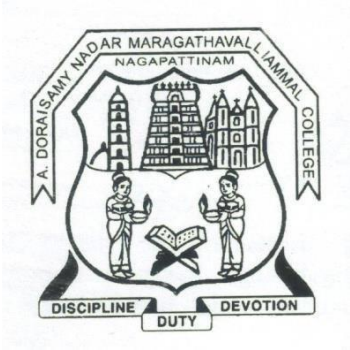
A.D.M COLLEGE FOR WOMEN (AUTONOMOUS),

(Accredited With 'A' Grade by NAAC 4th Cycle)

(Affiliated to Bharathidasan University, Tiruchirappalli)

NAGAPATTINAM-611 001

PG DEPARTMENT OF COMPUTER SCIENCE



SYLLABUS

B.Sc., INFORMATION TECHNOLOGY

Batch (2024-2027)

A.D.M. COLLEGE FOR WOMEN (AUTONOMOUS), NAGAPATTINAM

UG Programme - B.Sc., Information Technology
(For the candidates admitted from 2024 – 2027 onwards)

Bloom's Taxonomy Based Assessment Pattern

Knowledge Level

K1 – Acquire/Remember	**K2** – Understanding	**K3** – Apply	**K4** – Analyze	**K5** – Evaluate	**K6** – Create

1. Part I, II and III

Theory (External + Internal = 75 + 25 = 100 marks)

External/Internal					
Knowledge Level	**Section**	**Marks**	**Hrs.**	**Total**	**Passing Mark**
K1-K3	A (Answer all)	10 ×2 = 20	3	75	38
K3-K6	B (Either or pattern)	5 × 5 = 25			
K3-K6	C (Answer 3 out of 5)	3 × 10 = 30			
PRACTICAL (External + Internal = 60 + 40 = 100 marks)			3	60	24
K1-K6	Answer all Questions	2 ×25=50 Record =10			

PG DEPARTMENT OF COMPUTER SCIENCE
B.Sc INFORMATION TECHNOLOGY COURSE STRUCTURE
UNDER CBCS(2024-2027 Batch)

OBE ELEMENTS

Programme Educational Objectives (PEO):

PEO 1:	To impart knowledge in advanced concepts and applications in different fields of computer Science.
PEO 2:	To prepare students to enter into professional courses.
PEO 3:	To educate students to occupy important positions in Software's, MNC's and Industries.
PEO 4:	To equip students with skills to excel in their future careers.
PEO 5:	To enable students to take up challenging jobs.

Programme Outcomes (PO):

On completion of the course the learner will be able

PO 1:	Under Graduate students are to Apply algorithmic, mathematical and scientific reasoning to a variety of computational problems
PO 2:	Undergraduate students to analyze impacts of computing on individuals organization and society.
PO 3:	Undergraduate students are recognition of the need for and ability to engage in continuing professional development.
PO 4:	Undergraduate students are to be exposed to technical, analytical and creative.
PO 5:	The Under Graduate students are recognize the social and ethical responsibilities of a professional working in the various disciplines

Programme Specific Outcomes (PSO):

On completion of the course the learner will be able

PSO 1:	To acquire knowledge with fundamentals of computer science to solve complex problems related to the field of Computer science
PSO 2:	Ability to identify, formulate and analyze complex problems related to computer science and reaching a substantiated conclusions using mathematics and its applications
PSO 3:	Ability to understand professional & ethical responsibility in the field of Computer Science.
PSO 4:	Understand the impact of the Computer professionals in societal and environmental contexts.
PSO 5:	Capability to use appropriate software for analysis of data and relevant information from various sources for easy access and evaluation in variety of learning situation.

ADM COLLEGE FOR WOMEN (AUTONOMOUS), NAGAPATTINAM
PG DEPARTMENT OF COMPUTER SCIENCE
CURRICULUM STRUCTURE -B.Sc. INFORMATION TECHNOLOGY
(For I Year 2024 Batch onwards)

Part	Category of Courses	No. of Courses	Hrs	Total Credits
Part I	**Language Courses (Tamil/Hindi/French/Arabic/ Sanskrit)**	**4**	**24**	**12**
Part II	**English Language Courses**	**4**	**24**	**12**
Part III	**Core Courses (CC) (T – 10, P – 5)**	**15**	**70**	**60**
	Minor Course (T – 4 / 5 , P – 2/1)	**6**	**24**	**16**
	Discipline Specific Courses (DSC)	**3**	**10**	**9**
	Project	**1**	**3**	**3**
Part IV	**Skill Enhancement Courses (SEC)**	**4**	**8**	**8**
	Ability Enhancement Courses (AEC)	**3**	**6**	**6**
	Multi Disciplinary Courses (NME)	**2**	**4**	**4**
	Environmental Studies	**1**	**2**	**2**
	Value Education	**1**	**2**	**2**
	Soft Skill Development	**1**	**2**	**2**
	Summer Internship/Industrial Activity	**0**	**0**	**2**
Part V	**Gender Studies**	**1**	**1**	**1**
	Extension Activity (NCC/NSS/Sports/Any Other Activities)	**0**	**0**	**1**
	Total	**46**	**180**	**140**

EXTRA CREDIT SCHEME STRUCTURE – 2024 – 2027

Courses	Credits	Semester	Marks
xtra Credit Courses I(Professional English) ECPEA - ECC I - PROFESSIONAL ENGLISH FOR ARTS AND SOCIAL SCIENCES **(Tamil, English, History, Economics, Mathematics, CS, IT, BCA)** ECPEB - ECC I - PROFESSIONAL ENGLISH FOR COMMERCE AND MANAGEMENT **(Commerce & BBA)** ECPEC - ECC I - PROFESSIONAL ENGLISH FOR LIFE SCIENCES **(Zoology, Botany, Biochemistry & Marine)** ECPED - ECC I - PROFESSIONAL ENGLISH FOR PHYSICAL SCIENCES **(Physics, Chemistry & Geology)**	2	I	100
Extra Credit Courses II (Skill Course I – Add on)	2	II	100
Extra Credit Courses III(Skill Course II- Add on)	2	III	100
Extra Credit Courses IV(Skill Course III- Add on)	2	IV	100
Value added course I (Multidisciplinary)	2	V	100
Value added Course II (Same disciplinary)	2	VI	100
Total	**12**		

B.Sc., Information Technology
2024- 2027 Batch
SCHEME OF THE PROGRAMME

SEMESTER – I							
PART	**COURSE TYPE**	**COURSES**	**HOURS**	**CREDITS**	**EXAM DURATION**	**MAX. MARKS**	
						CIA	**EXT**
Part I	Language Course I	LC I-Pothu Tamil I	6	3	3	25	75
Part II	English Course I	ELC I - General English I	6	3	3	25	75
Part III	Core Course I	CC I - C Programming	5	4	3	25	75
	Core Practical I	CP I- C Programming Lab	3	3	3	40	60
	First Minor Course I	FMC I - Mathematics I	4	3	3	25	75
	First Minor Course II	FMC II - Mathematics II	2	-	-	-	-
Part IV	Skill Enhancement Course I	SEC I - Fundamentals of Information Technology	2	2	3	25	75
	VE	Value Education	2	2	3	25	75
*Extra Credit1	Extra Credit I	Extra Credit Course I – ProfessionalEnglish		2	-	0	100
		No.of Courses	**30**	**20+2**			
SEMESTER – II							
PART	**COURSE TYPE**	**COURSES**	**HOURS**	**CREDITS**	**EXAM DURATION**	**MAX. MARKS**	
						CIA	**EXT**
Part I	Language Course II	LC II - Pothu Tamil II	6	3	3	25	75
Part II	English Course II	ELC II - General English II	6	3	3	25	75
Part III	Core Course II	CC II-Data Structures using C++	5	4	3	25	75
	Core Practical II	CP II- Data Structures using C++ Lab	3	3	3	40	60
	First Minor Course II	FMC II - Mathematics II	2	2	3	25	75
	First Minor Course III	FMC III -Mathematics III	4	3	3	25	75
Part IV	Skill Enhancement Course II	Computational Skills & Internet Lab	2	2	3	40	60
	EVS	Environmental Studies	2	2	3	25	75
*Extra Credit II	Extra Credit II	Extra Credit Courses II (Skill Course I – Add on) **Data Entry Operator with DTP**		2	-	0	100
		No.of Courses	**30**	**22+2**	-	-	-

SEMESTER – III							
PART	**COURSE TYPE**	**COURSES**	**HOURS**	**CREDITS**	**EXAM DURATION**	**MAX. MARKS**	
						CIA	**EXT**
Part I	Language Course III	LC III - Pothu Tamil III	6	3	3	25	75
Part II	English Course III	ELC III - General English III	6	3	3	25	75
Part III	Core Course III	CC III - Web Technology	5	4	3	25	75
	Core Practical III	CP III - Web Technology Lab	3	2	3	40	60
	Second Minor Course I	SMC I- Digital Electronics	4	3	3	25	75
	Second Minor Practical I	SMP I - Digital Electronics Lab	2	-	-	-	-
Part IV	Multi Disciplinary Course I	**NME I** **1. DTP Lab** **2.** Web Designing Lab	2	2	3	40	60
	Skill Enhancement Course III	SEC III - PHP Lab	2	2	3	40	60
*Extra Credit III	Extra Credit III	Extra Credit Courses III (Skill Course II- Add on)		2	-	0	100
		No.of Courses	**30**	**19+2**	-	-	-

SEMESTER – IV							
PART	**COURSE TYPE**	**COURSES**	**HOURS**	**CREDITS**	**EXAM DURATION**	**MAX. MARKS**	
						CIA	**EXT**
Part I	Language Course IV	LC IV- Pothu Tamil IV	6	3	3	25	75
Part II	English Course IV	ELC IV - General English IV	6	3	3	25	75
Part III	Core Course IV	CC IV-Java Programming	5	4	3	25	75
	Core Practical IV	CP IV-Java Programming Lab	3	3	3	40	60
	Second Minor Practical I	SMP I - Digital Electronics Lab	2	2	3	40	60
	Second Minor Course III	SMC II - Microprocessor and Microcontroller	4	3	3	25	75
Part IV	Multi Disciplinary Course II	**NME II** **1. Animation Lab** 2. HTML and CSS Lab	2	2	3	40	60
	Ability Enhancement Course -I	AEC I - GIMP Lab	2	2	3	40	60
*Extra Credit IV	Extra Credit IV	Extra Credit Courses IV (Skill Course III- Add on) Computer Literacy Lab		2	-	0	100
		No.of Courses	**30**	**22+2**	-	-	-

SEMESTER – V							
PART	**COURSE TYPE**	**COURSES**	**HOURS**	**CREDITS**	**EXAM DURATION**	**MAX. MARKS**	
						CIA	**EXT**
Part III	Core Course V	CC V-Python Programming	6	5	3	25	75
	Core Course VI	CC VI-Computer Networks	6	5	3	25	75
	Core Course VII	CC VII-Advanced Database Management System	6	5	3	25	75
	Core Practical V	CP V –Advanced Database Management System Lab	5	4	3	40	60
	Discipline Specific Elective –I	**DSE I -** **1.Artificial Intelligence and Expert System** **2.** Markup and Scripting Languages	3	3	3	25	75
Part IV	Ability Enhancement Course -II	AEC II - Python Programming Lab	2	2	3	40	60
	SSD	Soft Skill Development	2	2	3	25	75
	Summer Internship/ Ind. Training	Internship	-	2	-	-	-
*Extra Credit V	Extra Credit Courses V	Value Added Course I (Multidisciplinary) **Web Graphics (Theory and Practical)**		2	-	0	100
		No.of Courses	**30**	**28 +2**			

SEMESTER – VI							
PART	**COURSE TYPE**	**COURSES**	**HOURS**	**CREDITS**	**EXAM DURATION**	**MAX. MARKS**	
						CIA	**EXT**
Part III	Core Course VIII	CC VIII - DOTNet Programming	5	5	3	25	75
	Core Course IX	CC IX - Operating Systems	5	5	3	25	75
	Core Course X	CC X- Computer Graphics	5	4	3	25	75
	Core Course XI	CC XI - Project	3	3	3	40	60
	Discipline Specific Elective –II	DSE II **1.E-Commerce** 2.Network Security	3	3	3	25	75
	Discipline Specific Elective –III	DSE III **1. Dotnet Programming Lab** 2. Latex Lab	4	3	3	40	60
Part IV	Skill Enhancement Course IV	SEC IV- Linux Lab	2	2	3	40	60
	Ability Enhancement Course -III	AEC III - Computer Graphics and Animation Lab	2	2	3	40	60
Part V	GS	Gender Studies	1	1	3	25	75
	Extension Activity	(NCC/NSS/Sports/Any Other Activities)	-	1	-	-	-
*Extra Credit VI	Extra Credit Course VI	Value added Course II (Same disciplinary) **Full Stack Development**		2	-	0	100
		No.of Courses	**30**	**29+2**	-	-	-

Semester-I / Core Course-I (CC I)	**C Programming**	**Course Code:**
Instruction Hours: 5	**Credits: 4**	**Exam Hours: 3**
Internal Marks:25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To obtain knowledge about the structure of the programming language C
- To develop the program writing and logical thinking skill**.**
- To impart the knowledge about pointers which is the backbone of effective memory handling
- To study the advantages of user defined data type which provides flexibility for application development
- To teach the basics of Preprocessors available with C compiler

UNIT	CONTENT	HOURS
UNIT I	FUNDAMENTALS OF PROGRAMMING: Computer Basics- Algorithms – Simple Model of a Computer – Characteristics of Computers- Problem Solving Using Computers – Flow Chart – The Working of a Computer. Introduction To C Language: Identifiers, Keywords, Constants, Variables and data types, Access Modifiers, Data Type Conversions- Operators- Conditional Controls – Loop.	15
UNIT II	ARRAYS: One Dimensional Array - Two Dimensional Array – Character Arrays and Strings. FUNCTION: Introduction - Elements of User Defined Function - Definition of Functions - Return Values and their Types – Function Calls - Function Declaration - Category of Function - Nesting of Function - Recursion - Passing Arrays to Function - Passing Strings to Function – The Scope, Visibility and Lifetime of Variables - Library functions.	15
UNIT III	STRUCTURES AND UNIONS: Defining Structure - Declaring Structure Variable - Accessing Structure Members Structure Initialization - Arrays of Structure - Arrays within Structures - Structures within Structures - Structures and Function - Union.	15
UNIT IV	POINTERS : Pointers - Declaration of Pointers - Accessing Variables through Pointers - Chain of Pointers - Pointer Expressions- Pointer Increments - Pointers with Arrays, Strings- Array of Pointers - Pointers with Functions - Pointers with Structures.	15
UNIT V	FILE MANAGEMENT IN C : Defining and Opening a File - Closing a File - Input / Output Operations on Files – Error Handling During I/O Operations - Random Access to Files - Command Line Arguments - Dynamic Memory Allocation.	15

Text Books:

1. V. Rajaraman, "Fundamentals of Computer ",Asoke k.Ghosh Publications, PHI Course Limited, 6th Ed.,New Delhi,2011. UNIT I(A)
2. E. Balagurusamy, "Programming in C", Tata McGraw Hill, 8th Ed., New Delhi, 2016. UNIT I (B) to UNIT V.

Reference Books:

1. Byron S. Gottfried, "Programming with C", Tata McGraw Hill, 3rd Ed., New Delhi, 2010.
2. Yashvant Kanetkar, "Working with C", BPB Publication, 2nd revised edition,New Delhi, 2008.

Web-Resources:

https://www.w3schools.in/c-tutorial/ https://nptel.ac.in/courses/106104128/

Course Outcomes:

On completion of the Course, learner should be able to,

- Understand the basic terminology of algorithm, flowchart and gain awareness used in computer programming.
- Design programs involving the various concepts like decision structures, loops, functions of Clanguage.
- Demonstrate the single, multi-dimensional arrays, Underatand the String functions and user defined functions.
- Compare the structure and union of C and apply it to construct array of structures and structure function.
- Understand the dynamics of memory by the use of pointers and pointers with functions

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	M	S	S	S	S	S	S	S	S	S
CO3	S	S	M	S	S	S	S	S	M	S
CO4	S	S	S	S	M	S	M	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-I / Core Practical – I(CP I)	**C Programming Lab**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire/ Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To develop skills in implementing algorithms through the programming Language C
- To explore the features of C by applying sample problems.
- The students will be able to enhance their analyzing and problem solving skills
- To learn problem solving techniques.
- To teach the student to write programs in C and to solve the problems.

List of Practicals:

1. Exercise using different data types
2. Exercise using different operators
3. Exercise to implement control structures
4. Exercise using loop statements
5. Exercise using arrays
6. Exercise to explore built-in functions
7. Exercise to create user defined function
8. Exercise using structures
9. Exercise using pointers
10. Exercise to work with files

Course Outcomes

On completion of the course the learner will be able to

- Understanding a functional hierarchical code organization.
- Ability to define and manage data based on problem subject domain.
- Ability to work with textual information, characters and strings.
- Ability to work with arrays of complex objects.
- Understanding a concept within the framework of functional model.

Semester-I / Skill Enhancement Course I (SEC I)	**Fundamentals of Information Technology**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To understand the basics of computer system, its architecture, database and Networks.
- To understand the basic concepts, terminology of IT and familiar with the use of IT tools.
- To Learn and explore new IT techniques in various applications and to identify the issues related to security.
- Gain insight into the IT trends and the future of technologies.
- Install technical hardware and software including network, database and security components.

UNIT	CONTENT	HOURS
UNIT I	Introduction to Computers Generation of Modern Computers- Classification of Digital Computer Systems Anatomy of a Digital Computer Input Devices: Keyboard- Mouse-Track Ball- Joystick- Digital camera-MICR- OCR- Barcode Reader- Touch Screen-Light Pen. Output Devices: Monitor- Printer- Sound Card- and Speaker.	6
UNIT II	Memory Units: RAM-ROM- PROM- EPROM- and EEPROM Auxiliary Storage Devices: Magnetic Storage Devices Floppy Diskettes- Hard Disks- Removable Hard Disks- Magnetic Tapes- Optical Storage CD-ROM.	6
UNIT III	Programming Languages: Machine Language, Assembly Language, High Level Language, Types of High Level Language, Compiler and Interpreter.	6
UNIT IV	Overview of Network: Communication Processors, Communication Media, Types of Network, Network Topologies, Network Protocols, Network Architecture, Introduction to Internet & WWW, E-Mail, Intranet.	6

UNIT V	Introduction to Multimedia - Multimedia Applications - Computers at Home, Education, Entertainment, Science, Medicine and Engineering - Introduction to Computer Security - Computer Viruses, Bombs, Worms.	6

Text Books:

1. Alexis Leon and Mathews Leon, Fundamentals of Information Technology, Leon TECH World, 1999.
2. Alexis Leon and Mathews Leon, Introduction to Computers , Leon TECH World, 1999.

Reference Books:

1. Peter Norton, Introduction to Computers , TMH 6th Edition 1998 (for Units IV,V Chapters 13,14).

Web Resources:

http://itacademic.ir/upload/IT_Fund.&Infra-1.pdf

https://cstutorialpoint.com/computer-fundamentals-notes/

https://ashishmodi.weebly.com/uploads/1/8/9/7/18970467/computer_fundamental.pdf

https://egyankosh.ac.in/bitstream/123456789/35776/5/BLI-224-%20B1.pdf

Course Outcomes:

On completion of the Course, learner should be able to,

- Defines computer and its generations
- Explains computers and data processing
- Defines hardware and software concepts
- Defines input and output units computers
- Expresses memories hardwares.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-I / VE	**Value Education**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To understand the philosophy of life and values through Thirukural
- To analyse the components of values education to attain the sense of citizenship
- To understand different types of values towards National Integration and international understanding
- To learn yoga as value education to promote mental and emotional health
- To understand human rights, women rights and other rights to promote peace and harmony

UNIT	CONTENT	HOURS
UNIT I	PHILOSOPHY OF LIFE AND SOCIAL VALUES: Human Life on Earth (Kural 629) -Purpose of Life (Kural 46) -Meaning and Philosophy of Life (Kural 131, 226) -Family (Kural 45), Peace in Family (Kural 1025) Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) Five responsibilities / duties of Man (a) to himself (b) to his family (c) to his environment (d) to his society, (e) to the Universe in his lives (Kural 43, 981).	6
UNIT II	HUMAN VALUES AND CITIZENSHIP : Aim of education and value education: Evolution of value oriented education, Concept of Human values: types of Values- Character Formation – Components of Value education- A P J Kalam's ten points for enlightened citizenship- The role of media in value building.	6
UNIT III	VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL DEVELOPMENT: Constitutional or national values: Democracy, socialism, secularism, equality, Justice, liberty, freedom and fraternity - Social Values: Pity and probity, self-control, universal	6

	brotherhood - Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith -Religious Values: Tolerance, wisdom, character - Aesthetic Values- Love and appreciation of literature and fine arts and respect for the same- National Integration and International Understanding.	
UNIT IV	YOGA AND HEALTH: Definition, Meaning, Scope of Yoga - Aims and objectives of Yoga - Yoga Education with modern context - Different traditions and schools of Yoga - Yoga practices: Asanas, Pranayama and Meditation.	6
UNIT V	HUMAN RIGHTS: Concept of Human Rights: Indian and international perspectives- Evolution of Human Rights- definitions under Indian and International documents -Broad classification of Human Rights and Relevant Constitutional Provisions: Right to Life, liberty ad Dignity- Right to equality- Right against exploitation- Cultural and Educational Right- Economic Rights- Political Rights- Social Rights - Human Rights of Women and Children – Peace and harmony.	6

Text Books:

1. Thirukkural with English Translation of Rev. Dr. G.U. Pope, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613 004.
2. V.R. Krishna Iyer, Dialetics and Dynamics of Human Rights in India, Tagore Law Lectures.
3. Yogic Thearpy - Swami Kuvalayananda and Dr.S.L.Vinekar, Government of India, Ministry of Health, New Delhi.
4. SOUND HEALTH THROUGH YOGA - Dr.K.Chandrasekaran, Prem Kalyan Publications,
5. Sedaptti, 1999.

Reference Books:

1. Grose. D. N – "A text book of Value Education' New Delhi (2005)
2. Gawande . EN – "Value Oriented Education" – Vision for better living. New Delhi (2002) Saruptsons
3. Brain Trust Aliyar- "Value Education for Health, Happiness and Harmony" Erode (2004) Vethathiri publications

Web Resources:

https://www.studocu.com/in/document/thiruvalluvar-university/bcom-general/value-education-study-material-1/24751487

https://www.dypiemr.ac.in/images/value-added-courses/vac/Content-for-Value-Education.pdf

https://mrcet.com/downloads/digital_notes/CSE/Mtech/I%20Year/Value%20education%20Digital%20notes.pdf

Course Outcome:

On completion of the Course, learner should be able to,

- Apply the values in thirukkural to be peaceful,dutiful and responsible in family and society.
- Develop character formation and sense of citizenship.
- Be secular,self control,sincere,respectful and moral.
- Master yoga,asana and meditation to promote mental health.
- Be attitudinal to follow the constitutional rights.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-II/ Core Course (CC- II)	**Data Structures using C++**	**Course Code:**
Instruction Hours: 5	**Credits: 4**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To give the concepts of object oriented programming and to impart the programming skills in C++.
- Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- Understand dynamic memory management techniques
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
- Demonstrate the use of various OOPS concepts with the help of programs

UNIT	CONTENT	HOURS
UNIT I	DATA ABSTRACTION & OVERLOADING : Overview of C++ – Structures – Class Scope and Accessing Class Members – Reference Variables – Initialization – Constructors – Destructors – Member Functions and Classes – Friend Function – Dynamic Memory Allocation – Static Class Members– Overloading: Function overloading and Operator Overloading.	15
UNIT II	INHERITANCE & POLYMORPHISM: Base Classes and Derived Classes – Protected Members – Casting Class pointers and Member Functions – Overriding – Public, Protected and Private. Inheritance – Constructors and Destructors in derived Classes. Virtual functions – This Pointer – Abstract Base Classes and Concrete Classes – Virtual Destructors – Dynamic Binding.	15
UNIT III	LINEAR DATA STRUCTURES: Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation — singly linked lists –Polynomial Manipulation - Stack ADT – Queue ADT - Evaluating arithmetic expressions.	15

UNIT IV	NON-LINEAR DATA STRUCTURES: Trees – Binary Trees – Binary tree representation and traversals – Application of trees: Set representation and Union-Find operations – Graph and its representations – Graph Traversals – Representation of Graphs – Breadth-first search – Depth- first search - Connected components. SORTING and SEARCHING:	15
UNIT V	SORTING and SEARCHING: Sorting algorithms: Insertion sort - Quick sort - Merge sort - Searching: Linear search –Binary Search.	15

Text Books:

1. E. Balagurusamy, "Object Oriented Programming with C++", TMG, 8th Ed., New Delhi, 2017.
2. Seymour Lipschutz, "Data Structures", Tata McGraw Hill Publishing Company Limited, Revised 5th edition, New Delhi, 2014. UNITS: III, IV & V.

Reference Books:

1. Robert Lafore, "Object Oriented Programming in Microsoft C++", Galgotia Publications,4th edition, New Delhi, 2000.
2. Bjarne Stroustrup, "The C++ Programming Language", Addison- Wesley, 4th edition., 2013

Web-Resources:

https://www.w3schools.com/**cpp**/ http://nptelvideos.com/video.php?id=2187&c=28

Course Outcomes:

On completion of the Course, learner should be able to

- Learn the basic concepts in Object-Oriented programming.
- Develop programming skills by applying Object-Oriented programming.
- Discuss the function overloading and Member Functions.
- Understand the concepts of Constructors and Inheritance.
- An Ability to incorporate Exception Handling in Object-Oriented programs and analyze File Input/output Streams.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-II / Core Practical II(CP –II)	**Data Structures using C++ Lab**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To understand the procedural and object oriented paradigm with concepts ofstreams, classes, functions, data and objects.
- Understand how to produce object-oriented software using C++
- To familiarize the students with language environment.
- To implement various concepts related to language.
- Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.

List of Practicals:

1. a) Program to find factorial of a given number.
   b) Program to convert dollars to rupees.
2. Program to illustrate the call by value and call by reference
3. a) Program to find the largest of three numbers using inline function.
   b) Program to find mean of 'N' numbers using friend function.
4. Program to find volume of cube, cylinder and rectangular box using function overloading.
5. Matrix Addition and Multiplication operations
6. To find an element using Sequential and binary search.
7. Perform the following types of Sorting: i. Bubble sort ii. Insertion sort iii. Selection sort
8. To PUSH and POP an element from STACK.
9. To Insert and Delete an element from QUEUE.
10. To insert and delete a node in a linked list.

Course Outcomes:

On completion of the Course, learner should be able to

- Describe the procedural and object oriented paradigm with concepts of streams.
- Understand the classes,functions, data and objects.
- Understand dynamic memory management techniques using pointers.
- Describe about the constructors and destructors.
- Understand about the sorting,searching and bioinformatics.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-II / Skill Enhancement Course II (SEC II)	**Computational Skills and Internet Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- Office tools course would enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools.
- Give students an in-depth understanding of why computers are essential components in business, education and society.
- Provide foundational or "computer literacy" curriculum that prepares students for life-long learning of computer concepts and skills.
- Find evaluate and use online information resources.
- Create HTML documents and enhance them with browser extensions.

List of Practical's:

MS-WORD

1. Text Manipulations
2. Usage of Numbering, Bullets, Tools and Headers
3. Usage of Spell Check and Find and Replace
4. Picture Insertion and Alignment
5. Mail Merge Concept
6. Copying Text and Picture
7. Creation of Tables, Formatting Tables
8. Splitting the Screen

MS-EXCEL

1. Creation of Worksheet and Entering Information
2. Aligning, Editing Data in Cell
3. Date and Time Function
4. Mathematical Functions
5. Moving, copying, Inserting and Deleting Rows and Columns

6. Drawing Borders Around Cells
7. Creation of Charts and Changing Chart Type

MS -POWER POINT

Working With Slides

1. Creating, saving, closing presentation
2. Adding Headers and footers
3. Changing slide layout
4. Working fonts and bullets
5. Inserting Clip art: working with clipart
6. Applying Transition and animation effects
7. Run and Slide Show

INTERNET

1. E-Mail Creation
2. Using Search Engines
3. E-Pay
4. Online Shopping
5. Submitting Forms Online
6. Online converter (pdf, word, image, etc.,)
7. Design a Web site on your college.
8. Prepare the invitation using Online Software.

Course Outcomes:

On completion of the Course, learner should be able to

- To perform documentation activities
- To execute accounting operations
- To enhance presentation skills
- Create web pages using HTML
- Build dynamic web pages

Semester-II **EVS**	**Environmental Studies**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level
K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To develop a world population that is aware of and concerned about the environment and its associated problems
- To develop the knowledge
- To ensure the Skills and attitudes
- To develop motivations
- Develop commitment to work individually and collectively towards solutions of current problems and prevention.

UNIT	CONTENT	HOURS
UNIT I	The Multidisciplinary nature of environmental studies Definition, scope and importance. Need for public awareness.	8
UNIT II	Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resources, land degradation, man induced Landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	8
UNIT III	Ecosystems Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers Energy flow in the ecosystem Ecological succession. Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and function of the following ecosystem:- a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)	8

UNIT IV	Biodiversity and its conservation Introduction – Definition : Genetic, species and ecosystem diversity Bio geographical classification of India Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values Biodiversity at global, National and local levels India as a mega-diversity nation Hot-spots of biodiversity Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	8
UNIT V	Environmental Pollution Definition Causes, effects and control measures of: a. Air Pollution b. Water Pollution c. Soil Pollution d. Marine Pollution e. Noise pollution f. Thermal Pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution Pollution case studies Disaster management: floods, earthquake, cyclone and landslides. Ill-Effects of Fireworks: Firework and Celebrations, Health Hazards, Types of Fire, Firework and Safety	8
UNIT VI	Social Issues and the Environment From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation Public awareness.	7
UNIT VII	Human Population and the Environment Population growth, variation among nations. Population explosion – Family Welfare Programmes Environment and human health Human Rights - Value Education HIV/ AIDS - Women and Child Welfare Role of Information Technology in Environment and human health .Case studies.	8
UNIT VIII	Field Work Visit to a local area to document environmental assets-river / forest/ grassland/ hill/ mountain	-

Reference Books:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt ltd, Ahamedabad – 380013,India, E- mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. CambridgeUniversity Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub.House, Delhi 284 p.

12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science(TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB).

Reference Books:

1. Robert Lafore, "Object Oriented Programming in Microsoft C++", Galgotia Publications,4th edition, New Delhi, 2000.
2. Bjarne Stroustrup, "The C++ Programming Language", Addison- Wesley, 4th edition., 2013

Web-Resources:

http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20Rules,%202004.pdf.

Course Outcomes:

On completion of the Course, learner should be able to

- Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
- Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
- Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-II-Extra Credit II (EC II)	**Data Entry Operator with DTP (Theory and Practical)**	**Course Code:**
Instruction Hours:	**Credits: 2**	**Exam Hours: -**
Internal Marks :-	**External Marks:-100**	**Total Marks: Grade**

Course Objectives:

- To understand the basics of computers.
- To develop skills in computer software.
- To gain knowledge of Microsoft Office tools such as Word, Excel, and PowerPoint.
- To develop skills in typing and data entry.
- To learn to use file management software for data organization.

UNIT I: **Marks:40**

Basics of Computer

Input Devices

- Keyboard
- Mouse
- Trackball
- Scanner
- Barcode reader
- Digitizer
- OCR,MICR

Output Devices

- Monitor
- Printers
- Plotters
- Soundcard and speakers
- System Software and Application Software
- Computer Language
- Compiler and Assembler

UNIT II:

Formatting Documents

- Working with text
- Formatting Paragraphs
- Creating Bulleted and Numbered Lists
- Spelling and Grammar

UNIT III:

Formatting Worksheets

- Formatting Toolbar
- Formatting Cells
- Formatting Columns and Rows
- Protect and Unprotect Worksheets

DESKTOP PUBLISHING LAB **Marks:60**

MS-Windows

- Introduction to Computer
- Computer Basic
- Creating Folder
- Directories

PageMaker

- Page Layout, Word Wrapping
- Grouping, Merging two or more files
- Creating columns, Tab settings
- Paragraph settings, Fonts, Mixing Text & Graphics

CorelDraw

- Logo Designing, Frame Settings
- Graphical Tools, Bitmap & Shadow Effects
- Special Effects such as Perspective
- Blending, Text Settings into objects
- Alignment Setting
- Tabs, Power Line
- Power Clip
- Contour

Photoshop

- Marquee Tool
- Magnetic Tool
- Slice Tool
- Patch Tool
- CloneStamp Tool
- Gradient Tool
- Smudge Tool
- Blur Tool,
- Text Tool
- Fill, Stroke Option
- Group, Ungroup

Course Outcome:

- Identify different computer components, install and setup operating system and related software in a computer following safety precautions.
- Create, format and edit document using Word processing application software.
- Create, format, edit and develop a workbook by using Excel.
- Edit images/photos by using Paint and Office Picture Manager Application software.
- Create and customize slides for presentation by using Power Point.

Semester-III / Core Course III(CC III)	**Web Technology**	**Course Code:**
Instruction Hours: 5	**Credits: 4**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- Understand the fundamental concepts of web technology.
- Learn the basics of server side programming.
- Infer web services, UDDI and WSDL.
- Build online applications using web technology.
- Demonstrate the database connectivity.
- Discuss online security and payment processing mechanisms.

UNIT	CONTENT	HOURS
UNIT I	Internet Basics: Basic Concepts – Internet Domains – IP Address – TCP/IP Protocol – The WWW – The Telnet — Introduction to HTML: Web server - Web client / browser - Tags – Text Formatting – Lists – Tables – Linking Documents - Frames.	15
UNIT II	JavaScript: JavaScript in Web Pages – The Advantages of JavaScript – Writing JavaScript into HTML – Syntax – Operators and Expressions – Constructs and conditional checking – Functions – Placing text in a browser– Dialog Boxes – Form object's methods – Built in objects – user defined objects.	15
UNIT III	XML: Comparison with HTML – DTD – XML elements – Content creation – Attributes –Entities – XSL – XLINK – XPATH – XPOINTER – Namespaces –Applications – integrating XML with other applications.	15
UNIT IV	JSP Fundamentals: Basics – Directive basics – Page directive – The tag lib directive – The include directive – JSP Standard Actions – Java Beans –Error Handling.	15
UNIT V	EXTENSIBLE MARK-UP LANGUAGE (XML): Introduction- HTML vs. XML- Syntax of the XML Document- XML Attributes- XML Validation- XML DTD- The Building Blocks of XML Documents- DTD Elements - DTD Attributes- DTD Entities- DTD Validation –XSL - XSL Transformation- XML Namespaces- XML Schema	15

Text Books:

1. "Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI", Ivan Bayross, BPB Publication. UNIT I & II

2. "XML Bible", Elliotte Rusty Harold, 2nd Edition, Wrox Publication. UNIT III

Reference Books:

1. "Beginning Java Server Pages", Vivek Chopra, Sing Li, Rupert Jones, Jon Eaves, John T. Bell, Wrox Publications. UNIT IV

2. "Practical ASP", Ivan Bayross, BPB Publication. UNIT V

Web-Resources:

http://www.srmuniv.ac.in/sites/default/files/2017/CS1019-web-tech.pdf

https://www3.ntu.edu.sg/home/ehchua/programming/java/JavaServerPages.html

https://www.tutorialspoint.com/jsp/jsp_overview.htm

https://www.w3schools.com/asp/asp_introduction.asp

Course Outcomes:

On completion of the Course, Students should be able to do

- Explain the history of the internet and related internet concepts that are vital in understanding web development.
- Discuss the insights of internet programming and implement complete application over the web.
- Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
- Utilize the concepts of JavaScript and Java
- Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-III / Core Practical III (CP III)	**Web Technology Lab**	**Course Code:**
Instruction Hours: 3	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To organize vast reams of molecular biology data in an efficient manner.
- To develop tools that aid in the analysis of such data.
- To interpret the results accurately and meaningfully.
- Bioinformatics is designed for students interested in molecular biology and genetics, information technologies and computer science.
- Bio informaticists are involved in the analysis of the human genome, identification of targets for drug discovery, development of new algorithms and analysis methods, the study of structural and functional relationships, and molecular evolution.

List of Practicals:

1. Exercises using Formatting Tags.
2. Exercises to implement table tags.
3. Exercises using List Tags.
4. Exercises to implement Frames and Frame sets
5. Exercises using Cascading Style Sheets.
6. Exercises to implement image, background color and text.
7. Exercises using Radio buttons, Check boxes and List boxes
8. A Web Page in HTML to show your resume using appropriate Formatting Elements.
9. A Web Page in HTML to show books in inventory in different tables using Row Span and Column Span.
10. Exercises to implement ADD, DELETE and UPDATE records in the table using ADO.NET.

Course Outcomes:

On completion of the Course, learner should be able to

- Develop skills in analyzing the usability of a web site.
- Understand how to plan and conduct user research related to web usability.
- Design, develop and host a user friendly website.
- Know the usage of APIs.
- Layout management in line with current trend.

Mapping of COs with POs & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-III / Second Minor Course I(SMC I)	**Digital Electronics**	**Course Code:**
Instruction Hours: 4	**Credits: 3**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To understand the principles of digital logic circuits and their design.
- To prepare students to perform the analysis and design of various digital electronic circuits.
- To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
- To familiarize with the different number systems, logic gates, and combinational and sequential circuits utilized in the different digital circuits and systems.
- To introduce the basic concepts and laws involved in the Boolean algebra and logic families and digital circuits.

UNIT	CONTENT	HOURS
UNIT I	Number Systems: Decimal, Binary, Octal and Hexadecimal number systems- Conversion between number systems- Binary arithmetic-BCD codes – BCD addition- Alphanumeric codes. Boolean Algebra and logic gates : AND, OR, NOT, NAND, NOR, XOR and XNOR gates Truth tables- Basic laws of Boolean Algebra – De-Morgan's theorems.	12
UNIT II	Simplifications of Boolean expressions- Canonical SOP and POS forms- Karnaugh maps Implementing Boolean expressions using NAND gates alone- Implementing Boolean expressions using NOR gates alone. Combinational logic circuits: Half and Full adders- Half and Full subs tractors- Parallel binary adder- BCD adder- Encoders- Decoders- Multiplexers- Demultiplexers.	12
UNIT III	Sequential logic circuits: NAND latch – SR flip-flop- JK flip-flop – Edge triggering- PRESET and CLEAR inputs – Shift register- Universal shift register- Asynchronous and Synchronous counters – BCD counter.	12
UNIT IV	Parallel Computer Models: Introduction, Flynn's classification, Parallel & Vector Computers system Attributes to performance, implicit & Explicit parallelism, shared, Memory Multiprocessors. Uniform and Non-uniform Memory Access and Cache only Memory Access Models, distributed Memory Multicomputers Multivector & SIMD Computers, PRAM and VLSI Models	12

UNIT V	Processors and Memory hierarchy: CISC & RISC Architectures, CISC Family, RISC scalar processors, Super Scalar Processors and their features. Very Long Instruction word Architecture vector & Symbolic processors, Memory Hierarchy.	12

Text Book:

1. Moris Mano, " Digital Computer Fundamentals" TMH, III rd Edition
2. Thomas C Bartee " Computer Architecture and logic Design " TMH

Reference Books:

1. Malvino and Leech " Digital Principles and Applications" , TMH
2. Badri Ram, "Fundamentals of Microprocessor and Microcomputers" Dhanpat Rai and Sons.
3. Liu and Gibson " Microcomputer Systems" PHI

Web – Resources:

https://mrcet.com/downloads/digital_notes/IT/DIGITAL%20LOGIC%20DESIGN%20(R17A0461).pdf

https://www.shahucollegelatur.org.in/Department/Studymaterial/sci/it/BCA/FY/digielec.pdf

Course Outcomes:

1. Understand the functionalities of various gates in a Digital computer
2. Simplify the expressions using Karnaugh Map
3. Learn the fundamental principles of digital electronics Circuits used in Arithmetic operations
4. Discuss the design of memory using Flip-Flops, Registers and Counters
5. Ability to identify basic requirements for a design application and propose a cost effective solution.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-III / Second Minor Practical I(SMP I)	**Digital Electronics Lab**	**Course Code:**
Instruction Hours: 2	**Credits: -**	**Exam Hours: -**
Internal Marks :-	**External Marks:-**	**Total Marks: -**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objective:

- Define different types of logic gates, identify their ICs and also verify their truth table.
- To analyze and design combinational logic and sequential logic circuits.
- Understand the basic software tools for the design and implementation of digital circuits and systems.
  To introduce the basic concepts of *microprocessor* and to develop in students the Assembly language programming skills and real time applications of Microprocessor**.**
- Understand the architecture of 8085 and 8051.

List of Practical's:

Experiments with Digital IC's

1. Study of Universal IC gates (NAND and NOR) –construction of AND, OR, NOT and EXOR using universal gates.
2. Half adder and Full adder (using AND, OR, NOT and EXOR gates only)
3. Half Subtractor and Full Subtractor (Using AND, OR, NOT and EXOR gates only)
4. Karnaugh Map reduction of Boolean Expressions (Three variables expressions only)
5. Verify the truth table of one bit and two bit comparator using logic gates.

Microprocessor

1. 8-bit addition, subtraction, multiplication and division
2. Sum of series (8-bit)
3. Maximum and minimum values
4. Sorting (Ascending and Descending order)
5. Hexadecimal to decimal and decimal to hexadecimal conversion (simple logic only)

Course Outcomes:

On completion of the Course, learner should be able to

- Learn the basics of gates.
- Construct basic combinational circuits and verify their functionalities
- Apply the design procedures to design basic sequential circuits
- Understand real mode Memory addressing and ability to interface various devices to the microprocessor.
- Provide practical hands-on experience with microprocessor applications and interfacing technique

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-III /Multi Disciplinary Course I NME I	**1.DTP Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- Demonstrate knowledge of terminology related to desktop publishing, graphics andanimation, and multimedia.
- Identify and use hardware components (input and output devices) used in desktoppublishing, graphics/animation and multimedia.
- Analyze the impact of desktop publishing, graphics/animation and multimedia onsociety.
- Model respect for intellectual property when manipulating, morphing, and editingvideo, graphics, sound, and text.
- Identify and use appropriate software and documentation for an identified audience to create projects in desktop publishing, graphics/animation and multimedia.

PAGEMAKER

1. To Create a new document using the PageMaker Software.
2. To Create an ID card using PageMaker Software.
3. To Create a Student Notice Board using PageMaker Software.
4. To Create a Visiting Card using PageMaker Software.
5. To Create a Brochure using PageMaker Software.

CORELDRAW

1. Create a Logo for a company using the appropriate tools.
2. Create an Invitation card using the appropriate tools.
3. Create an Business Card using the appropriate tools.
4. Make two or three different shapes or write some text and try to use the following tools in that drawing.

    - Interactive Blend tool
    - Interactive Contour tool
    - Interactive Transparency tool
    - Interactive Drop shadow tool

Course Outcomes:

On completion of the Course, learner should be able to

- Understand the various steps in designing a creative and dynamic website.
- Able to write CSS.
- Understand of hierarchy of objects in HTML
- Able to create good, effective and customized websites.
- Understand the visual elements in a document.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-III **Multi Disciplinary Course I(NME I)**	**2.Web Designing Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To understand the importance of the web as an effective medium of communication.
- To develop basic skills in analyzing the usability of a web site.
- To develop hands on experience using open source technologies such as HTML, CSS,JavaScript, PHP and MySQL.
- To implement static, dynamic and interactive web pages and web applications.
- To be able to analyze the available open source technologies and select the appropriateone based on need.

List of Practicals:

1. Design a Bio-Data Form.
2. Create a Web Page With Four Frame (Picture, Table, List, Hyperlink).
3. Write a Program to show all Character Entities.
4. To Create a Web Page in HTML to Show the Block Level Elements and Text Level Elements.
5. Create your own page with your favourite hobbies.
6. A Web Page in HTML to show books in inventory in different tables using Row Span and Column Span.
7. Create a Web Page in HTML to show Admission form.
8. A Web Page in HTML to show your resume using appropriate Formatting Elements.
9. A Web Page in HTML to show all the Text, Color, Background and Font Elements.
10. Write a Program to Create a Nested List.

Course Outcomes:

On completion of the Course, learner should be able to

- Develop skills in analyzing the usability of a web site.
- Understand how to plan and conduct user research related to web usability.
- Design, develop and host a user friendly website.
- Know the usage of APIs.
- Layout management in line with current trend.

Mapping of COs with POs & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester- III / skill Enhancement Course III (SEC III)	**PHP Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-**Acquire/ Remember**	K2-**Understanding**	K3-**Apply**	K4-**Analyze**	K5-**Evaluate**	K6-**Create**

Course Objective:

- To acquire practical knowledge of the Server Side Scripting and database basics and to develop applications using PHP and MySQL.
- Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.
- Analyze the basic structure of a PHP web application and be able to install and maintain the web server, compile, and run a simple web application.
- Learn how databases work and how to design one, as well as how to use php MyAdmin to work with MySQL.
- Learn different ways of connecting to MySQL through PHP, and how to create tables, enter data, select data, change data, and delete data. Connect to SQL Server and other data sources.

List of Practical's

1. Working with PHP operators
2. Working with different types of looping statements using php
3. Working with different types of array using php
4. Working with PHP functions
5. Working with PHP forms
6. PHP form validation
7. Working with PHP math/date function
8. Executing DML and DDL commands using MySQL
9. Joining tables
10. Retrieving data from table using PHP
11. Inserting data into table using PHP
12. Create an application using PHP and MySQL.

Course Outcomes:

Students will be able to

- Learn the environment of Server Side Script.
- Compare and contrast between Client Side Script & Server Side Script.
- Learn the use of control structures and numerous native data types with their methods.
- Make Database connectivity between Front End and Back End.
- Develop Dynamic Website that can interact with different kinds of Database Languages.

Semester-IV/ Core Course IV (CC IV)	**Java Programming**	**Course Code:**
Instruction Hours: 5	**Credits: 4**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- Programming in the Java programming language,
- Knowledge of object-oriented paradigm in the Java programming language,
- The use of Java in a variety of technologies and on different platforms.
- To Learn Why Java is useful for the design of desktop and web applications.
- To learn how to implement object oriented designs with Java.
- To identify Java language components and how they work together in applications.

UNIT	CONTENT	HOURS
UNIT I	JAVA Evolution: History - Features - Java differs from C and C++ -Java and Internet - Java and WWW - Web Browsers. Overview of Java Language: Introduction - Simple Java program - Structure- Java tokens- Statements - Java virtual Machine.	15
UNIT II	Constants -Variables- Data types - Operators and expressions -Decision making and Branching: Simple If Statement, the IF…Else statement, The Else... If ladder, The Switch Statement, The? : Operator, Decision making and looping: The While statement, the do Statement - The for Statement - Jumps in loops - labeled loops - Classes, Objects and Methods.	15
UNIT III	Arrays, Strings and Vectors – Interfaces- Multiple Inheritance – Packages: Putting classes together Multi Threaded Programming.	15
UNIT IV	Managing Errors and Exceptions – Applet Programming – Graphics programming: The Graphics class-Lines and rectangles-Circles and ellipses-Drawing arcs-Drawing polygons- Line graphs-Using Control loops in applets-Drawing Bar charts.	15
UNIT V	Files: Introduction – concept of streams – Stream classes – Using stream – I/O classes – File class – I/O Exceptions – creation of files – Reading / Writing characters/ Bytes – Handling primitive data types – Random Access Files.	15

Text Book:

1. E. Balaguruswamy,Programming with JAVA -A Primer,Mc Graw Hill Professional,6th edition,2015.

Reference Books:

1. Herbert Schildt, Java: The CompleteReference, McGraw Hill Professional,7th edition, 2017.
2. Robert Sedgewick & Kevin Wayne, Introduction to Programmingin Java, Addison Wesley, 2017.

Web-Resources:
https://www.tutorialspoint.com/java/index.htm
https://www.javatpoint.com/java-tutorial

Course Outcomes:
On Completion of the course the student should be able to

- Use an integrated development environment to write
- Compile and run
- Test simple object oriented java programs.
- Read and make elementary modifications to Java programs that solve real worldproblems
- Validate input in a Java Program

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-IV / Core Practical IV (CP IV)	**Java Programming Lab**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- Understand fundamentals of programming such as variables, conditional and iterative execution, API's etc.
- Understand fundamentals of object oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Have the ability to write computer programs to solve specific problems.
- Be able to use the Java SDK environment to create, debug and run Java programs.
- To implement front end and back end of an application

List of Practicals:

1. Exercises using classes and objects
2. Exercises using Control Statements
3. Exercises using different Inheritance
4. Exercises using Mouse Events
5. Exercises for implementing the font class method
6. Exercises to implement Exception Handling
7. Exercises using Interfaces
8. Exercises to illustrate the Thread Priority
9. Write a Java program using Applet

   a)To display a message.

   b)For passing parameters.
10. Write a Java programs for using Graphics class to display basic shapes and fill them and setbackground and foreground colors.

Course Outcomes:

On completion of the Course, learner should be able to

- Implement Object Oriented programming concept using basic syntax's of control Structures, strings.
- Demonstrate the function for developing skills of logic building activity.
- Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
- Demonstrate understanding and use of different exception handling mechanisms and concept of multi threading for robust faster and efficient application development.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-IV /Second Minor Practical I(SMP I)	**Digital Electronics Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objective:

- Define different types of logic gates, identify their ICs and also verify their truth table.
- To analyze and design combinational logic and sequential logic circuits.
- Understand the basic software tools for the design and implementation of digital circuits and systems.
- Understand the architecture of 8085 and 8051.
- To introduce the basic concepts of *microprocessor* and to develop in students the Assembly language programming skills and real time applications of Microprocessor**.**

List of Practical's:

Experiments with Digital IC's

1. Study of Universal IC gates (NAND and NOR) –construction of AND, OR, NOT and EXOR using universal gates.
2. Half adder and Full adder (using AND, OR, NOT and EXOR gates only)
3. Half Subtractor and Full Subtractor (Using AND, OR, NOT and EXOR gates only)
4. Karnaugh Map reduction of Boolean Expressions (Three variables expressions only)
5. Verify the truth table of one bit and two bit comparator using logic gates.

Microprocessor

1. 8-bit addition, subtraction, multiplication and division
2. Sum of series (8-bit)
3. Maximum and minimum values
4. Sorting (Ascending and Descending order)
5. Hexadecimal to decimal and decimal to hexadecimal conversion (simple logic only)

Course Outcomes:

On completion of the Course, learner should be able to

- Learn the basics of gates.
- Construct basic combinational circuits and verify their functionalities
- Apply the design procedures to design basic sequential circuits
- Understand real mode Memory addressing and ability to interface various devices to the microprocessor.
- Provide practical hands-on experience with microprocessor applications and interfacing technique

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-IV / Second Minor Course III(SMC II)	**Microprocessor and Microcontroller**	**Course Code:**
Instruction Hours: 4	**Credits: 3**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire/ Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate

Course Objectives:

- To introduce the internal organization of Intel 8085 Microprocessor.
- To enable the students to write assembly language programs using 8085.
- To interface the peripheral devices to 8085 using Interrrupt controller .
- To enable the DMA interface.
- To provide real-life applications using microcontroller.

UNIT	CONTENT	HOURS
I	Digital Computers - Microcomputer Organization-Computer languages – Microprocessor Architecture and its operations – Microprocessor initiated operations and 8085 Bus organization – Internal Data operations and 8085 registers - Peripheral or External initiated operations.	12
II	8085 Microprocessor – Pinout and Signals – Functional block diagram - 8085 Instruction Set and Classifications.	12
III	BCD to Binary and Binary to BCD conversions - ASCII to BCD and BCD to ASCII conversions - Binary to ASCII and ASCII to Binary conversions. BCD Arithmetic - BCD addition and Subtraction - Multibyte Addition and Subtraction - Multiplication and Division.	12
IV	The 8085 Interrupts – RIM AND SIM instructions-8259 Programmable Interrupt Controller-Direct Memory Access (DMA) and 8257 DMA controller.	12
V	Introduction to Microcontroller - Microcontroller Vs Microprocessor - 8051 Microcontroller architecture - 8051 pin description. Timers and Counters – Operating Modes- Control Registers. Interrupts – Interrupts in 8051 - Interrupts Control Register – Execution of interrupt.	12

Text Books:

1. R. S. Gaonkar- "Microprocessor Architecture- Programming and Applications with 8085"- 5th Edition- Penram International Publications,2009. [For unit I to unit IV].
2. Soumitra Kumar Mandal -"Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051", Tata McGraw Hill Education Private Limited. [for unit V].

Reference Books

1. Mathur- "Introduction to Microprocessor"- 3rd Edition- Tata McGraw-Hill -1993.
2. Raj Kamal - "Microcontrollers: Architecture, Programming, Interfacing and System Design", Pearson Education, 2005.
3. Krishna Kant, "Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096", PHI, 2008.

Web resources: Web resources from NDL Library, E-content from open source libraries
https://nptel.ac.in/courses/108107029
https://nptel.ac.in/courses/117104072

Course Outcomes:

On completion of the Course, Students should be able to do

1:Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the architecture of 8085.

2: Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic..

3:Applying different types of instructions to convert binary codes and analyzing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.

4: Analyze how peripheral devices are connected to 8085 using Interrupts and DMA controller.

5: An exposure to create real time applications using microcontroller

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-IV / Multi Disciplinary Course II (NME II)	**1.Animation Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To Impart Practical Training in Computer Graphics and Animation related problems.
- To implement various graphics drawing algorithms, 2D-3D transformations and clipping techniques.
- Describe and evaluate the eight major classical types of animation
- Identify modern day examples for each classical animation type.
- Emphasis on creating movement and expression utilizing traditional or electronically generated image sequences.

List of Practicals:

Photoshop:

1. (i) Handling different file formats and interchanging them, changing the resolution,color, grayscales and size of the images
   (ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

Flash :

Develop an image(s) and do the following:

1. Basic Drawing and Painting
2. Working with Strokes and Fills
3. Creating Custom Colors, Gradients, and Line Styles Transforming and Grouping Objects.
4. Creating and Managing Multiple Layers
5. Converting Text into Shapes
6. Animate using motion, shape, Tweening, and actions

Course Outcomes:

On completion of the Course, learner should be able to

- Communicate ideas, believable action and emotion effectively by employing principles
- Animation and performance in all aspects of drawing.
- Integrate the concepts, principles and theories involved in the physics of animation in all aspects of drawing.
- Design layouts and backgrounds that incorporate principles of composition, perspective and colour, with speed and accuracy.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-IV / Multi Disciplinary Course II(NME II)	**2.HTML and CSS Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire /Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- Describe how web pages are delivered over the Internet.
- Build structured HTML pages with text, links, images, tables, and forms
- Use style sheets (CSS) for colors, background and formatting text.
- Describe the page layout and simple transition, transformation, and animation effects
- Use Responsive Web Design techniques to make pages display well on all devices they may be viewed on.

List of practicals:

HTML

1. Usage of New Semantic Elements
2. Create Page Structure and Navigation
3. Create Form Input and Validation.
4. Create Image onto Canvas.

CSS

1. Selectors and Colors
2. Text and Drop Shadows
3. Transition- Rotating Box
4. Linear Gradient and Radial gradient.
5. 2D and 3D Animations
6. SVG, Drag and Drop.

Course outcomes:

On completion of the Course, learner should be able to,

- Define the knowledge about HTML document with element types, hyperlinks, images, list, tables and forms.
- Understand the concept of CSS for dynamic presentation effect in HTML and XML documents.
- Describe the mark-up languages for processing, identifying and presenting information in web pages.
- Apply scripting languages in HTML document to add interactive components to web pages.
- Illustrate the web technology concept to create schemas and dynamic web pages.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-VI / Ability Enhancement Course I(AEC I)	**GIMP Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To understand about data compression techniques, image compression techniques like JPEG,video compression techniques like MPEG, and the basic concepts about animation.
- To offer the knowledge of creating and working with digital images .
- To manipulate them and to develop a presentation package using multimedia tools.
- To give an overall view of multimedia tools.
- To understand and differentiate text, image, video & audio.

List of Practical's:

GIMP (Photoshop Equivalent)

1. Cropping images using Lasso Tools
2. Designing Pictures using Paint Tools
3. Designing Text using Text Tools
4. Applying Layer Effects to Images and Texts

Synfig (wiki.synfig.org / Category: Tutorials) (Flash equivalent)

1. Create an animation for bouncing a ball
2. Create brushed outlines for an image
3. Build a magnifying glass
4. Develop a slide show of photos with transitions

Aptana (http://content.aptana.com/aptana/tutorials/ **)(Dreamweaver equivalent)**

1. Developing a simple webpage with images and links
2. Develop a webpage displaying the timetable of the Department
3. Design an application form for Student Admission
4. Create your own web blog for college events

Course Outcomes:

On completion of the Course, learners should be able to

- To learn and understand technical aspect of Multimedia System
- Design and implement an animation for various themes.
- Prepare multimedia advertisement.
- Develop various Multimedia Systems applicable in real time.
- To develop multimedia application and analyze the performance of the same

Semester- IV / Extra Credit IV(EC IV)	**Computer Literacy Lab**	**Course Code:**
Instruction Hours:	**Credits: 2**	**Exam Hours: -**
Internal Marks :-	**External Marks:100**	**Total Marks: Grade**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- Office tools course would enable the students in crafting professional word documents, excelspread sheets, power point presentations using the Microsoft suite of office tools.
- Give students an in-depth understanding of why computers are essential components in business, education and society.
- Provide foundational or "computer literacy" curriculum that prepares students for life-long learning of computer concepts and skills.
- Evaluate the Chart types
- Use Transition and animation effects.

List of Practical's:

MS-WORD

1. Text Manipulations
2. Usage of Numbering, Bullets, Tools and Headers
3. Usage of Spell Check and Find and Replace
4. Picture Insertion and Alignment
5. Creation of Documents Using Templates`
6. Mail Merge Concept
7. Copying Text and Picture
8. Creation of Tables, Formatting Tables
9. Splitting the Screen

MS-EXCEL

1. Creation of Worksheet and Entering Information
2. Aligning, Editing Data in Cell
3. Date and Time Function
4. Mathematical Functions
5. Moving, copying, Inserting and Deleting Rows and Columns
6. Drawing Borders Around Cells
7. Creation of Charts and Changing Chart Type

MS -POWER POINT

Working With Slides

1. Creating, saving, closing presentation
2. Adding Headers and footers
3. Changing slide layout
4. Working fonts and bullets
5. Inserting Clip art: working with clipart
6. Applying Transition and animation effects
7. Run and Slide Show

Internet:

1. E-Mail Creation
2. Using Search Engines
3. E-Pay
4. Online Shopping
5. Submitting Forms Online
6. Online converter (pdf, word, image, etc.,)
7. Design a Web site on your college.
8. Prepare the invitation using Online Software.

Course Outcomes:

On completion of the Course, learner should be able to

- To perform documentation activities
- To execute accounting operations
- To enhance presentation skills
- Students in both the traditional and Internet classes should use Email within Web to communicate with the instructor.
- List important consumer concerns regarding purchasing items online

Semester-V / Core Course – V(CC V)	**Python Programming**	**Course Code:**
Instruction : 6	**Credits: 5**	**Exam Hours : 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire/ Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- After learning this course, the learner would have acquired the fundamental knowledge on Python programming
- Understood the language and hence the learner becomes skillful in python programming
- Known the usage of modules and packages in python
- Familiarity with the file concept in python been skillful experimenting the concepts of OOPs with python language
- Capable of solving problems using Python

UNIT	CONTENT	HOURS
UNIT I	Python –origins – features – variable and assignment - Python basics - statement and syntax-Identifiers – Basic style guidelines – Python objects – Standard types and other built-in types-Internal types – Standard type operators – Standard type built-in functions	18
UNIT II	Numbers – Introduction to Numbers – Integers – Double precision floating point numbers - Complex numbers – Operators – Numeric type functions – Sequences: Strings, Lists and Tuples – Sequences – Strings and strings operators – String built-in methods – Lists –List type Built in Methods – Tuples.	18
UNIT III	Mapping type: Dictionaries – Mapping type operators – Mapping type Built-in and Factory Functions - Mapping type built in methods – Conditionals and loops – if statement – else Statement – elif statement – conditional expression – while statement – for statement – break statement – continue statement – pass statement – Iterators and the iter( ) function - Files and Input/Output – File objects – File built-in functions – File built-in methods – File built-inattributes – Standard files – command line arguments..	18
UNIT IV	Functions and Functional Programming – Functions – calling functions – creating functions – passing functions – Built-in Functions: apply( ), filter( ), map( ) and reduce( ) - Modules – Modules and Files – Modules built-in functions - classes – class attributes – Instances.	18

UNIT V	Database Programming – Introduction - Basic Database Operations and SQL - Example of using Database Adapters, Mysql - Regular Expression – Special Symbols and Characters – REs and Python.	18

Text Book:

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016
2. Satyanarayana, Radhika Mani, Jagadesh,"Python Programming", Universities Press (India) Pvt. Ltd 20183. Wesley Chun "Core python Programming" Pearson Education,2006.
3. Al Sweigart, "Invent your own computer games with python", 2nd edition, 2008

Reference Books:

1. Bill Lubanovic, "Introducing Python", O"Reilly, First EditionSecond Release, 2014.
2. Tony Gaddis, "Starting out with python", 2nd edition, Addison Wesley, Pearson
3. Michael Dawson, "Python programming for the absolutebeginner", Premier press, 2003.

Web Resources:

https://www.tutorialspoint.com/python/python_data_science
http://astronomi.erciyes.edu.tr/wpcontent/uploads/astronom/pdf/OReilly%20Python%20for%20Data%20Analysis.pdf
https://tanthiamhuat.files.wordpress.com/2018/04/pythondatasciencehandbook.pdf

Course Outcomes:

On completion of the Course, the learner will be able to

- Interpret and manipulate the OOPs Concepts
- Install python and write programs to solve simple problems Explain basic data structures in Python
- Store and manipulate data using file system Implement Python packages and libraries
- Illustrate the concepts of decision making and construct statements.
- Illustrate the usage of database and regular expression

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester- V / Core Course VI (CC VI)	**Computer Networks**	**Course Code:**
Instruction Hours: 6	**Credits: 5**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire/ Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To understand the concept of Data communication and Computer network
- To get a knowledge on routing algorithms.
- To impart knowledge about networking and inter networking devices.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- To gain the knowledge on Security over Network communication

Units	Contents	Hours
I	Introduction – Network Hardware – Software – Reference Models – OSI and TCP/IP Models – Example Networks: Internet, ATM, Ethernet and Wireless LANs - Physical Layer – Theoretical Basis for Data Communication - Guided Transmission Media	18
II	Wireless Transmission - Communication Satellites – Telephone System: Structure, Local Loop, Trunks and Multiplexing and Switching. Data Link Layer: Design Issues – Error Detection and Correction.	18
III	Elementary Data Link Protocols - Sliding Window Protocols – Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols – Bluetooth	18
IV	Network Layer - Design Issues - Routing Algorithms - Congestion Control Algorithms – IP Protocol – IP Addresses – Internet Control Protocols.	18
V	Transport Layer - Services - Connection Management - Addressing, Establishing and Releasing a Connection – Simple Transport Protocol – Internet Transporet Protocols (ITP) - Network Security: Cryptography.	18

Text Books:

A. S. Tanenbaum, "Computer Networks", 4th Edition, Prentice-Hall of India, 2008.

Reference Books

1. A. Forouzan, "Data Communications and Networking", Tata McGraw Hill, 4th Edition, 2017.
2. F. Halsall, "Data Communications, Computer Networks and Open Systems", Pearson Education, 2008.
3. D. Bertsekas and R. Gallagher, "Data Networks", 2nd Edition, PHI, 2008.
4. Lamarca, "Communication Networks", Tata McGraw- Hill, 2002.

Web resources:

https://mrcet.com/downloads/digital_notes/CSE/III%20Year/COMPUTER%20NETWORKS%20NOTES.pdf
https://kanchiuniv.ac.in/coursematerials/VINODKUMAR_COMPUTER_NETWORKS.pdf
https://www.vssut.ac.in/lecture_notes/lecture1423905560.pdf
https://www.svecw.edu.in/Docs%5CCSECNLNotes2013.pdf

Course Outcomes:

- To Understand the basics of Computer Network architecture, OSI and TCP/IP reference models
- To gain knowledge on Telephone systems and Satellite communications
- To impart the concept of Elementary data link protocols
- To analyze the characteristics of Routing and Congestion control algorithms
- To understand network security and define various protocols such as FTP, HTTP, Telnet, DNS.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester- V / Core Course VII(CC VII)	**Advanced Database Management Systems**	**Course Code:**
Instruction Hours: 6	**Credits: 5**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire /Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To enable the students to learn the designing of data base systems, foundation on the relational model of data and normal forms.
- To understood the concepts of data base management system, design simple Database models
- To learn and understand to write queries using SQL, PL/SQL.
- Improve the database design by normalization
- Design ER models to represent simple database application scenarios.

UNIT	Contents	HOURS
I	**Database Concepts:** Database Systems - Data vs Information - Introducing the database -File system - Problems with file system – Database systems. Data models- Importance - Basic Building Blocks - Business rules - Evolution of Data models -Degrees of Data Abstraction.	18
II	**Design Concepts:** Relational database model - logical view of data-keys - Integrity rules - relational set operators - data dictionary and the system catalog - relationships -data redundancy revisited -indexes - codd's rules. Entity relationship model - ER diagram	18
III	**Normalization of Database Tables**: Database tables and Normalization – The Need for Normalization –The Normalization Process – Higher level Normal Form. **Introduction to SQL**: Data Definition Commands – Data Manipulation Commands – SELECT Queries – Additional Data Definition Commands – Additional SELECT Query Keywords – Joining Database Tables.	18
IV	**Advanced SQL**:Relational SET Operators: UNION – UNION ALL – INTERSECT- MINUS.SQL Join Operators: Cross Join – Natural Join – Join USING Clause – JOIN ON Clause – Outer Join.**Sub Queries and Correlated Queries**: WHERE – IN – HAVING – ANY and ALL – FROM. SQL Functions: Date and Time Function– Numeric Function – String Function – Conversion Function	18
V	**PL/SQL**:A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Variable Declaration – Assignment operation –Arithmetic operators.**Control Structures and Embedded SQL**: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. **PL/SQL Cursors and Exceptions**: Cursors – Implicit Cursors, Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.	18

Text Books:

1. Coronel, Morris, Rob, "Database Systems, Design, Implementation and Management", Ninth Edition
2. Nilesh Shah, "Database Systems Using Oracle", 2nd edition, Pearson Education India, 2016

Reference Books

1. Abraham Silberschatz,Henry F.Korth and S.Sudarshan,"Database System Concepts", McGraw Hill International Publication ,VI Edition.
2. Shio Kumar Singh , "Database Systems ",Pearson publications ,II Edition.

Web resources:

https://mrcet.com/downloads/digital_notes/CSE/II%20Year/DBMS.pdf
https://mrcet.com/downloads/digital_notes/ECE/III%20Year/DATABASE%20MANAGEMENT%20SYSTEMS.pdf
https://sircrrengg.ac.in/images/CSEMATERIALS/R19_DBMS_MATERIAL.pdf

Course Outcomes:

On completion of the Course, learner should be able to,

- Understand the various basic concepts of Data Base System. Difference between file system andDBMS and compare various data models.
- Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model.
- Design database schema considering normalization and relationships within database. Understandand construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML).
- Classify the different functions and various join operations and enhance the knowledge of handlingmultiple tables.
- Learn to design Data base operations and implement using PL/SQL programs. Learn basics ofPL/SQL and develop programs using Cursors, Exceptions

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester- V / Core Practical V(CP V)	**Advanced Database Management Systems Lab**	**Course Code:**
Instruction Hours: 5	**Credits: 4**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Course Objectives:

- Students can learn various SQL and PL/SQL commands, cursor and various application programs.
- To practice the concepts learnt in the subject DBMS by developing a database.
- To practice the designing, developing and querying a database.
- Working on existing database systems, designing of database, creating relational database,analysis of table design.
- How to organize, maintain and retrieve – efficiently and effectively information from a DBMS.

List of Exercises:

1. Creating, modifying and dropping Tables.
2. Inserting, modifying and deleting rows.
3. Working with Decode and case.
4. Creating tables with Adding , Dropping ,disabling /enabling constraints.
5. Retrieving rows with Character functions.
6. Retrieving rows with Number and Date functions.
7. Retrieving rows with Group functions and HAVING.
8. Retrieving rows with Sub Queries.
9. PL/SQL programs with control structures.
10. PL/SQL programs with Cursors.
11. PL/SQL programs with Exception Handling.
12. PL/SQL programs with Triggers.

Course Outcomes:

- Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models.
- Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity- Relationship Model.
- Design database schema considering normalization and relationships within database. Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML).
- Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.
- Learn to design Data base operations and implement using PL/SQL programs. Learn basics of PL/SQL and develop programs using Cursors, Exceptions

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-V / Discipline Specific Elective I(DSE I)	**1.Artificial Intelligence and Expert Systems**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To study about the basic concepts in Artificial intelligence and reasoning
- To know about knowledge representation and its subsequent inference
- To study the concept of expert systems
- To know about decision making and learning methods
- To study about concepts of expert systems.

UNIT	CONTENT	HOURS
UNIT I	Problems and Search : Searching strategies- Uninformed Search- breadth first search, depth first search, uniform cost search, depth limited search, iterative deepening search, bidirectional search - Informed Search- Best first search,Greedy Best first search , A* search – Constraint satisfaction problem , Local searching strategies.	9
UNIT II	Reasoning: Symbolic Reasoning Under Uncertainty- Statistical Reasoning - Weak Slot-And-Filler-Structure - Semantic nets – Frames- Strong Slot-And-Filler Structure- Conceptual Dependency-Scripts- CYC.	9
UNIT III	Knowledge Representation: Knowledge Representation - Knowledge representation issues - Using predicate logic - Representing Knowledge Using Rules. Syntactic- Semantic of Representation – Logic & slot and filler - Game Playing – Minimal search- Alpha beta cutoffs –Iterative deepening planning – component of planning system – Goal stack planning.	9
UNIT IV	Natural Language Processing**:** Natural Language Processing –Syntactic processing, semantic analysis-Parallel and Distributed AI-Psychological modeling-parallelism and distributed in reasoning systems – Learning Connectionist Models – Hopfield networks, neural networks	9
UNIT V	Expert Systems: Common Sense –qualitative physics, common sense ontologies- memory organization -Expert systems – Expert system shells- explanation – Knowledge acquisition - Perception and Action – Real time search- robot architecture.	9

Text Books:

1. Elaine Rich, Kevin Knight, "Artificial Intelligence", 3/e, Tata McGraw Hill,2017.
2. Russell , " Artificial intelligence :A modern Approach , Pearson Education ,3rd edition,2013
3. I. Gupta, G. Nagpal, "Artificial Intelligence and Expert Systems", MercuryLearning & Information, 2020.

Reference Books:

1. C.S. Krishnamoorthy, S. Rajeev, "Artificial Intelligence and Expert Systems forEngineers", CRC Press, 2018.
2. V. Daniel Hunt, "Artificial Intelligence & Expert Systems Sourcebook, SpringerUS, 2012.
3. Artificial Intelligence and Expert system by V.Daniel hunt, Springer press,2011.
4. Nilsson N.J., "Principles of Artificial Intelligence", Morgan Kaufmann.1998.

Course Outcomes:

Upon successful completion of this course the students would be able to:

- Understand the history of artificial intelligence (AI) and its foundations.
- Describe the modern view of AI as the study of agents that receive percepts from the Environment and perform actions.
- Demonstrate awareness of informed search and exploration methods.
- Create knowledge of decision making and learning methods
- Recall the concepts of expert systems.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-V / Discipline Specific Elective I (DSE I)	**2.Markup and Scripting Languages**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To understand Web based programming and scripting languages.
- To learn the basic web concepts and to create rich internet applications that use most recent client-side programming technologies.
- To prepare students for building scripts that control a sequence of program steps such as those used in developing testing and deploying software.
- To develop programming skills required to design internet applications.
- Emphasis is placed on programming techniques required to support internet applications.

UNIT	CONTENT	HOURS
UNIT I	HTML: HTML-Introduction-tag basics- page structure-adding comments working with texts, paragraphs and line break. Emphasizing test- heading and horizontal rules-list-font size, face and color-alignment links-tables-frames	9
UNIT II	Forms & Images Using Html: Graphics: Introduction-How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia, data collection with html forms textbox, password, list box, combo box, text area, tools for building web page front page	9
UNIT III	XML & DHTML: Cascading style sheet (CSS)-what is CSS-Why we use CSS-adding CSS to your web pages-Grouping styles-extensible markup language (XML). Dynamic HTML: Document object model (DCOM)-Accessing HTML & CSS through DCOM Dynamic content styles & positioning-Event bubbling-data binding.	9
UNIT IV	JavaScript: Client-side scripting, What is JavaScript, How to develop JavaScript, simple JavaScript, variables, functions, conditions, loops and repetition, Advance script, JavaScript and objects, JavaScript own objects, the DOM and web browser environments, forms and validations	9

UNIT V	Ajax: Introduction, advantages &disadvantages, Purpose of it, ajax based web application, alternatives of ajax Java Script & AJAX: Introduction to array-operators, making statements-date & time-mathematics strings-Event handling-form properties. AJAX. Introduction to jQuery and AngularJS.	9

Text Book:

1. Pankaj Sharma, "Web Technology", Sk Kataria & Sons Bangalore 2011.(UNIT I, II, III & IV).
2. Mike Mcgrath, "Java Script", Dream Tech Press 2006, 1st Edition. (UNIT V: JAVASCRIPT)
3. Achyut S Godbole & Atul Kahate, "Web Technologies", 2002, 2nd Edition. (UNIT V: AJAX)

Reference Books:

1. Laura Lemay, Rafe Colburn , Jennifer Kyrnin, "Mastering HTML, CSS & Javascript Web Publishing", 2016.
2. DT Editorial Services (Author), "HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)", Paperback 2016, 2nd Edition.

Web – Resources:

https://mrcet.com/downloads/digital_notes/IT/R17A1251%20ISL.pdf
https://www.jbiet.edu.in/coursefiles/cse/HO/cse4/SL1.pdf
https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_SL_Lecture_Notes.pdf

Course Outcomes:

- To learn the basics of HTML, DHTML, XML, CSS, Java Script and AJAX.
- Ability to Develop and publish Web pages using Hypertext Markup Language (HTML).
- Ability to optimize page styles and layout with Cascading Style Sheets (CSS).
- Ability to Understand, analyze and apply the role of languages to create a capstone
- Website using client-side web programming languages like HTML, DHTML, CSS, XML, JavaScript, and AJAX.

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester - V / Ability Enhancement Course II (AEC II)	**Python Programming Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- Describe the Strings, List, Tuples and Dictionaries in Python.
- Demonstrate the power of Numbers, Math functions in python
- It enriches the knowledge in programming techniques using pattern matching concepts
- It enables to understand object oriented programming concepts.
- Experiment Python scripting language to develop innovative real time Applications.

List of Practicals:

1. Exercises using conditionals and loops.
2. Exercises for implementing functions.
3. Exercises using list and their built-in functions.
4. Exercises by implementing tuples.
5. Exercises using apply ( ), filter ( ), map ( ) and reduce ( ) functions.
6. Exercises by implementing Modules
7. Exercises by implementing classes and instances
8. Exercises by illustrating regular expression
9. Exercises for implementing files concept.
10. Exercises using strings and their built-in functions.

Course Outcomes:

On the successful completion of the course, learners will be able to,

- Define the basic syntax and statements of Python programming, Syntax and idioms.
- Discuss the various decision making and construct statement of Python programming.
- Apply object oriented programming concept in real time problems.
- Illustrate pattern matching and extraction using regular expression.
- Demonstrate mapping using file concept

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-V **SSD**	**Soft Skill Development**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level
K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- Focusing on soft skills of teamwork.
- Inter-personal relationships.
- Conflict management
- Leadership quality.
- Responsibility.

UNIT	CONTENT	HOURS
UNIT I	KNOW THYSELF/UNDERSTANDING SELF Introduction to soft skills-Self discovery-Developing positive attitude – Improving perceptions – Forming values.	6 Hours
UNIT II	INTERPERSONAL SKILLS / UNDERSTANDING OTHERS Developing interpersonal relationships-Team building– Group dynamics- Networking-Improved work relationship.	6 Hours
UNIT III	COMMUNICATION SKILLS / COMMUNICATION WITH OTHERS Art of listening-Art of Reading- Art of Speaking-Art of Writing-Art of Writing E-Mail-E-Mail Etiquette.	6 Hours
UNIT IV	CORPORATE SKILLS / WORKING WITH OTHERS Developing Body Language-Practising Etiquette and Memorism –Time Management-Stress Management.	6 Hours
UNIT V	SELLING SELF/JOB HUNTING Writing Resume / CV-Interview Skills-Group Discussion-Mock Interview- Mock GD-Goal Setting- Career Planning.	6 Hours

Text Book:

1.A Book and Development Of Soft Skill Dr. K. Meena & Dr.V. Ayothi. Soft Skills-Dr. K. Alex & Chand Company.

Reference Books:

1. Developing the leader within you John C. Maxwell
2. Good to Great by Jim Collins.

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

- Resilience
- Communication.
- Emotional maturity.
- Confidence and enthusiasm for learning.
- Citizenship and Employability skills.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-V / Extra Credit Course V (VAC)	**Web Graphics(Theory and Practical)**	**Course Code:**
Instruction Hours:	**Credits: 2**	**Exam Hours: -**
Internal Marks :-	**External Marks:100**	**Total Marks: Grade**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To understand about the concepts of GIMP
- To offer the knowledge of creating and working with digital images .
- To manipulate them and to develop a presentation package using multimedia tools.
- To give an overall view of multimedia tools.
- To understand and differentiate text, image, video & audio.

Theory **Marks:60**

Unit I

Introduction to multimedia -GIMP: Environment - layers and work path -Image editing - channels, masks and actions - filters - rollovers and animations.

Unit II

Synfig: introduction - drawing and colouring tools.

Unit III

Synfig: animation - tweening - interactive elements.

List of Practicals: **Marks:40**

GIMP (Photoshop Equivalent)

1. Cropping images using Lasso Tools
2. Designing Pictures using Paint Tools
3. Designing Text using Text Tools
4. Applying Layer Effects to Images and Texts

Synfig (wiki.synfig.org / Category: Tutorials) (Flash equivalent)

1. Create an animation for bouncing a ball
2. Create brushed outlines for an image
3. Build a magnifying glass
4. Develop a slide show of photos with transitions

Aptana (http://content.aptana.com/aptana/tutorials/ **)(Dreamweaver equivalent)**

1. Developing a simple webpage with images and links
2. Develop a webpage displaying the timetable of the Department
3. Design an application form for Student Admission
4. Create your own web blog for college events

Course Outcomes:

On completion of the Course, learners should be able to

- To learn and understand technical aspect of Multimedia System
- Design and implement an animation for various themes.
- Prepare multimedia advertisement.
- Develop various Multimedia Systems applicable in real time.
- To develop multimedia application and analyze the performance of the same

Semester-VI / Core Course VIII (CC VIII)	**Dotnet Programming**	**Course Code:**
Instruction Hours: 5	**Credits: 5**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5Evaluate
K6-Create

Course Objectives:

- To provide the knowledge of Dot Net Frameworks along with ASP.Net and C#
- Set up a programming environment for ASP.net programs.
- Configure an asp.net application.
- Creating ASP.Net applications using standard .net controls.
- Develop a data driven web application.
- Connecting to data sources and managing them.

UNIT	CONTENT	HOURS
UNIT I	Introduction: Integrated Development Environment - IDE Components - Setting Environment Options - Building a Console application -Variable- Variable as Objects - Constants-Arrays.	15
UNIT II	Programming Fundamentals: Flow Control Statement-Writing & using procedures - Argument-Built-in Functions -The Textbox control -The List box, Checked List Box and Combo Box Controls-The Scrollbar or Track bar controls.	15
UNIT III	Working with Forms: Appearance of Forms - Loading or showing Forms - Dynamic Forms -Designing Menus - Common Dialog controls - Rich Text box Control –List view, Tree view, or Image List Controls - Handling Strings or Characters - Handling Dates or Times - Manipulating Folders or Files -Accessing Files.	15
UNIT IV	ADO .Net: The Basic Data - Access Classes-storing Data in datasets - Update Operations -Working with Typed Datasets - Data Binding - Designing Data Driven Interfaces.	15
UNIT V	Building Web Applications: Understanding HTML or DHTML- working with HTML - Cascading Style Sheets - Server Side Technologies – Controls - ASP.Net Objects - Understanding Web Services.	15

Text Book:

1. Evangelos Petroutsos, Mastering Microsoft Visual Basic 2008, Wiley India Edition, Wiley Reprint, 2009.
2. Mathew MacDonald, "ASP.NET: The Complete Reference", Tata McGraw Hill Ltd., New Delhi,2017.

Reference Book:

1. Dr. C. Muthu, "ASP.NET", Shalom InfoTech Pvt. Ltd., 2011.

Web-Resources:

http://sigc.edu/department/computerscience/studymet/AdvancedASP.NET.pdf

http://www.mentorum.nl/docs/Traindocs/dotNET_Tutorial_for_Beginners.pdf

Course Outcomes:

On completion of the Course, Students should be able to do

- Understand the fundamental concepts of .NET frame work.
- Discuss the use of various web controls and rich controls
- Infer State Management techniques in asp.net web pages
- Discuss and extend data list and data grid controls
- Demonstrate the database connectivity in ASP.NET

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	M	S	S	S	S	S	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	M	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-VI / Core Course IX (CC IX)	**Operating Systems**	**Course Code:**
Instruction : 5	**Credits: 5**	**Exam : 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5Evaluate
K6-Create

Course Objectives:

- To gain the basic knowledge about the operating systems and its various schemes and services.
- To make students able to learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.
- To provide students knowledge of memory management and deadlock handling algorithms
- To make aware of different types of operating system and their services.
- To know virtual memory concepts and learn secondary memory management.

UNIT	CONTENT	HOURS
UNIT I	INTRODUCTION : Meaning – Early Systems - Multiprogrammed Batch Systems – Real-Time Systems. Computer System Structures: Computer-System Operation - Storage Hierarchy - General System Architecture. Operating System Structures:System Components - System Calls - Virtual Machines - System Generation.	15
UNIT II	PROCESS MANAGEMENT: Processes - Process Concept - Operation on Processes- Inter-Process Communication. CPU Scheduling: Basic Concepts - Scheduling Algorithms - Real Time Scheduling. Process Synchronization: Background - Critical- Selection Problem –Semaphores. Deadlocks: System Model - Methods for Handling Deadlocks - Deadlock Avoidance - Recovery from Deadlock.	15
UNIT III	MEMORY MANAGEMENT: Background - Swapping - Paging - Segmentation with Paging. Virtual Memory: Demand Paging – Page Replacement - Allocation of Frames – Thrashing.	15

UNIT IV	File Concept - Access Methods – Directory Structures File-System Implementation: File-system Structure – Allocation Methods - Directory Implementation - Efficiency and Performance FILE - SYSTEM INTERFACE: File Concept - Access Methods – Directory Structures File-System Implementation: File-system Structure – Allocation Methods - Directory Implementation - Efficiency and Performance - Recovery. MASS STORAGE STRUCTURE: Disk Structure - Disk Scheduling - Swap-Space Management - Stable-Storage Implementation.	15
UNIT V	PROTECTION:Goals of Protection - Access Matrix - Capability Based Systems - Language-based Protection. Security: The Security Problem - Authentication - Security Systems and Facilities - Encryption. Distributed Systems: Distributed System Structures: Background – Distribution Coordination: Mutual Exclusion- Atomicity –Concurrency Control – Deadlock Handling- Election Algorithms.	15

Text Book:

Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 9th Ed., John Wiley & Sons Inc., New Delhi 2013.

Reference Books :

1. Harvey M. Deitel, "An Introduction to Operating System", 3rd ed., Addison Wesley, New York, 2003.
2. Andrew S. Tanenbaum, "Modern Operating Systems", 4th ed., Prentice Hall, New Delhi, 2014.

Web-Resources:

http://www.svecw.edu.in/Docs%5CCSEOSLNotes2013.pdf

http://www.crectirupati.com/sites/default/files/lecture_notes/Operating%20Systems%20Lecture%20Notes.pdf

Course Outcomes:

On completion of the Course, the learner will be able to

- Understand the basic concept of Computer System and Operating System Structure
- Gain Knowledge of the fundamental aspects of process and processor managements with deadlocks and CPU scheduling
- Introduce memory and virtual memory techniques
- Understand files, directories and its accessing methods and its structures
- Ability to know mass storage devices and its scheduling

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-VI / Core Course X(CC X)	**Computer Graphics**	**Course Code:**
Instruction Hours: 5	**Credits: 4**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level
K1 -Recalling
K2 -Understanding
K3 -Applying
K4 - Analyzing
K5 - Evaluating
K6 - Creating

Course Objectives:

- To impart the basic principles of generating primitives, shapes, package development, interactive graphics, raster graphics, two and three dimensional graphics and their transformations.
- To provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations.
- To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.
- The computer graphics course prepares students for activities involving in design, development and testing of modeling, rendering, shading and animation.

UNIT	CONTENT	HOURS
UNIT I	Basic Concepts:- Introduction – Uses of computer graphics – Display devices -, CRT, Color CRT monitors – Inherent memory devices – Direct view storage tube – Flat panel displays–Three dimensional viewing devices, Raster scan system, Random scan system, aspect ratio.	15
UNIT II	Line drawing algorithm – Simple DDA – Bresenham's line drawing algorithm – circle generation. Two-dimensional transformations: Basic transformations, Matrix representation - Composite transformation of translation, rotation, scaling – Pivot,point rotation – fixed point scaling, other transformation.	15
UNIT III	Clipping and Windowing: Point clipping –Line clipping – Sutherland – Liang Barsky - Hodgeman polygon clipping – Text clipping – Viewing transformation – Windowing transformation.	15
UNIT IV	Graphical input devices: – Pointing and Positioning – keyboard, mouse, trackball, joystick, scanner, light pens, and tables. Three-dimensional input devices: - printers and plotters.Three- dimensional concepts: - Three dimensional display methods – Three- dimensional transformation – translation, rotation, scaling – Three dimensional viewing – Viewing pipeline – Viewing coordinates –Projections.	15
UNIT V	Hidden surface removal - Object space methods – Back face detection method – Painter's algorithm – Image space methods – Area subdivision – Octree – Depth – buffer – Scan line – Ray tracing, Surface renderings – Surface textures – Shading	15

Text book

Computer Graphics – C Version, Donald Hearn & M. Pauline Baker, Pearson Education, 2nd Edition,2013

Reference Book

1. Geometric Tools for Computer Graphics, Philip J. Schneider, David H. Eberly, Morgan Kaufmann Publishers, 2005
2. Principles of Interactive Computer Graphics, William M.Newman,Robert F. Sproull, Tata McGrawHill, 2nd Edition,2002

E-Resources:

http://www.svecw.edu.in/Docs%5CCSECGLNotes2013.pdf
https://drive.google.com/file/d/1st2YSA6l3KoCGiNxFmSAXHMbCdxEHN9i/view

Course Outcomes:

On completion of the Course, Students should be able to do

- Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
- Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
- Use of geometric transformations on graphics objects and their application in composite form.
- Extract scene with different clipping methods and its transformation to graphics display device.
- Understand the graphical input devices.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	2	3	4	5	1	2	3	4	5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	M	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M - Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-VI / Core Course XI(CC XI)	**Project**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To provide basic knowledge of the real time projects of the IT industry. To develop mini real time software's using any platforms such as C, C++, Java, VB, Dotnet, C#, ASP.net,VB.net, Android, iOS, Linux, Python, etc.
- To Identify Project scope, Objectives and Infrastructure.
- To Develop Activity diagram and Class diagram
- To Develop Sequence diagrams and Collaboration Diagram
- To add interface to class diagram

Course Outcomes:

On completion of the Course, learners should be able to

- Able to elicit, analyze and specify software requirements.
- Plan a software engineering process life cycle.
- Realize design practically, using an appropriate software engineering methodology
- Analyze and translate a specification into a design.
- Able to use modern engineering tools for specification, design, implementation, and testing
- Effectively designs basic and advanced SQL queries to retrieve data from the database.

Semester-VI / Discipline Specific Elective –II (DSE II)	**1.E-COMMERCE**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To expand the customer reach
- To reduce the cost-to-serve
- To create differentiated customer experiences
- To describe the business-to-business (B2B) companies.
- To describe the Reengineering concepts for Ecommerce.

UNITS	CONTENTS	HOURS
UNIT I	Welcome to electronic commerce: Electronic Commerce – Type of Electronic Commerce Solutions – Electronic data Interchange – Major Projects in Electronic Communication – Electronic Payments – Applications	09
UNIT II	Electronic Communication: Data Communication – Forms of Data Communication – Data Transmission Techniques – Types of Communication Channels – Methods of Data Transmission – Transmission Modes – Introduction to FDM, TDM, ISDN, and ATM – Definition for LAN, MAN, and WAN – An introduction to Network Topology – Private. Value added, public, Circuit switching and packet – switching Networks.	09
UNIT III	TCP/IP and Network Security: Introduction – Architecture of TCP/IP – Applications of TCP/IP – Security in Introduction to internet, intranet and extranet.	09
UNIT IV	Technologies of electronic Commerce: Introduction – Electronic Data interchange – Uses- Evolution of EDI – Benefits of EDI and X.400 – Business features of EDI – EDI Administration – EDI security – Security Mechanisms.	09

UNIT V	Reengineering for Electronic Commerce: An introduction to enterprise Resource Planning – Evolution and Characteristics of ERP – Features of ERP – components of ERP – ERP Vendors – Business process Reengineering – The future of ERP System – Information Technology plan for ERP system.	09

Text Books:

1.Doing Business on the Internet E-COMMERCE, By S. Jasiwal, 1st Edition 2000, Galgotia Publications.

Reference Books

1.Electronic commerce, By Gary O. Schneider James T. Perry, 1st Edition 2000, Thomson Learning

Web resources:

https://www.gasckovilpatti.com/studymaterial/commerce/II%20MCOM%20E%20COMMERCE%20pKCM33.pdf
https://www.vssut.ac.in/lecture_notes/lecture1428551057.pdf

https://irp-cdn.multiscreensite.com/1c74f035/files/uploaded/introduction-to-e- commerce.pdf
https://www.london.ac.uk/sites/default/files/study-guides/electronic-commerce.pdf

Course Outcomes:

On completion of the Course, Students should be able to do

- Identify the component parts of e-commerce
- Identify the benefits of selling online
- Know how to optimise and stay safe when selling online
- Have an outline strategy for e-Commerce for your business
- Understand the risks around Cyber Security when trading and doing business online.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	M	S	S	S	S	S
CO3	S	M	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	M	S	S	M	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-VI / Discipline Specific Elective II(DSE II)	**2.NETWORK SECURITY**	**Course Code:**
Instruction Hours: 3	**Credits: 3**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

Knowledge Level

K1-Acquire/ Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- Understand various block cipher and stream cipher models
- Describe the principles of public key cryptosystems, hash functions and digital signature
- To get a firm knowledge on Cyber Security Essentials
- To understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through software / tools.
- To compare and contrast symmetric and asymmetric encryption systems and their vulnerability to attack.

UNITS	CONTENTS	HOURS
UNIT I	Model of network security – Security attacks, services and attacks – OSI security architecture – Classical encryption techniques – SDES – Block cipher Principles DES – Strength of DES – Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – RC4 - Differential and linear cryptanalysis – Placement of encryption function – traffic confidentiality.	09
UNIT II	Number Theory – Prime number – Modular arithmetic – Euclid's algorithm - Fermet's and Euler's theorem – Primality – Chinese remainder theorem – Discrete logarithm – Public key cryptography and RSA – Key distribution – Key management – Diffie Hellman key exchange – Elliptic curve cryptography.	09
UNIT III	Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA - HMAC – CMAC - Digital signature and authentication protocols- DSS.	09

UNIT IV	Authentication applications – Kerberos – X.509 Authentication services - E- mail security – IP security - Web security.	09
UNIT V	Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security.	09

Text Books:

. 1. William Stallings, "Cryptography and Network Security", Pearson Education, 6th Edition,2013.

2. Charles P. Pfleeger Shari Lawrence Pfleeger Jonathan Margulies, Security in Computing, 5th Edition , Pearson Education , 2015.

Reference Books

1. Graham, J. Howard, R., Olson, R., Cyber Security Essentials, CRC Press, 2011.
2. George K.Kostopoulous, Cyber Space and Cyber Security, CRC Press, 2013.

Web resources:

https://www.vssut.ac.in/lecture_notes/lecture1428550736.pdf
https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SCS1316.pdf
https://kanchiuniv.ac.in/coursematerials/Cryptography_Network%20Security%20Dr_K_Anitha.pdf

Course Outcomes:

- Implement basic security algorithms required by any computing system
- Analyze the vulnerabilities in any computing system and hence be able to design a security solution
- Analyze the possible security attacks in complex real time systems and their effective countermeasures
- Differentiate various governing bodies of cyber laws
- Impart various privacy policies for an organization

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	M	S	S	S	S	S
CO3	S	M	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	M	S	S	M	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-VI / Discipline Specific Elective III (DSE III)	**1.Dotnet Programming Lab**	**Course Code:**
Instruction Hours: 4	**Credits: 3**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire/Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objectives:

- To enable the students to learn the fundamental concepts of ASP.NET.
- Maintain session and controls related information for user used in multi-user web applications
- Understand the fundamentals of developing modular application by using object oriented methodologies
- Use AJAX to create partial-page updates that refresh only the parts of the Web page that have changed.
- Connecting to data sources and managing them.

List of Practical's:

1. Form Design using Various Web Controls
2. Ad Rotator
3. Calendar Control
4. Login Control
5. Validation Controls
6. Cookie Manipulation
7. State Management (using Session and Application)
8. Data Retrieval, Updating using ADO.NET (using Stored Procedure)
9. Template Creation using Data List
10. Sorting and Paging using Data Grid

Course Outcomes:

On completion of the Course, Students should be able to do

- Design forms using various web controls
- Apply rich controls and validation controls to the web page
- Illustrate cookies, session and application state in a web page Create and manipulate the data in the database using ADO.NET.
- Create a template using data list and data grid
- Build an application using XML

Mapping of Cos with Pos & PSOs:

CO/PO	**PO**					**PSO**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlation

Semester-VI / Discipline Specific Elective III (DSE III)	**2.Latex Lab**	**Course Code:**
Instruction Hours: 4	**Credits: 3**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-**Acquire/ Remember**	K2-**Understanding**	K3-**Apply**	K4-**Analyze**	K5-**Evaluate**	K6-**Create**

Course Objectives:

- To introduce students with a software that is being widely used for typesetting e specially in Mathematics field.
- To make students know importance of this software for publishing research articles, papers
- Project reports and books and thereby help them to be comfortable with the software .
- To include figures and tables in a Latex document.
- To make conference proceedings and presentations.

List of Practicals:

1. Building a Latex document
2. Previewing first.tex
3. Addition of some text in the.tex file
4. Finding the error and fixing it
5. A centered graph with a caption
6. Two figures next to each other
7. Formation of table
8. Cross references
9. Citation
10. Bibliography
11. Typesetting with a new chapter heading
12. List of figures
13. List of tables
14. Generating index
15. Printing your document

Course Outcomes:
On completion of the Course, the students will be able to

- Student knows history of Latex
- Students to install Latex software.
- Student learns to write equations, matrix and tables
- Student learns to quote the references, equation references, citations.
- Student lists the figures, tables and generating index.

Semester-III **Skill Enhancement Course IV (SEC IV)**	**Linux Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-**Acquire/ Remember**	K2-**Understanding**	K3-**Apply**	K4-**Analyze**	K5-**Evaluate**	K6-**Create**

Course Objectives:

- To provide introduction to UNIX Operating System and its File System
- To gain an understanding of important aspects related to the SHELL and the process
- To develop the ability to formulate regular expressions and use them for pattern matching.
- To provide a comprehensive introduction to SHELL programming.
- To provide services and utilities of SHELL programming

List of Practicals:

1. Write a menu driven shell program for the following.
   - Listing of files.
   - Processes of users.
   - Today's Date
   - Quit from UNIX
2. Write a shell program which accepts the name of a file from the Standard input and tests to find the file access permissions, Such as read, write and execute.
3. Write a shell program which accepts the name of a file from the Standard input and then performs the following.
   a. Accept five names in a file
   b. Sorts the names in existing file
   c. Lists unsorted and sorted file
   d. Quits.
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. Write sentence in file
   b. Search for a given word or pattern in a existing file,
   c. Quits.
6. Write a shell program to prepare electric bill for domestic consumers Rates:
   For first 100 units – Rs. 0.75/Unit
   For next 100 units – Rs. 1.50/Unit
   Above 200 units - Rs. 3.00/Unit
   Prepare the bill in a neat format.
7. Write a shell program to display the result PASS or FAIL using the Information given below:
   Student Name, Student Reg.No, Mark1, Mark2, Mark3, Mark4.
   The minimum pass for each subject is 50.
8. Merge the contents of the field file1, file2 and store in another file.
9. Display the list of last files present in the current directory. Also Display this list in a file profile.

Course Outcomes:

- Describe the architecture and features of UNIX Operating System and distinguish it from other Operating System
- Demonstrate UNIX commands for file handling and process control
- Write Regular expressions for pattern matching
- Apply them to various filters for a specific task
- Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem

Semester-VI / Ability Enhancement Course III(AEC III)	**Computer Graphics And Animation Lab**	**Course Code:**
Instruction Hours: 2	**Credits: 2**	**Exam Hours: 3**
Internal Marks :40	**External Marks:60**	**Total Marks: 100**

Knowledge Level

K1-Acquire / Remember	K2-Understanding	K3-Apply	K4-Analyze	K5-Evaluate	K6-Create

Course Objective :

- Understand and apply the various predefined functions for drawing various geometric shapes
- Apply the concepts of Cropping, Rotating and overlapping.
- Develop a commercial brochure
- To Create the image with multi layers.
- Understand the concepts of masks

Photoshop :

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
(ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

Flash :

Develop an image(s) and do the following.

1. Basic Drawing and Painting
2. Working with Strokes and Fills
3. Creating Custom Colors, Gradients, and Line Styles Transforming and Grouping Objects
4. Creating and Managing Multiple Layers
5. Converting Text into Shapes
6. Animate using motion, shape, Tweening, and actions

Course outcomes:

On completion of the Course, the students will be able to

- Apply the drawing concepts using images.
- Developed the image using real life images.
- Design using Strokes and fills.
- Build a multi layered images.
- Apply motion, shape and tweening

Semester-VI /GS	**GENDER STUDIES**	**Course Code:**
Instruction Hours: 1	**Credits: 1**	**Exam Hours: 3**
Internal Marks :25	**External Marks:75**	**Total Marks: 100**

COURSE OBJECTIVES:

- To make students to aware of Gender constructions and gendering Process
- To explore existing gender biases in the society and to understand the need to work towards the inclusive society
- To inculcate sensitivity and build gender perspectives.
- To use the course to bring attitudinal cum behavioral changes towards gender neutralambience and promote the humanistic values

UNITS	CONTENTS	HOURS
UNIT I	**INTRODUCTION TO GENDER STUDIES CONCEPTS** Gender Spectrum.-Sex – Gender distinction – Biological Determinism – Patriarchy – Feminism –Gender Socialization and Stereotyping- Gender Discrimination – Gender Division of labourand roles– Gender Sensitivity and awareness – Gender Equity – Equality – Gender Main streaming and Gender Analysis.	3
UNIT II	**UGC INITIATIVES ON WOMEN'S STUDIES** Definition of Women's Studies –Gender Studies –UGC Initiatives and guidelines on Women's Studies - Beijing Conference, UN Initiatives – Convention on Elimination of All forms of Discrimination Against Women (CEDAW)- Sustainable Development Goals on Gender Equality (SDG 5) and targets	3
UNIT III	**AREAS OF GENDER DISCRIMINATION** Gender Socialization- Sex Ratio– Health and Nutrition– – Literacy and Education - Employment- Governance – participation in decision making- politics- property rights and access to credit- gender based violence- Social institutions – Family, Caste, Class, religion, gender, State. Market – Media – Politics – Judiciary	3
UNIT IV	**WOMEN DEVELOPMENT AND GENDER EMPOWERMENT** Towards Equality Report of Status of Women in India 1974 – International Women's Decade – International Women's Year – National Policy for Empowerment of Women 2001	3

UNIT V	**WOMEN'S MOVEMENTS AND SAFEGUARDING MECHANISM :** In India National /State Commission for Women(NCW) – All Women Police Station – Family Court Legislations safeguarding women –Transgender Policy—Constitutional amendments for women's political participation	3
UNIT VI	**CURRENT CONTOURS: (for continuous internal assessment only):** Tamil Nadu State Policy for Women 2021- National Policy for Women 2015 – Prevention of Sexual Harassment at Work places Act 2013- Protection of Children from Sexual Offences Act, 2012 - Analysis of regressive and progressive High court and supreme court judgments- women proactive policies, programmes, interventions	3

REFERENCE :

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited ,2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited,2004
3. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited,1993
4. Arya Sadhna Women ,Gender Equality and the State ,New Delhi :Deep &Deep Publication,2000
5. Mishra .O.P,Law Relating to Women &Child ,Allahabad :Central Law Agency 2001
6. Uma Chakravarti, Gendering Caste Through a Feminist Lens, Sage Publication 2003
7. Bhattacharya Malini , Sexual Violence and Law ,Kolkata; West Bengala Commission forWomen ,2002
8. Sexual Harassment at the Workplace – A Guide , New Delhi ;Sakshi,1999
9. https://www.schooloflegaleducation.com/women-and-law-in-india-e-book/

Semester-V / Extra Credit Courses VI (VAC II)	**Full Stack Development**	**Course Code:**
Instruction Hours:	**Credits: 2**	**Exam Hours: -**
Internal Marks :-	**External Marks:-100**	**Total Marks: Grade**

Knowledge Level

K1-Acquire/ Remember
K2-Understanding
K3-Apply
K4-Analyze
K5-Evaluate
K6-Create

Course Objectives:

- To become knowledgeable about the most recent web development technologies.
- Idea for creating two tier and three tier architectural web applications.
- Design and Analyse real time web applications.
- Constructing suitable client and server side applications.
- To learn core concept of both front end and back end programming**.**

UNIT	CONTENT	HOURS
UNIT I	Web Development Basics: Web development Basics-HTML & Web servers Shell- UNIXCLI Version control - Git & Github HTML, CSS	-
UNIT II	Frontend Development: Javascript basics OOPS Aspects of JavaScript Memory usage and Functions in JS AJAX for data exchange with server jQuery Framework jQuery events, UI components etc. JSON data format.	-
UNIT III	REACTJS: Introduction to React React Router and SinglePage Applications React Forms, Flow Architecture and Introduction to Redux More Redux and Client-Server Communication	-
UNIT IV	Java Web Development: JAVA PROGRAMMING BASICS, Model View Controller(MVC) Pattern MVC Architecture using Spring REST ful API using Spring Framework Building an application using Maven	-
UNIT V	Databases & Deployment: Relational schemas and normalization Structured Query Language(SQL) Data persistence using Spring JDBC Agile development principles and deploying application in Cloud	-

Text Book:

1. WebDesignwithHTML,CSS,JavaScript andJQuery Set Book by JonDuckettProfessionalJavaScr Web Developers Book byNicholas C. Zakas
2. LearningPHP,MySQL,JavaScript,CSS&HTML5:AStep-by-StepGuidetoCreatingDynamic Websites by Robin Nixon
3. Full Stack JavaScript: Learn Backbone.js, Node.js and MongoDB. Copyright © 2015 BYAZAT MARDAN

Reference Books:

1. Full-Stack JavaScript Development by Eric Bush.
2. Mastering Full Stack React Web Development Paper back–April 28, 2017 by Tomasz Dyl ,Kamil Przeorski , Maciej Czarnecki

COURSE OUT COMES:

- Develop a fully functioning website and deploy on a web server.
- Gain Knowledge about the front end and back end Tools
- Find and use code packages based on their documentation to produce working results in a project.
- Create web pages that function using external data.
- Implementation of web application employing efficient database access.

Mapping of Cos with Pos & PSOs:

CO/PO	PO					PSO				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

S - Strongly Correlated
M-Moderately Correlated
W-Weakly Correlated
N – No Correlated