The 8-Queens Problem – Sum of Subsets – Graph Coloring – Hamiltonian Cycles.

Text Books

1. **Fundamentals of Data Structures** – Ellis Horowitz, SartajSahni , Galgotia Publications, 2nd Edition (Unit 1,Unit 2)
2. **Fundamentals of Computer Algorithms** – Ellis Horowitz, SartajSahni and Sanguthevar, Rajasekaran, Galgotia Publications,2nd Edition, 2008 (Unit 3, Unit 4, Unit 5)

Reference Books

1. Schaum's Outline Series to Data Structures, 3rd Edition, Seymour Lipschutz, TMH, 2014.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures & Algorithms, 4th Edition, Pearson Education, New Delhi, 2009.

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HOD

Semester	Code	Title of the Course					Hours	Credits				
V	20UCA5CC6	DATA STRUCTURES AND ALGORITHMS					5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓		✓	✓	✓	✓	✓		✓		
CO2	✓	✓		✓	✓	✓	✓	✓	✓	✓		
CO3	✓	✓			✓	✓	✓	✓	✓			
CO4	✓	✓		✓	✓	✓	✓	✓				
CO5	✓	✓	✓	✓	✓	✓	✓			✓		
Number of Matches (✓) = 39, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code : 20UCA5CC7
Instruction Hours: 5
Credit : 5

Exam Hours :03
External Marks : 75
Internal Marks : 25

CORE COURSE VII RELATIONAL DATABASE MANAGEMENT SYSTEMS

Course Outcomes

- Master the basic concepts and appreciate the applications of database systems.
- Master the basics of SQL and construct queries using SQL.
- To be able to write SQL commands to create tables and insert/update/delete data, and query data in a relational DBMS.
- To well known about Operators and Functions in SQL
- To well Known about Database Administration.

UNIT I:

Introduction to Databases: History and Evolution – Features - Applications - **Technical Tour of My SQL:** An overview of My SQL Architecture – The My SQL Engine.

UNIT II:

SQL Basics: History of SQL – An Overview of SQL – A SQL Tutorial - **My SQL Data types:** Numeric Types – String Types – Data and Time Types- Complex Types.

UNIT III:

MySQL Operators: Arithmetic Operators – Comparison Operators – Logical Operators - Bit Operators - **MySQL Functions:** Math functions, Aggregate functions, String functions, Date and Time functions.

UNIT IV:

Working with Databases and Tables: Creating Databases - Selecting databases for use – Deleting Databases – Creating Tables – Copying Tables - Modifying Tables - Deleting Tables - **Working with Data:** Inserting, Updating and Deleting Records – Retrieving Records - **Joins:** What is a Join? - Types of Join.

UNIT V:

Sub queries: What is a Sub query? – Types of Sub queries **Transactions:** What is a Transaction? - Transaction and ACID properties - Life cycle of Transaction – Controlling Transactional Behavior – Transactions and Performance – **Administration and Configuration :** Database Administration and MySQL – Basic Server Administration and Configuration Tasks– **Security , Access Control and Privileges:** The MySQL Grant Tables – Granting and Viewing User Privileges.

Text Book

1. MySQL Complete Reference – VikramVaswani, First Edition, Mc Graw Hill Publications.2004

Reference Books

1. Database Management Systems – ArunMajumdar&Pritimoy Bhattacharya, 1st Edition, 2007, TMH.
2. Abraham Silberschatz, Henry Korth, and S. Sudarshan, Database System Concepts, Sixth edition, McGraw-Hill.2011.
3. R. Elmasri and S. Navathe, Fundamentals of Database Systems,Sixth Edition, Pearson Education,2011

Semester	Code	Title of the Course					Hours	Credits				
V	20UCA5CC7	RELATIONAL DATABASE MANAGEMENT SYSTEMS					5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓				
CO2	✓			✓	✓	✓	✓	✓				
CO3	✓	✓		✓	✓	✓	✓	✓	✓	✓		
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓			
CO5	✓	✓		✓	✓	✓	✓	✓		✓		
Number of Matches (✓) = 40, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code: 20UCA5CP5

Hours: 4

Credit: 3

Exam Hours:03

External Marks: 60

Internal Marks: 40

CORE PRACTICAL V PHP AND MYSQL LAB

CourseOutcomes

- Analyze the construction of a web page and relate how PHP and HTML combine to produce the web page.
- Compare and contrast PHP variable types, and relate the advantages and disadvantages of PHP variables with local or global scope.
- Formulate, design and create PHP control structures, including selection and iterative structures
- Construct problem definition statements for real life applications and implement a database for the same.
- Design conceptual models of a database using ER modelling for real life applications and also construct queries in Relational Algebra
- Create and populate a RDBMS, using SQL.
- Write queries in SQL to retrieve any type of information from a data base
- Analyze and apply concepts of normalization to design an optimal Department of Computer Application retrieval database.

PHP

1. Write a PHP script using various String handling functions.
2. Write a PHP script using Control flow statements.
3. Create a web page that implements the concept of functions.
4. Create a simple web page using object oriented programming concept.
5. Write a program in PHP that shows the use of Cookies.
6. Create a college application form for Thanthai Hans Roever College using necessary UI components
7. Develop a simple web page that implements the concept AJAX.

MYSQL

1. Create a table and perform the following basic MYSQL operations
 - a) Alter the structure of the table
 - b) Insert values
 - c) Delete values based on constraints
 - d) Display values using various forms of select clause
 - e) Drop the table
 2. Develop MYSQL queries to implement the following set operations
 - a) Union
 - b) Union all
 - c) Intersect
 - d) Intersect all
 3. Develop MYSQL queries to implement the following aggregate functions
 - a) Sum
 - b) Count
 - c) Average
 - d) Maximum
 - e) Minimum
 - f) Group by clause & having clause
 4. Consider the following database for a banking enterprise
 - a) BRANCH(branch-name:string, branch-city:string, assets:real)
 - b) ACCOUNT(accno:int, branch-name:string, balance:real)
 - c) DEPOSITOR(customer-name:string, accno:int)
 - d) CUSTOMER(customer-name:string, customer-street:string, customer-city:string)
 - e) LOAN(loan-number:int, branch-name:string, amount:real)
 - f) BORROWER(customer-name:string, loan-number:int)
- i. Create a table by properly specifying the primary keys and the foreign keys

- ii. Enter at least five tuples for each relation
- iii. Find all the customers who have at least two accounts at the *Main* branch.
- iv. Find all the customers who have an account at *all* the branches located in a specific city.
- v. Demonstrate how you delete all account tuples at every branch located in a specific city.
- vi. Generate suitable reports.
- vii. Create suitable front end for querying and displaying the results.

PHP and MYSQL

1. Write a program in PHP to connect to a database and retrieve records from a table.
2. Write a program in PHP to connect to a database and insert records into the table.
3. Write a program in PHP to connect to a database and update records in the table.
4. Write a program in PHP to connect to a database and delete records from the table.

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Semester	Code	Title of the Course				Hours	Credits				
V	20UCA5CP5	PHP AND MYSQL LAB				4	3				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓			
CO2	✓			✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓		✓	✓	✓	✓		✓	✓	
CO4	✓	✓	✓	✓			✓	✓		✓	
CO5	✓	✓		✓	✓	✓	✓	✓	✓		
Number of Matches (✓) = 38, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code : 20UCA5MBE1:1
Instruction Hours : 5
Credit : 5

Exam Hours : 03
External Marks: 75
Internal Marks: 25

MAJOR BASED ELECTIVE 1 PHP SCRIPTING LANGUAGES

Course Outcomes

- Write PHP scripts to handle HTML forms.
- Write regular expressions including modifiers, operators, and metacharacters.
- Create PHP programs that use various PHP library functions, and that manipulate files and directories.
- Analyze and solve various database tasks using the PHP language.
- Analyze and solve common Web application tasks by writing PHP programs.

UNIT I:

Essentials of PHP : creating development environment – comments in php variables - Operators and Flow Control: Unary operators – Binary operators – control statements – loop control structures - Strings and Arrays.

UNIT II:

Creating Functions: creating functions in php – passing data to function – default argument – returning array from functions – php variable functions - Reading Data in Web Pages: Text field – Text Area – Radio button – Image map – submit button - PHP Browser - Handling Power: php server variables – validation.

UNIT III:

Object-Oriented Programming: class – objects - Access Specifiers – constructor and destructor – Inheritance - overloading and overriding – Autoloading - Advanced Object-Oriented Programming: static members and methods – Abstract classes – Interfaces – class constants – cloning objects – Reflection.

UNIT IV:

File Handling: Opening Files – feof(), fgets(), fclose(), fgetc(), file_get_contents() - Reading a file into an array with file() – file_exists() - filesize(), fread(), fscanf(), parse_ini_file(), stat(), fseek(), copy(), fwrite(), file_put_contents() – locking files – Working with Databases: Creating MySQL Database – Inserting data into database – Accessing the database in PHP – Reading the table – Displaying the table data, Updating, deleting the database – Sorting table data- Sessions, Cookies, and FTP.

UNIT V:

Ajax : Introduction – AJAX with some PHP – Passing data to the server with GET - Passing data to the server with POST – Handling XML - Handling XML with PHP – Advanced Ajax – Drawing Images on the Server.

Text Book:

1. The PHP Complete Reference, Steven Holzner, McGraw Hill Education, 1st Edition, 2007

Reference Books:

1. PHP: A Beginner's Guide, Vikram Vaswani, McGraw Hill Education, 2nd Reprint, 2008.
2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL: Create -Modify –Reuse", Wiley India Private Limited, Reprint 2008.
3. Matt Doyle, "Beginning PHP 5.3", 2nd Edition, Wiley Publishing Inc., 2009

Semester	Code	Title of the Course				Hours	Credits				
V	20UCA5MBE1:1	PHP SCRIPTING LANGUAGES				5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓		✓	
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓			✓		✓	✓		✓	
CO5	✓	✓		✓	✓	✓	✓	✓	✓	✓	
Number of Matches (✓) = 40, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code: 20UCA5MBE1:2

Instruction Hours : 5

Credit : 5

Exam Hours :03

External Marks: 75

Internal Marks: 25

MAJOR BASED ELECTIVE 1 COMPUTER GRAPHICS

Course Outcomes

- Can understand the display devices
- Can understand line Drawing Algorithms
- Can understand 2D Transformations
- Can understand Composite Transformations
- Can understand 3D transformation

UNIT I:

Overview of Graphics System: Computer Art – Entertainment – Education & Training. **Display Devices:** Cathode Ray - Raster Scan - Random Scan. Input devices – Output Devices – Graphics Software.

UNIT II:

Output Primitives: Points and Lines. **Line Drawing Algorithms:** DDA Algorithm – Bresenham's Line Drawing Algorithms. **Attributes:** Line Attributes – Character Attributes – Area Fill Attributes.

UNIT III:

2D Transformations: Basic Transformations – Translation, Rotation, and Scaling – Matrix Representations.

UNIT IV:

Composite Transformations: Translations, Rotation, Scaling, General Pivot-Point Rotation, General Fixed-Point Scaling. **Other Transformations:** Reflection, Shear.

UNIT V:

3D Transformations: Basic Transformations – Projections: Parallel and Perspective Projections.

Text Book:

1. Donald Hearn and M. Pauline Baker, Computer Graphics, Prentice Hall of India, 2nd Edition, Reprint 2007.

Reference Book:

1. William M. Newman and Robert F. Sproull, Principles of Interactive Computer Graphics, TMH, Second Edition, Reprint 2010.
2. Donald Hearn M. Pauline Baker, "Computer Graphics - C Version", 2nd Edition, Pearson Education, 2006
3. Donald Hearn and M. Pauline Baker, Computer Graphics with OpenGL, Second Edition, Prentice Hall, 2001.

Semester	Code	Title of the Course					Hours	Credits				
V	20UCA5MBE1:2	COMPUTER GRAPHICS					5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓		✓	✓	✓	✓	✓		✓		
CO2	✓	✓		✓	✓	✓	✓		✓			
CO3	✓	✓	✓		✓	✓		✓	✓	✓		
CO4	✓	✓		✓	✓	✓	✓					
CO5	✓	✓		✓	✓	✓	✓	✓		✓		
Number of Matches (✓) = 37, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code : 20UCA5MBE1:3
Instruction Hours: 5
Credit: 5

Exam Hours : 03

External Marks: 75

Internal Marks: 25

MAJOR BASED ELECTIVE 1
DOT NET

Course Outcomes

- Can understand Dot Net Objects
- Can understand ActiveX controls
- Can understand Data Access in Dot Net
- Can understand Events , Delegates and threads
- Can understand Dot Net Remoting and Reflection

UNIT I :Introduction: Dot net Framework-What the Heck in .NET any way? **Dot Net Objects-** .Net namespaces-Assemblies-Object oriented programming features-.Net Memory management-Interoperation with COM-Transaction in .Net-Structured Exception Handling-Code Access Security.

UNIT II:Dot Net Web Service – Writing an XML web services-Self description of XML Web Services The WSDL File- Writing XML Web Service Clients-XML Web service support in Visual studio .Net-XML Web service Design considerations- XML Web Service Security- XML Web Service Enhancements.**Windows Forms** – controls and Events – Hosting ActiveX controls in Windows forms-Form enhancements.

UNIT III:Data Access in Dot Net – disconnected operation- Visual Studio Support and Typed dataset objects. – **Handling XML-** Basic Serialization – Controlling Serialization – XML Schema Serialization – Generic Parsing.

UNIT IV

Events and Delegates- simplest Example- More complex Example- Delegates – **Threads-** Using the process Thread Pool-Thread Safety-Managing Your own threads.

UNIT V :Dot Net Remoting- Configuration Files-Activation Types-Life time Management- Hosting and Deployment –Security- Performance – **Dot Net Reflection-** Simplest Example- Enumerating types-Object creation and method Invocation.

Text Book

David S Platt, “Introducing Microsoft .Net”, Prentice Hall of India, New Delhi,2003.

Reference Book

1. David Chappell, Under standing .Net, Addison-Wesley Professional; 2 Edition,2006.
2. PRO C# 2010 and .NET 4 platform by Andrew Troelsen Apress publication, 5th Edition, 2010.
3. Beginning ASP.NET 4: in C# and VB by Imar Spaanjaars Wrox Publication., 1st Edition, 2013.

Semester	Code	Title of the Course					Hours	Credits				
V	20UCA5MBE1:3	DOT NET					5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓		✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓		✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓		✓	✓	✓		✓		✓		
CO5	✓	✓		✓	✓	✓	✓	✓		✓		
Number of Matches (✓) = 38, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code: 20UCA5SBE2

Instruction Hours : 2

Credit : 2

Exam Hours : 03

External Marks: 75

Internal Marks : 25

SKILL BASED ELECTIVE - 2 RUBY ON RAILS

Course Outcomes

- Make students to gain a broad perspective about the uses of numbers, strings, variables and operators
- Employ loops, methods, blocks, if and cases to create Ruby programs.
- Explain object-oriented programming and input/output processing and apply these concepts to develop dynamic interactive Ruby applications.
- Discuss Model-View-Controller architecture and its relationship to Ruby on Rails applications.
- Use SQL commands and the MySQL database together with Ruby.
- Create an advanced project using MySQL, Ruby and the Ruby on Rails framework

UNIT I:Welcome to Ruby: Creating a First Web Application-Getting started with Ruby- Checking the Ruby Documentation-Working with Numbers in Ruby-Working with Strings in Ruby-Storing Data in Variables-Creating Constants-Interpolating Variables in Double Quoted Strings-Reading Text on the Command Line-Creating Symbols in Ruby-Working with Operators-Handling Operator Precedence.

UNIT II:Conditionals, Loops, Methods and Blocks: Its All about Making choices: the if Statement-Using the case Statement-Using Loops-Creating and Calling a Method.

UNIT III:Classes and Objects: All about Encapsulation-Creating a Class-Creating an Object- Basing one Class on Another-Understanding Ruby's Object Access-Overriding Methods-Creating Class Variables-Creating Class Methods.

UNIT IV:Welcome to Rails: Putting Ruby on Rails-Introducing Model View Controller Architecture-Giving the view Something to do-Mixing Ruby Code and HTML inside the View-Passing Data from an Action to a View-Escaping Sensitive Text-Adding a Second Action.

UNIT V:Connecting to Databases: Creating a Data-Aware Rails Application-Creating a Database-Running the store Application-Adding Another Record-Beautifulizing a Display-Working with Databases: Displaying items to the customer-Creating a Shopping Cart.

Text Book:

1. Beginning Ruby on Rails by Stephen Holzner, Wiley India Publications, Reprint 2007.

Reference Book:

1. Ruby on Rails: Up and Running by Bruce A. Tate, Curt Hibbs, O'Reilly Media Publications, 1st Edition, 2006.
2. The Book of Ruby, Huw Collingbourne, No Starch Press Publications, 1st Edition 2011.
3. Carlson, Leonard Richardson, "Ruby Cookbook", O'Reilly Media, 2nd Edition, 2006.

Semester	Code	Title of the Course					Hours	Credits				
V	20UCA5SBE2	RUBY ON RAILS					2	2				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CO3	✓	✓			✓	✓	✓		✓			
CO4	✓			✓	✓	✓		✓		✓		
CO5	✓	✓	✓	✓	✓	✓		✓		✓		
Number of Matches (✓) = 39, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER V

Course Code: 20UCA5SBE3

Instruction Hours : 2

Credit: 2

Exam Hours : 03

External Marks: 75

Internal Marks: 25

SKILL BASED ELECTIVE 3 - WEB SERVICES

Course Outcomes

- Learning of Basic Steps of implementing web services.
- Understand the principles of SOA
- Efficiently use market leading environment tools to create and consume web services
- Identify and select the appropriate framework components in creation of webservice solution
- XML-based protocol having the main benefit of implementing the SOAP Web Service as its security.
- Learning UDDI is a specification for a distributed registry of web services.

UNIT I:

Introduction: Services-Web Services - Web Services Application Opportunities- Emergence of Web Service: Server-side Architecture Progression-Client-Side Architecture Progression-Service Oriented Architecture and Web Services.

UNIT II:

Web Services Application Scenario: Web Services Hype and the Industry-Web Services and the Industry Acceptance-Extensible Markup Language: History of Markup Languages-What is XML?.

UNIT III:

Validation of XML Data-Advanced XML-Document Constraining-Simple Object Access Protocol: Background-What is SOAP? - SOAP Interaction-SOAP Modeling - SOAP Encoding-SOAP Binding.

UNIT IV:

Web Services Description Language: What is WSDL-Web Service Invocation and WSDL-Web Services Description Details-Service Description through WSDL Registries: Universal Description, Discovery and Integration: What is UDDI-UDDI Nomenclature.

UNIT V:

Core UDDI-Service Publication-Service Discovery-Remote Procedure Call and Messaging: Synchronous Web Services-Asynchronous Web Services - Remote Procedure Call or Messaging.

Text Book

1. Web Services: An Introduction by B.V. Kumar and S.V. Subramanian, Tata McGraw Hill Publications, 5th Edition, 2008.

Reference Books

1. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2nd Edition, 2004.
2. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 5th Edition, 2007.
3. Robert. W.Sebesta, "Programming the World Wide Web", Pearson Education, Fourth Edition, 2007.

Semester	Code	Title of the Course					Hours	Credits			
V	20UC5SBE3	WEB SERVICES					5	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓			
CO2	✓	✓		✓		✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓		✓	✓	✓				✓	
CO5	✓	✓		✓	✓	✓	✓	✓			
Number of Matches (✓) = 37, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – V

Course Code: 20UCA5SBE2

Instruction Hours : 2

Credit : 2

Exam Hours : 03

External Marks: 75

Internal Marks : 25

SOFT SKILLS DEVELOPMENT

Course Objectives

- Today's world is all about relationship, communication and presenting oneself, one's ideas and the company in the most positive and impactful way.
- This course intends to enable students to achieve excellence in both personal and professional life.

Unit I

Know Thyself/ Understanding Self

Introduction to Soft skills-Self discovery-Developing positive attitude-Improving perceptions-Forming values

Unit II

Interpersonal Skills/ Understanding Others

Developing interpersonal relationship-Team building-group dynamics-Net working-Improved work relationship

Unit III

Communication Skills / Communication with others

Art of listening-Art of reading-Art of speaking-Art of writing-Art of writing e-mails-e mail etiquette

Unit IV

Corporate Skills / Working with Others

Developing body language-Practicing etiquette and mannerism-Time management-Stress management

Unit V

Selling Self / Job Hunting

Writing resume/cv-interview skills-Group discussion- Mock interview-Mock GD – Goal setting - Career planning

Text books

1. Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R. Publishers & Distributors, No, B-20 & 21, V.M.M. Complex, Chatiram Bus Stand, Tiruchirappalli- 620 002. (Phone No: 0431-2702824: Mobile No: 94433 70597, 98430 74472)
2. Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055. Mobile No : 94425 14814 (Dr.K.Alex)

Reference books

- (i) Developing the leader within you John c Maxwell
- (ii) Good to Great by *Jim Collins*
- (iii) The seven habits of highly effective people Stephen Covey
- (iv) Emotional Intelligence Daniel Goleman
- (v) You can win Shive Khera
- (vi) Principle centred leadership Stephen Covey

Prepared By

Checked By

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SEMESTER - VI

(For the candidates admitted from the academic year 2020-2021 onwards)

SEMESTER – VI

Course Code : 20UCA6CC8
Instruction Hours : 6
Credit : 6

Exam Hours :03
External Marks: 75
Internal Marks: 25

CORE COURSE VIII OPERATING SYSTEMS

Course Outcomes

- Describe the important computer system resources and the role of operating system in their management policies
- Describe and analyze the memory management and its allocation policies
- Understand the process scheduling and process synchronization by operating system
- Identify use and evaluate the storage management policies with respect to different storage management technologies.
- Understand different file systems for management of information.

UNIT I:

Introduction – Importance of Operating System – Basic concepts and Terminology – An OS Resource Manager – Process Viewpoint – Hierarchical View and Extended Machine View – Other views of OS - I/O Programming – Interrupt Programming – Machine Structure.

UNIT II:

Memory Management: Single Contiguous Allocation – Partitioned Allocation – Relocatable Partitioned Memory Management – Paged Memory Management- Demand Paged Memory Management – Segmented Memory Management -Segmented and Demand paged Memory Management – overlay Techniques – Swapping.

UNIT III:

Processor Management:State Model – Job Scheduling – Process Scheduling – Functions and Policies – Evolution of Round Robin Multiprogramming Performance – Process Synchronization – Wait and Signal mechanisms – Semaphores P & V Operations – Deadlock – Banker’s Algorithm.

UNIT IV:

Device Management: Techniques for Device Management – Device Characteristics – Hardware Considerations – Channels and Control Units – I/O Traffic Controller – I/O Scheduler – I/O Device Handler –Spooling.

UNIT V:

Information Management:Simple File System – General Model of File System – Symbolic File System – Basic File System – Logical File System – Physical File System. **Case Studies:** MSDOS, UNIX.

Text Book

Stuart E.Madnick, John J. Donovan “Operating Systems” McGraw-Hill International Edition, 18th Reprint, 2008.

Reference Books

1. A.Silberschatz P.B.Galvin,Gange., “Operating System Principles”, 7th Edition, John Wiley & Sons., 2006.
2. Harvey M. Deitel, “Operating Systems”, Pearson Education Pvt. Ltd, Second Edition, 2002.
3. William Stallings, “Operating System”, Pearson Education, Sixth edition, 2012.

Semester	Code	Title of the Course					Hours	Credits			
VI	20UCA6CC8	OPERATING SYSTEM					6	6			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓		✓	
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓		✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓		✓	✓	✓	✓		✓	
CO5	✓	✓	✓	✓	✓	✓		✓		✓	
Number of Matches (✓) = 40, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – VI

Course Code : 20UCA6CC9
Instruction Hours : 6
Credit : 6

Exam Hours :03
External Marks: 75
Internal Marks: 25

CORE COURSE VIII SMART DEVICE PROGRAMMING

Course Outcomes

- Understand and explain the history of Android OS and its building blocks.
- Discuss android user interface and other UI events.
- Building the skills of creating database and perform operations on it.
- Identifying the uses of broadcast receivers and content providers.
- Familiarity with system services and android interface definition language.

UNIT I:

Android Overview-Android Overview-History-Android Versions **The Stack** -Stack Overview-Linux-Native Libraries-Dalvik -Application Framework-Applications **Quick Start** -Installing the Android SDK -Hello, World -The Emulator **Main Building Blocks** -What Are Main Building Blocks?-A Real-World Example-Activities- Intents –Services -Content Providers- Broadcast Receivers- Application Context

UNIT II:

Android User Interface -Two Ways to Create a User Interface -Views and Layouts - Starting the Yamba Project - The StatusActivity Layout -The StatusActivity Java Class -Logging in Android - Threading in Android - Other UI Events- Adding Color and Graphics -Alternative Resources-Optimizing the User Interface -**Preferences, the Filesystem, the Options Menu, and Intents** -Preferences -The Options Menu -Shared Preferences -The Filesystem

UNIT III:

The Database – SQLite DbHelper-First Example- Update UpdaterService -Refactoring Status Data -**Lists and Adapters** -TimelineActivity -Basic TimelineActivity Layout- About Adapters –TimelineAdapter -ViewBinder: A Better Alternative to TimelineAdapter -Updating the Manifest File -Base Activity

UNIT IV:

Broadcast Receivers -About Broadcast Receivers-BootReceiver-The TimelineReceiver -Broadcasting Intents -The Network Receiver -Adding Custom Permissions to Send and Receive Broadcasts - **Content Providers** -Creating a Content Provider -Using Content Providers Through Widgets

UNIT V:

System Services -Compass Demo -Location Service -Updating Yamba to Use the Location Service -Intent Service -Sending Notifications- **The Android Interface Definition Language** -Implementing the Remote Service -Implementing the Remote Client.

Text Book

Learning Android Building Applications - Marko Gargenta, Oriley publications, 1st edition , 2011.

Reference Books

1. Android Application Development – Lauren Darcey et al – Pearson ,1st Edition,2012.
2. Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003.
3. RAJ KAMAL, “Mobile Computing,” second edition, Oxford, 2008

Semester	Code	Title of the Course				Hours	Credits				
VI	20UCA6CC9	SMART DEVICE PROGRAMMING				6	6				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓			
CO2	✓	✓		✓	✓	✓	✓		✓		
CO3	✓	✓		✓		✓	✓		✓	✓	
CO4	✓	✓	✓	✓	✓	✓		✓		✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓		✓	
Number of Matches (✓) = 38 Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – VI

Course Code : 20UCA6CP6
Instruction Hours : 5
Credit : 4

Exam Hours :03
External Marks: 60
Internal Marks: 40

CORE PRACTICALVI SMART DEVICE PROGRAMMING LAB

Course Outcomes

- Understand and explain the android SDK with simple programming.
- Discuss and demonstrate passing of data between activities.
- Building the skills of creating SMS and content provider application
- Identifying the uses of broadcast receivers and content providers.
- Familiarity with concept of services and background threats.

List of Programs

1. Create a simple screen which displays “Hello World”.
2. Create a screen to accept your name, date of birth and display age. The date widget must be used.
3. Demonstrate the passing of data between activities.
4. Display the phone numbers from the phone book using your own application.
5. Create a simple SMS application.
6. Create an Application which deals with the Android Content Providers
7. Create an android application with login page and a home page
8. Create Application using Android Layouts, Views and Events
9. Create Application which uses the concept of Services and Background Threats

Semester	Code	Title of the Course				Hours	Credits				
VI	20UCA6CP6	SMART DEVICE PROGRAMMING LAB				5	4				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓		✓	
CO2	✓	✓				✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CO4	✓	✓		✓	✓	✓	✓				
CO5	✓	✓		✓	✓	✓	✓	✓		✓	
Number of Matches (✓) = 37, Relationship: High											

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – VI

Course Code : 20UCA6MBE2:1
Instruction Hours : 6
Credit : 6

Exam Hours :03
External Marks: 75
Internal Marks: 25

MAJOR BASED ELECTIVE 2 SOFTWARE ENGINEERING

Course Outcomes

- How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment.
- An ability to work in one or more significant application domains.
- Work as an individual and as part of a multidisciplinary team to develop and deliver quality software.
- Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.
- Demonstrate an ability to use the techniques and tools necessary for engineering practice.

UNIT I:

Introduction to Software Engineering – The Evolving Role of Software, Software, The Changing Nature of Software, Legacy Software. **Process Model**- Prescriptive Models, The Waterfall Model, Incremental Process Models, Evolutionary Process Models, The Concurrent Development Model, Specialized Process Models, The Unified Process.

UNIT II:

System Engineering – Computer Based System, The System Engineering Hierarchy, Business Process Engineering: An Overview, Product Engineering: An Overview, System Modeling. **Requirements Engineering** – Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-Cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.

UNIT III:

Building the Analysis Model – Requirements Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Object-Oriented Analysis, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Based Modeling, Creating a Behavioral Model. **Design Engineering** – Design Concepts, the Design Model, Pattern-Based Software Design.

UNIT IV:

Creating an Architectural Design – Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design. **Modeling Component-level Design** – What is a Component, Designing Class-Based Components, Conducting Component-level Design, Object Constraint Languages, Designing Conventional Components.

UNIT V:

Testing Strategies – A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Validation Testing, System Testing, The Art of Debugging. **Testing Tactics** – Software Testing Fundamentals, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing.

Text Book “Software Engineering - A Practitioner’s Approach” – Roger S Pressman, Tata McGraw-Hill Edition, Sixth Edition, 2010.

Reference Book “Software Engineering” – Jibithesh Mishra, Ashok Mohanty, Pearson Education, 2011.

Semester	Code	Title of the Course					Hours	Credits				
VI	20UCA6MBE2:1	SOFTWARE ENGINEERING					6	6				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓	✓	✓	✓	✓	✓	✓		✓	✓		
CO4	✓	✓		✓		✓	✓	✓		✓		
CO5	✓	✓		✓	✓	✓	✓	✓	✓	✓		
Number of Matches (✓) = 40, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – VI

Course Code: 20UCA6MBE2:2

Instruction Hours : 6

Credit : 6

Exam Hours :03

External Marks: 75

Internal Marks: 25

MAJOR BASED ELECTIVE 2 MOBILE COMMUNICATION

Course Outcomes

- Understand the WLAN Technologies
- Can demonstrate various routing protocols
- Can Demonstrate the Enhancements in TCP
- Can Understand the 4G and 5G Technologies

UNIT I: WIRELESS LAN

Introduction-WLAN technologies: Infrared, UHF narrowband, spread spectrum –IEEE 802.11: System architecture, protocol architecture, physical layer, MAC layer, 802.11b, 802.11a – Hiper LAN: WATM, BRAN, HiperLAN2 – Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager protocol, security.

UNIT II: MOBILE NETWORK LAYER

Introduction – Mobile IP: IP packet delivery, Agent discovery, Registration, Tunneling and encapsulation, Optimization, Reverse tunneling, IPV6- Dynamic Host Configuration Protocol– Mobile ad-hoc network: Routing, Destination Sequence distance vector, Dynamic source routing, Alternative metrics, Overview ad-hoc routing protocols.

UNIT III: MOBILE TRANSPORT LAYER

TCP enhancements for wireless protocols – Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility – Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, Transaction oriented TCP – TCP over 3G wireless networks- Support formobility: File system- World Wide Web- Wireless Application Protocol: Architecture, Wireless datagram protocol, wireless transport layer security, wireless transaction protocol, wireless session protocol, wireless application environment, Wireless markup language, WML script, Push architecture

UNIT IV: WIRELESS WIDE AREA NETWORK

Overview of UTMS Terrestrial Radio access network-UMTS Core network Architecture: 3G-MSC, 3G-SGSN, 3G-GGSN, SMS-GMSC/SMS-IWMSC, Firewall, DNS/DHCP, QOS in UMTS-High speed Downlink packet access (HSDPA) – Wide Area Wireless Network: Introduction, cdma2000 Layering Structure, Forward Link Physical Channels of cdma2000, Forward Link Features.

UNIT V: WLAN, 3G & 4G NETWORKS

Interworking between Wireless Local Area Networks and 3G Wireless Wide Area Networks - Introduction – 4G vision – 4G features and challenges – Applications of 4G – 4G Technologies: Multicarrier Modulation, Smart antenna techniques, OFDM-MIMO systems, Adaptive Modulation and coding with time slot scheduler, Cognitive Radio.

Text Books

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education 2008(Unit I,II,III)
2. Vijay Garg , "Wireless Communications and networking", First Edition, Elsevier 2007.(Unit IV,V)

Reference Books

1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE for Mobile Broadband", Second Edition, Academic Press, 2008.

2. Anurag Kumar, D.Manjunath, Joy kuri, “Wireless Networking”, First Edition, Elsevier 2011.
3. Simon Haykin, Michael Moher, David Koilpillai, “Modern Wireless Communications”, 1st Edition, 2011.

Semester	Code	Title of the Course					Hours	Credits				
VI	20UCA6MBE2:2	MOBILE COMMUNICATION					6	6				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓		✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓	✓		✓	✓	✓	✓	✓	✓	✓		
CO4	✓			✓		✓	✓			✓		
CO5	✓	✓	✓	✓	✓	✓	✓	✓		✓		
Number of Matches (✓) = 39, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – VI

Course Code : 20UCA6MBE2:3

Instruction Hours : 6

Credit : 6

Exam Hours :03

External Marks: 75

Internal Marks: 25

MAJOR BASED ELECTIVE 2 XML PROGRAMMING

Course Outcomes

- Understand the basics of XML
- Can create XML documents using DOM
- Can validate XML document using DTD
- Understand the concepts of Attributes and Schema
- Understand the concepts of Types and Groups

UNIT I:

Getting a Global Perspective: The early beginnings – The Current Standards-XML Software.**Reviewing XML Validating and Non-validating Parsers:** Getting XML Documents Written – XML Non-validating Parsers -Validating Parsers. **Saying “Hello World” in XML:** XML structure, XML elements, writing your first document, passing your document- using layers of elements- commenting your XML code-Datastructure and organization.

UNIT II:

Organizing XML Data: Creating Layers of information from your data – Structuring your data- Ensuring that your data works with the Document Object Model (DOM). **Creating Well-Formed XML:** Document Basics – Creating and Describing Elements – Child Elements. **Adding Attributes:** Using attributes to Enhance Elements – Attribute rules - Using attributes to Enhance empty Elements- Sharing attributes-Using style sheet with attributes.**XML Namespaces:** What are Namespaces?- Using Namespaces within Documents- Adding name space to DTDs.

UNIT III:

Validating your XML Documents: DTDs and validation – Adding DTDs to your Documents – PUBLIC Versus SYSTEM DTDs – declaring Element types –Controlling element content – adding comments. **Defining DTD Entities:** Understanding Entities – Defining General Entities – Defining parameters entities-

UNIT IV:

Working with Attributes: Delving into attributes – attribute or element? – defining attributes- defining multiple attributes – using predefined attributes.**Introducing Schemas:** What are schemas?- Comparing DTDs and schema – Writing a basic schema –What software is available?

UNIT V:

Schema Elements, Types and Groups: Schema element Descriptions – Element Types- Using Groups of elements- Element content.**Defining Schema Attributes:** Schema attributes description –using schema annotations – using constraints- creating unique elements and attributes.**Advanced Concepts with Schema:** Target namespaces and schemas – undeclared target namespaces – schema constraints versus ID attributes- global VS local declarations- using schemas as Multiple documents- Substitution groups- abstract elements and types.

Text Book:

1. Heather Williamson, "XML:The Complete Reference", McGraw-Hill, 1st Edition, 2001.

Reference Books:

1. William R.Stanek , "XML Pocket Consultant", Prentice Hall, 1st Edition, 2002.
2. Sandra E.Eddy& John E.Schnyder "Teach Yourself XML", IDG Books India (P) Ltd, 2nd Edition, 2002.

Semester	Code	Title of the Course					Hours	Credits				
VI	20UCA6MBE2:3	XML PROGRAMMING					6	6				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓		
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓	✓		✓	✓		✓		✓	✓		
CO4	✓	✓		✓	✓	✓		✓	✓			
CO5	✓	✓		✓	✓	✓	✓	✓				
Number of Matches (✓) = 38, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – VI

Course Code: 20UCA6MBE3:1
Instruction Hours : 6
Credit : 6

Exam Hours :03
External Marks: 60
Internal Marks: 40

MAJOR BASED ELECTIVE 3 MINI PROJECT

1. All UG final year students have to carry out their mini project in the college itself.
2. The objective of the mini project is to enable the students to work as group.
3. Each group is limited to maximum of four students.
4. Mini Projects must be implemented using latest technology.

SEMESTER – VI

Course Code: 20UCA6MBE3:2
Instruction Hours : 6
Credit : 6

Exam Hours :03
External Marks: 60
Internal Marks: 40

MAJOR BASED ELECTIVE 3 LINUX LAB

Course Objectives

- To impart practical training in Shell Programming.
- To gain knowledge in Linux commands.
- To familiar with Linux Environment.

Course Outcomes

- Can able to write shell scripts using files
- Can write scripts using menu driven concept
- Can able to write shell script using standard input and perform operation on it
- Can able to execute shell scripts
- Can able to test Linux commands

List of Programs

Write Shell scripts for the following

1. Write a shell program, which accepts the name of a file from the standard input and performs the following tests on it:
 - a. File existence
 - b. File readable
 - c. File writeable
 - d. Both readable and writeable
2. Write a shell program using 3 arguments to take the pattern as well as input and output file names. If the pattern is found display “Pattern found” else display “Error message”. Also check if right number of arguments is entered.
3. Write a shell program, which accepts the name of the file from the standard input and then performs the following tests on it:
 - a. Enter the 5 names in a file
 - b. Sort the names in existing file
 - c. List unsorted and sorted file
 - d. Quit
4. Write a menu driven shell program to copy, edit, rename, and delete a file.
5. Write a menu driven shell program to perform the following tasks
 - a. Enter the sentence in file
 - b. Search a given whole word in an existing file
 - c. Quit
6. Write a shell script to display the result “PASS” or “FAIL” using the information given below: Student Name, Student Register Number, Mark1, Mark2, Mark3 and Mark4. The minimum pass for each subject is 50.
7. Write a menu driven shell script for converting all the capital letters in a file to small case letters and vice versa.
8. Write a shell script to merge the contents of three given files, sort them and display the sorted output on the screen page by page.
9. Write a shell script to check whether a given string is Palindrome or not.

Semester	Code	Title of the Course					Hours	Credits				
VI	20UCA6MBE3:2	LINUX LAB					5	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓		✓	✓	✓	✓	✓		✓		
CO2	✓	✓		✓	✓	✓	✓	✓	✓			
CO3	✓	✓		✓	✓	✓	✓	✓	✓	✓		
CO4	✓	✓	✓	✓			✓	✓	✓	✓		
CO5	✓			✓	✓	✓	✓			✓		
Number of Matches (✓) = 39, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

SEMESTER – VI

Course Code: 20UCA6MBE3:3

Exam Hours :03

Instruction Hours : 6

External Marks: 60

Credit : 6

Internal Marks: 40

MAJOR BASED ELECTIVE 3

DOT NET LAB

Course Objectives

- To impart practical training in DOT NET Programming Language.
- To make the student to be familiar with database operations from dotnet.
- To develop knowledge in various components in dotnet.

Course Outcomes

- Can able to design ASP.Net web form using Html Server Controls
- Can able to write programs using validation controls
- Can Create a web application using ADO.Net
- Can Create an application using Data grid control
- Can Create an application using Data list control

List of Programs

1. Design ASP.Net web form using Html Server Controls to enter job seeker's details.
2. Create an ASP.Net web form using Web control to enter E-Mail registration form.
3. Apply appropriate validation techniques in E-Mail registration form using validation controls.
4. Write an ASP.Net application to retrieve form data and display it the client browser in a table format.
5. Create a web application using ADO.Net that uses which performs basic data manipulations:
(i). Insertion (ii) Updating (iii) Deletion (iv) Selection
Hint: Do operations using MS-Access and SQL-Server
6. Create an application using Data grid control to access information's from table in Ms.Access.
7. Create an application using Data list control to access information's from table in Ms.Access and display the result in neat format.

Case Studies (Must include basic database operations such as Insertion, Deletion, Modification, Selection and Searching)

1. Job Search Portal.
2. College Portal.
3. Company Portal.

Semester	Code	Title of the Course					Hours	Credits				
VI	20UCA6MBE3:3	DOT NET LAB					6	6				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓	✓	✓	✓	✓				
CO2	✓	✓		✓	✓	✓		✓	✓			
CO3	✓	✓		✓	✓		✓	✓	✓	✓		
CO4	✓	✓		✓	✓	✓	✓			✓		
CO5	✓	✓			✓		✓	✓	✓	✓		
Number of Matches (✓) = 38, Relationship: High												

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High