DEPARTMENT OF COMPUTER SCIENCE

OUTCOME BASED EDUCATION SYLLABUS
(Choice Based Credit System)

THREE YEARS B.Sc. COMPUTER SCIENCE PROGRAMME

2018 - 2019 BATCH ONWARDS

DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE

(AUTONOMOUS)

College with Potential for Excellence

Linguistic Minority Institution affiliated to University of Madras

E.V.R. PERIYAR HIGH ROAD,

ARUMBAKKAM, CHENNAI – 600106, TAMILNADU.

CONTENTS **PAGE NO.**

1. Vision, Mission and Program Educational Objectives (PEO) 01
2. Program Outcomes (PO) 01
3. Mapping of POs with PEOs 02

SCHEME

4. Scheme of First Semester 03
5. Scheme of Second Semester 05
6. Scheme of Third Semester 06
7. Scheme of Fourth Semester 07
8. Scheme of Fifth Semester 08
9. Scheme of Sixth Semester 09

SYLLABUS

10. Syllabus of First Semester

a) Language Paper I
b) English Paper I
c) Computer Fundamentals
d) Digital Electronics and Microprocessor
e) Digital Electronics and Microprocessor Lab
f) Mathematics I
g) NME I – Fundamentals of Information Technology
h) Soft Skills

11. Syllabus of Second Semester

a) Language Paper II
b) English Paper II
c) Object Oriented Programming Using C++
d) Paper IV – Data Structures
e) Practical I -OOPS and Data Structures Lab
f) Mathematics - II
g) NME II – HTML and Web Design
h) Soft Skills

12. Syllabus of Third Semester

a) Language Paper III
b) English Paper III

c) Programming in Java
d) Web Design
e) Java and Web Design lab
f) Mathematics - III
g) Soft Skills

13. Syllabus of Fourth Semester

a) Language Paper IV
b) English Paper IV
c) Visual Programming
d) Core Elective I
   - Computer Networks
   - Client –Server Technology
   - Artificial Intelligence and Expert Systems

e) Visual Programming Lab
f) Mathematics - IV
g) Soft Skills
h) Environmental Studies

14. Syllabus of Fifth Semester

a) Operating Systems
b) Database Management Systems
c) Computer Graphics
d) Core Elective II
   - ASP. Net Programming
   - Advanced Java Programming
   - Multimedia

e) RDBMS Lab
f) Lab Based on Elective II
g) Value Education

15. Syllabus of Sixth Semester

a) Programming in PHP
b) Python Programming
c) Software Engineering
d) Core Elective III

   - Data mining
   - Digital Image Processing
   - Unified Modeling Language

e) PHP and Python Programming Lab
f) Mini Project
g) Extension Activities

VISION

To achieve Excellency in academics by rigorous value-based education and outstanding teaching practices.

MISSION

M1	To organize seminars, Guest-Lectures and symposiums for the benefit of the students to acquire knowledge on recent trends.
M2	To enable the students to be industry ready by developing state-of-the-art curriculum in tune with industry requirements.
M3	To develop young minds with active and creativeness for improving their skill-sets needed for enriched career development along with imbibing high moral values in them.
M4	To make students to understand the concepts using innovative teaching materials.

PROGRAMME EDUCATIONAL OUTCOMES (PEOs)

PEO1	To progress their career productively in software industry, academia, research, entrepreneurial pursuit, government, consulting firms and other Information Technology enabled services.
PEO2	To achieve peer-recognition; as an individual or in a team; by adopting ethics and professionalism and communicate effectively to excel well in cross culture and inter-disciplinary teams.
PEO3	To continue a lifelong professional development in computing that contributes in self and societal growth.

PEO TO MISSION STATEMENT MAPPING

MISSION STATEMENTS	PEO1	PEO2	PEO3
M1	3	2	2
M2	3	3	2
M3	3	3	3
M4	3	2	3

CORRELATION: 3- STRONG 2- MEDIUM 1- LOW

PROGRAMME OUTCOMES [Pos] FOR UNDER GRADUATE

At the end of the UG Programme, the student will be able:

PO1	To participate in various types of employment, development activities and public discourses particularly in response to the needs of the community one serves.
PO2	To implement discipline, professionalism, team spirit, communication skills, social and ethical commitment in the under graduates in order to embellish leadership roles expediting perfection in different sector with a categorical professional distinctiveness, business savvy, international recognition and imperishable expansion.
PO3	To improve the problem-solving skill to identify possible solutions and choosing the correct solution for any problem.
PO4	To enhance the competencies to support national, regional and local development plans and to create questioning mind.
PO5	To enhance the critical thinking ability to think clearly and rationally while understanding the logical connection between ideas in a reflective and independent thinking.
PO6	To engage in Lifelong learning and enduring proficient progress.

MAPPING OF POs TO PEOS

PEO/PO	PO1	PO2	PO3	PO4	PO5	PO6
PEO 1	3	3	2	3	3	3
PEO 2	2	3	2	3	3	3
PEO 3	3	3	3	3	2	3

CORRELATION: 3- STRONG 2- MEDIUM 1- LOW

PROGRAMME SPECIFIC OUTCOMES [PSOs] FOR B.SC COMPUTER SCIENCE

PSO1	Learning the applications of various software elements which help to identify various analysis and design methodologies
PSO2	Demonstrate by developing computer programs in the area related to algorithm, web designing, facilitating efficient design for complex problems.
PSO3	Enables the students to be familiar with the modern- day issues, latest trends in computing and technology and create ideas and solutions to existing problems
PSO4	Building code in Various Programming Languages and applications
PSO5	Detailed Glimpse of Orientation and Interconnection.
PSO6	Gains Knowledge in the various aspects of new Trends and Technologies.

ASSESSMENT PATTERN

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; **K2**- Understand; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate; **K6**-Create;

1. THEORYEXAMINATION

CIA- Continuous Internal Assessment (40 Marks) Test – I & II: 25 Marks (Theory)

Bloom's Category	Section	Description	Marks	Total
K1, K2	A-10 x 1 Mark [MCQ/Short answers]	Choose/Fill ups/One word	10	**50**
K3, K4, K5, K6	B-4 out of 6 x 10 Marks	250 Words	40	

Components of Continuous Internal Assessment (CIA)

Components			Calculation	CIA Total
Test	I	50	(Test1 + Test2) / 4 = 25	**40**
	II	50		
Generic Skills (Group discussion/Real time Project work/Seminar/ Poster Presentation)			10	
Attendance			05	

ESE- Semester End Examination (100 Marks; Weightage is 60%)

Bloom's Category	Section	Description	Marks	Total
K1, K2, K3, K4	A – 5 out of 8 x 5 Marks	250 Words	25	**100**
K3, K4, K5, K6	B– 5 (Either or pattern) x 15 Marks	500 Words	75	

2. PRACTICAL EXAMINATION (100Marks)

Bloom's Category	CIA	ESE		Total
	Lab Performance	Lab Performance	Record Work	
K3, K4, K5, K6	40	50	10	**100**

DEPARTMENT OF COMPUTER SCIENCE

SCHEME OF I SEMESTER B.SC COMPUTER SCIENCE PROGRAMME

Sl. No.	Course Category	Course Code	Course	Credit Distribution				Over all Credits	Total Contact Hours/ Week	Marks		
				L	T	P	S			CIA	ESE	Total
1	Language PI	1816101	Language Paper I	4	0	0	0	3	4	40	60	100
2	English PI	1899101	English Paper I	4	0	0	0	3	4	40	60	100
3	Core Theory TI	1815101	Computer Fundamentals	4	0	0	0	3	4	40	60	100
4	Core Theory T II	1815102	Digital Electronics and Microprocessor	3	1	0	0	3	4	40	60	100
5	Core Practical PI	1815104	Digital Electronics and Microprocessor Lab	0	0	4	0	2	4	40	60	100
6	Allied Paper PI	1808108	Mathematics – I	6	0	0	0	5	6	40	60	100
7	Non-Major Elective I	2015103	NON-MAJOR ELECTIVE a) Those who have studied Tamil up to XII Std. shall take either Fundamentals of Information Technology or Advanced Tamil. b) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take	2	0	0	0	2	2	40	60	100

			Tamil comprising of two courses (level will be at 6th Standard).									
8	Soft Skills*	1840101	SOFT SKILLS *	2	0	0	0	3	2	40	60	100
			Total	25	1	4	-	**24**	**30**	**320**	**480**	**800**

CIA-Continuous Internal Assessment

ESE-End Semester Examination

English and Soft Skills*- Syllabus framed and approved by English Department.

Language - Syllabus framed and approved by Language Departments.

DEPARTMENT OF COMPUTER SCIENCE

SCHEME OF II SEMESTER B.SC COMPUTER SCIENCE PROGRAMME

Sl. No.	Course Category	Course Code	Course	Credit Distribution				Over all Credits	Total Contact Hours/ Week	Marks		
				L	T	P	S			CIA	ESE	Total
1	Language P II	1816204	Language Paper II	4	0	0	0	3	4	40	60	100
2	English P II	1899202	English Paper II	4	0	0	0	3	4	40	60	100
3	Core Theory TIII	1815205	Object Oriented Programming Using C++	3	1	0	0	3	4	40	60	100
4	Core Theory T IV	1815206	Data Structures	3	1	0	0	3	4	40	60	100
5	Core Practical P II	1815208	OOPS and Data Structures Lab	0	0	4	0	2	4	40	60	100
6	Allied paper P II	1808215	Mathematics - II	6	0	0	0	5	6	40	60	100
7	Non-Major Elective II	2015207	PART-IV NON-MAJOR ELECTIVE a) Those who have studied Tamil up to XII Std. shall take either HTML AND WEB DESIGN or Advanced Tamil. b) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard).	2	0	0	0	2	2	40	60	100
8	Soft skills*	1840201	Soft skills *	2	0	0	0	3	2	40	60	100
			Total	24	2	4	-	**24**	**30**	**320**	**480**	**800**

CIA-Continuous Internal Assessment

ESE-End Semester Examination

English and Soft Skills*- Syllabus framed and approved by English Department.

Language - Syllabus framed and approved by Language Departments.

DEPARTMENT OF COMPUTER SCIENCE

SCHEME OF III SEMESTER B.SC COMPUTER SCIENCE PROGRAMME

Sl. No.	Course Category	Course Code	Course	Credit Distribution				Over all Credits	Total Contact Hours/ Week	Marks		
				L	T	P	S			CIA	ESE	Total
1	Language P III	1816307	Language Paper III	6	0	0	0	3	6	40	60	100
2	English P III	1899303	English Paper III	4	0	0	0	3	4	40	60	100
3	Core Theory T V	1815309	Java Programming	3	1	0	0	3	4	40	60	100
4	Core Theory VI	1815310	Web Design	3	1	0	0	3	4	40	60	100
5	Core Practical P III	1815311	Java and Web Design lab	0	0	4	0	2	4	40	60	100
6	Allied Paper PIII	1808320	Mathematics - III	6	0	0	0	5	6	40	60	100
7	Soft Skill	1840301	Soft Skills **	2	0	0	0	3	2	40	60	100
			Total	24	2	4	-	**22**	**30**	**280**	**420**	**700**

CIA-Continuous Internal Assessment

ESE-End Semester Examination

English and Soft Skills*- Syllabus framed and approved by English Department.

Language - Syllabus framed and approved by Language Departments.

DEPARTMENT OF COMPUTER SCIENCE

SCHEME OF IV SEMESTER B.SC COMPUTER SCIENCE PROGRAMME

Sl. No.	Course Category	Course Code	Course	Credit Distribution				Over all Credits	Total Contact Hours/ Week	Marks		
				L	T	P	S			CIA	ESE	Total
1	Language P IV	1816408	Language Paper IV	6	0	0	0	3	6	40	60	100
2	English P IV	1899404	English Paper IV	4	0	0	0	3	4	40	60	100
3	Core Theory T VII	1815412	Visual Programming	2	1	0	0	3	3	40	60	100
4	Core Theory Elective I	1815413	Computer Networks / Client –Server Technology/ Artificial Intelligence and Expert Systems	4	0	0	0	3	4	40	60	100
5	Core Practical P IV	1815414	Visual Programming Lab	0	0	4	0	2	4	40	60	100
6	Allied Paper P IV	1808425	Mathematics - IV	6	0	0	0	5	6	40	60	100
7	Soft Skill	1840401	Soft Skills**	2	0	0	0	3	2	40	60	100
8	EVS	1813412	Environmental Studies	1	0	0	0	2	1	40	60	100
Total				25	1	4	-	**24**	**30**	**320**	**480**	**800**

CIA-Continuous Internal Assessment

ESE-End Semester Examination

English and Soft Skills*- Syllabus framed and approved by English Department.

Language - Syllabus framed and approved by Language Departments.

DEPARTMENT OF COMPUTER SCIENCE

SCHEME OF V SEMESTER B.Sc PROGRAMME

Sl. No.	Course Category	Course Code	Course	Credit Distribution				Over all Credits	Total Contact Hours/ Week	Marks		
				L	T	P	S			CIA	ESE	Total
1	Core Theory T IX	1815515	Operating Systems	5	0	0	0	3	5	40	60	100
2	Core Theory T X	1815516	Database Management Systems	4	1	0	0	3	5	40	60	100
3	Core Theory T XI	1815517	Computer Graphics	5	0	0	0	3	5	40	60	100
4	Core Theory Elective II	1815518	ASP. Net Programming / Advanced Java Programming/ Multimedia	4	1	0	0	5	5	40	60	100
5	Core Practical P V	1815519	RDBMS Lab	0	0	5	0	2	5	40	60	100
6	Core Practical P VI	1815520	Lab Based on Elective II	0	0	5	0	5	5	40	60	100
7	Value Education	1870501	Value Education	2	0	0	0	3	2	40	60	100
total				12	5	7	-	**24**	**30**	**280**	**420**	**700**

CIA-Continuous Internal Assessment

ESE-End Semester Examination

DEPARTMENT OF COMPUTER SCIENCE

SCHEME OF VI SEMESTER B.SC COMPUTER SCIENCE PROGRAMME

Sl. No.	Course Category	Course Code	Course	Credit Distribution				Over all Credits	Total Contact Hours/ Week	Marks		
				L	T	P	S			CIA	ESE	Total
1	Core Theory T XIII	1815621	Programming in PHP	4	1	0	0	4	5	40	60	100
2	Core Theory T XIV	1815622	Python Programming	4	1	0	0	4	5	40	60	100
3	Core Theory T XV	1815623	Software Engineering	5	0	0	0	4	5	40	60	100
4	Core Theory Elective III	1815624	Data mining / Digital Image Processing/Unified Modeling Language	5	0	0	0	5	5	40	60	100
5	Core Practical P VII	1815625	PHP and Python Programming Lab	0	0	5	0	3	5	40	60	100
6	Core Practical P VIII	1815626	Mini Project	0	0	5	0	5	5	40	60	100
7	Extension Activities	1880601	Extension Activities	0	0	1	0	1	0	0	0	0
			Total	18	2	11	0	**26**	**30**	**240**	**360**	**600**

CIA-Continuous Internal Assessment

ESE-End Semester Examination

Extension Activities – Organized by the Institution.

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FIRST SEMESTER

Course Title: CORE THEORY T I - COMPUTER FUNDAMENTALS
(For Students admitted from 2018 onwards)

Course Code	**: 1815101**	**Credits**	**: 03**
L: T:P:S	**: 4:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To Impart the Knowledge of Fundamentals of Computers.*
- *To discover the Knowledge of newly invented devices and Units.*
- *To compute with the interconnected networks for the linkage of Worldwide Networks.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Restate the Definition of Computers. • To study about Compilers, Assemblers and Interpreters. • To clarify the concepts of diligence and versatility of computers.
CO2	• Extracting the nature of Input and Output Devices. • To impart the applications of devices in various Fields.
CO3	• To differentiate the types of Memory • To demonstrate the importance of Winchester Disks.
CO4	• To classify the Characterization of Software. • Explain the Structure of Algorithms, Programs and Flowcharts. • To impart the knowledge of Computers in Business.
CO5	• Scholastic Representation of Web Portals, Search Engines. • To Point out the Importance of Emails-Composing and receiving of Messages.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	2	3	2	2	3
CO2	3	3	3	3	2	3
CO3	3	2	2	2	2	3
CO4	3	2	2	3	2	2
CO5	3	2	3	2	3	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	COs
1	Evolution of Computers - Generations, Types of computers, Computer system characteristics, Basic components of a Digital Computer - Control unit, ALU, Input/Output functions and memory, Memory addressing capability of a CPU, Word length of a computer, processing speed of a computer, Computer Classification	**10**	**CO1**
2	Input/Output Units-: Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Dot Pitch, Video Standard - VGA, SVGA, XGA etc., Printers & types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers.	**10**	**CO2**
3	Memory - RAM, ROM, EPROM, PROM and other types of memory, Storage fundamentals - Primary Vs Secondary Data Storage, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk, Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW, USB Pen drive	**15**	**CO3**
4	Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Programming languages, Assemblers, Compilers and Interpreter, Computer Applications in Business.	**15**	**CO4**
5	Introduction to Internet, connecting to the Internet Hardware, Software & ISPs, Search Engines, Web Portals, Online Shopping, Email – Types of email, Compose and send a message. Reply to a message, Working with emails.	**10**	**CO5**

TEXT BOOK:

1. B. Ram, “Computer Fundamentals, Architecture and Organization”, New Age International Publishers

REFERENCE BOOK:

1. S.K.Basandra, “Computers Today “, GalgotiaPublications.

2. P.K. Sinha, “Computer Fundamentals – P. K. Sinha – BPBPublication

E-REFERENCES:

1.https://books.google.co.in/books?id=ICjqr6V9S6UC&printsec=frontcover#v=onepage&q&f=false

FIRST SEMESTER

Course Title: CORE THEORY T II - DIGITAL ELECTRONICS AND MICROPROCESSOR
(For Students admitted from 2018 onwards)

Course Code	**: 1815102**	**Credits**	**: 03**
L: T:P:S	**: 3:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To Impart the Knowledge of Fundamentals of Electronics.*
- *To discover the Knowledge of Microprocessor and its Units.*
- *To discuss and utilization of Various Number Systems and Architectures of Microprocessors.*
- *Demonstration of Flip Flops and the Registers associated.*
- *Outlining the Commands and Instructions of Processors*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• To demonstrate the functional codes of Binary Systems. • To study about the concepts of Logic Gates. • To clarify the concepts of Boolean Functions.
CO2	• Extracting the nature of Combinational Logic Circuits. • To impart the applications of Encoders and Decoders. Classification of Flipflops.
CO3	• To differentiate the types of Registers and their applications. Demonstrating the Classification of Counters.
CO4	• To classify the Characterization of Microprocessor and Micro Computers. • Introduction of 8085 Instructions and their Utilities. To impart the knowledge of Assembly Language Programs and Addressing Modes.
CO5	• Representation of Time Delayed Programs on a Register pair. To Point out the Importance of Various types of Interrupts.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	2	2	2	2
CO2	3	3	3	2	3	3
CO3	3	2	3	2	3	3
CO4	3	3	3	2	3	2
CO5	3	3	2	3	2	2

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	COs
1	Binary Systems & Code conversion, Boolean Algebra & Logic Gates– Truth Tables – Universal Gates – Simplification of Boolean functions: SOP, POS methods –K-map.	**10**	**CO1**
2	Combinational Logic: Adders & Subtractors – Multiplexer – Demultiplexer - Encoder – Decoder. Sequential Logic: RS, Clocked RS, D, JK, Master Slave JK, T Flip- Flops.	**10**	**CO2**
3	Shift Registers – Types of Shift Registers – Counters: Ripple Counter – Synchronous Counters – Up-Down Counter.	**10**	**CO3**
4	Introduction to Microprocessors, Microcomputers, and Assembly Language – Microprocessor Architecture and Its Operations – 8085MPU– Introduction to 8085 Instructions: Data Transfer Operations – Arithmetic, Logic and Branch Operations – Writing Assembly Language Programs- Addressing Modes.	**15**	**CO4**
5	Time Delay Programs: Time Delay Using One Register – Using a Register Pair – Using a Loop within Loop Technique - Stack and Subroutines - 8085 Interrupts: Vectored Interrupt – 8085 TRAP –DMA.	**15**	**CO5**

TEXT BOOKS:

1. M.Moris Mano, “Digital Logic and Computer Design”, First Edition, 2004, Pearson.
2. Ramesh S. Gaonkar, 1999, Microprocessor Architecture, Programming and Applications with the 8085, Fifth Edition, 1999, Penram International Publishing (India) Pvt.Ltd.

REFERENCE BOOKS:

1. D. P. Leach & A.P. Malvino, “Digital Principles and Applications”, Fifth Edition, 2002, TMH
2. T. C.Bartee, “Digital Computer Fundamentals”, Sixth Edition, 1991,TMH.
3. R.J.Tocci, “Digital System Principles and Applications”, Tenth Edition, 2012, Pearson Education.

E-REFERENCES:

1. http://nptel.iitm.ac.in/video.php?subjectId=117106086
2. http://nptel.iitm.ac.in/Onlinecourses/Srinivasan/

FIRST SEMESTER

Course Title: NON-MAJOR ELECTIVE I - FUNDAMENTALS OF INFORMATION TECHNOLOGY
(For Students admitted from 2020 onwards)

Course Code	**: 2015103**	**Credits**	**: 02**
L: T:P:S	**: 2:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Develop a Graphical User Interface (GUI) based on problem description*
- *Understanding the Digital Domain*
- *Develop applications using Fundamentals of computers.*
- *Depth knowledge in Computer architecture and types of Network security.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Introduction to Information Technology • Understanding the Digital Domain. Representing Numbers and text in Binary codes.
CO2	• Fundamentals of Computers: Computer Hardware-Software-System • Development of Software applications. Introduction of Software translators MLL-HLL-ALL
CO3	• Demonstration of Transmission of Information. • Creating the Fundamentals of Communications. Explanation of Fiber Optics-Wireless communications.
CO4	• Goals of computer networking. • Developing Goals Topologies-LAN, WAN, MAN.
CO5	• Implementation of Internet Architecture • Types of Network Security Incorporating Internet applications-Internet Address-Domain Name-E-mail.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	3	2	3	3
CO2	3	3	3	2	3	3
CO3	3	3	3	3	2	2
CO4	3	3	3	3	3	3
CO5	3	3	3	3	2	3

3-Strong 2-Medium 0-Low

Sl No.	Contents of Module	Hrs	Cos
1	Introduction to Information Technology-Understanding the Digital Domain-Representing Numbers and text in Binary-binary code	06	CO1
2	Fundamentals of Computers: Computer Hardware-Software-System. Software-Application Software-Translators-MLL-HLL-ALL.	06	CO2
3	Transmission of Information: Fundamentals of Communications-Fiber Optics-Wireless Communications-ISDN.	06	CO3
4	Computer Networking: Goals-Topologies-Local Area Networks-Wide Area Networks-Communication Protocol	06	CO4
5	Internet Architecture-Types of Network Security-Internet applications-Internet Address-Domain Name-E-mail.	06	CO5

TEXT BOOKS:

1. Introduction to Information Technology PelinAksoy, LauraDeNardis, Cengage Learning India Private Limited, First Indian Reprint 2008.

REFERENCE BOOKS:

1. M.Moris Mano, "Digital Logic and Computer Design", First Edition, 2004, Pearson.
2. Behrouz and Forouzan,2001, Introduction to Data Communication and Networking, 3rd Edition, MH.

E-REFERENCES:

1. http://www.tutorialspoint.com/computer_fundamentals/index.htm
2.https://www.tutorialspoint.com/basics_of_computers/index.htm

FIRST SEMESTER

Course Title: CORE PRACTICAL P I -DIGITAL ELECTRONICS AND MICROPROCESSOR LAB
(For Students admitted from 2018 onwards)

Course Code	**: 1815104**	**Credits**	**: 02**
L: T:P:S	**: 0:0:4:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

The main objective is to understand and to solve the problems for any task.

Lab Exercises:

DIGITAL ELECTRONICS

1. Verification of Truth Table for AND, OR, NOT, NAND, NOR and EX-OR gates.
2. Realization of NOT, AND, OR, EX-OR gates with only NAND and only NOR gates.
3. Karnaugh Map Reduction and Logic Circuit Implementation.
4. Verification of Boolean Laws.
5. Implementation of Half-Adder and Half-Subtractor.
6. Implementation of Full-Adder and Full-Subtractor.
7. Four Bit Binary Adder.
8. Four Bit Binary Subtractor using 1's and 2's Complement.
9. Design of Shift Registers
10. Design of Binary Counters.

MICROPROCESSOR

1. 8 Bit Addition and Subtraction.
2. 16 Bit Addition.
3. BCD Addition.
4. BCD Subtraction.
5. 8 Bit Multiplication.
6. BCD Multiplication.
7. 8 Bit Division.
8. Block Move
9. Reversing Array Elements.
10. Searching for an Element in an Array.
11. Finding Largest and Smallest Elements from an Array.
12. Sorting in Ascending and Descending Orders.

********End of First Semester********

SECOND SEMESTER

Course Title: CORE THEORY T III- OBJECT ORIENTED PROGRAMMING USING C++
(For Students admitted from 2018 onwards)

Course Code	**: 1815205**	**Credits**	**: 03**
L: T:P:S	**: 3:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Discuss and elaborate the concept of OOPs.*
- *Analyze the problem and apply the retreated concept in Application areas.*
- *Usage of pointers and Outline of files.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Revise the basics of Building any programming language. • Introduction of OOPs and its Concept.
CO2	• Define functions and its important in building the code. • Advantage of using Inline function. • Explanation about Arrays with illustration.
CO3	• Definition of Classes and important of Object. • Benefits of using Friend Function. • Define the concept of constructor, destructor and its usage and its implementations.
CO4	• Develop programs for overloading Unary and Binary Operators. • Enhance reusability features using the concept inheritance. • Avoid the duplicate of multiple inheritance using virtual base class.
CO5	• Access the memory Address of any variable using pointers. • Create file and Apply File Modes based on its usage.
CO6	• Revise the basics of Building any programming language. • Introduction of OOPs and its Concept.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	2	3	2	3
CO2	3	3	3	3	2	3
CO3	3	3	3	3	2	3
CO4	3	3	3	3	2	3
CO5	3	2	3	3	2	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	Basic concepts of OOP- I/O statements - Data types – Operators - Control Structures: Decision making statements - Looping Statements.	10	CO1
2	Functions - Function declarations and definitions - Passing arguments - Inline functions –Function Overloading-Arrays –one dimensional and two-dimensional arrays - Passing arrays to functions.	10	CO2
3	Classes& Objects: Class - Defining member functions, Static Data Members - Passing objects to function - Returning objects - Friend function - Default Arguments. Constructor - Types of Constructors - Destructors.	15	CO3
4.	Operator Overloading - Rules for overloading operators - Overloading of unary and binary operators. Inheritance - Types of inheritance - Virtual base classes	15	CO4
5.	Pointers- this pointer – Pointer to an Object - Virtual functions. Working with files - Classes for file stream operations - Opening and closing a file -Detecting EOF - File modes for opening	10	CO5

TEXT BOOKS:

1. E.Balaguruswamy, “Object Oriented Programming in C++”, Sixth Edition, 2012,TMH.

REFERENCE BOOKS:

1. H. Schildt, “The Complete Reference C++”, Fourth Edition, 2002, TMH
2. KanetkarY,” Let us C++”, Third Edition, 1999, BPB Publishers.
3. John R Hubbard, “Programming with C++”, Third Edition, 2009, TMH.

E-REFERENCES:

1. http://en.highscore.de/cpp/boost/
2. http://bookboon.com/en/structural-programming-with-c-plus-plus-ebook

SECOND SEMESTER

Course Title: CORE THEORY T IV- DATA STRUCTURES
(For Students admitted from 2018 onwards)

Course Code	**: 1815206**	**Credits**	**: 03**
L: T:P:S	**: 3:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Explaining the concept of data structures and its applications*
- *Structuring the Applications of Arrays, Searching Techniques.*
- *Emphasizing the types of Linked Lists and Polynomials.*
- *Explaining the Types of Trees.*
- *Elaborating the concepts of Graphs, Dijkstra's Shortest Path*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• To Demonstrate the Definition and Classification of Arrays. • To study about the concepts of Searching Techniques. • To impart the concepts of Sorting Techniques.
CO2	• To elaborate the operations and applications of Stack. • To impart the applications of Queues and operations on the Queues.
CO3	• To elaborate the Addition of Polynomials. • To study the Operations on Linked Lists.
CO4	• Representation of Trees. • To impart the knowledge of Tree Traversals, Threaded Binary Trees.
CO5	• Representation of Exception and Pre-Defined Exception. • To Point out the Importance of Graphs, Traversals and Algorithms.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	3	3	2	3
CO2	3	3	3	2	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	2	2
CO5	3	3	3	2	2	2

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	Data Structures – Definition and Classification - Arrays – Array Operations – Representation of Arrays – Applications of Arrays. Searching Techniques – Linear Search – Binary Search. Sorting techniques – Bubble Sort, Selection Sort, and Insertion Sort	**10**	**CO1**
2	Stack – Operations on Stacks - Stack applications – Infix to Postfix notation and Evaluation of Postfix notation. Queues - Operations on the Queues - Circular queue – Dequeue	**10**	**CO2**
3.	Introduction to the Linked List - Basic operations on linked list – Singly Linked Lists – Doubly Linked Lists – Circularly Linked Lists –Addition of Polynomials.	**10**	**CO3**
4.	**T**rees - Basic Terminology - Binary Trees - Representation of Trees and Binary trees - Binary Tree Traversals – Binary Search Trees - Threaded Binary Trees.	**15**	**CO4**
5.	Graphs – Basic Terminology – Representation of Graphs - Graph Traversals– Minimum Cost Spanning tree - Dijkstra's Shortest Path.	**15**	**CO5**

TEXT BOOK:

1. S. Sahni& E. Horowitz, "Fundamentals of Data Structure", Second Edition, 1999, Galgotia Publications.
2. Alfred V.Aho, John E.Hopcraft, Jeffrey D.Ullman, "Data Structures and Algorithms", 2009,Addison-Wesley.Edition, Wiley Publications, 2017.

REFERENCE BOOKS:

1. G.A. Vijayalakshmi Pai, "Data structures and Algorithms- Concepts, Techniques and Applications", First Edition, 2011, Tata McGraw-Hill.
2. Dr. A. Chitra, "Data Structures", 2009, Vijay Nicole Imprints Private Limited.

E-REFERENCES:

1. https://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
2. https://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-%20Guwahati/data_str_algo/ frameset.htm

SECOND SEMESTER

Course Title: NON-MAJOR ELECTIVE II - HTML AND WEB DESIGN
(For Students admitted from 2020 onwards)

Course Code	**: 2015207**	**Credits**	**: 02**
L: T:P:S	**: 2:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Demonstrate knowledge of Web programming terminology and how applied using Web Browsers (e.g., Web writing styles, election statements, design and management, etc.)*
- *Develop a Graphical User Interface (GUI) based on problem description*
- *Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events*
- *Develop an Algorithm to verify Image size and padding*
- *Develop and debug applications using Hyperlinking from graphics.*
- *Develop programs that retrieve input from a file as opposed to input only provided by user*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Introduction to WWW. • Common terms of Web writing styles, Web design and management. • Concepts of HTML Programming. • Introduction to Telnet and FTP
CO2	• Basics of HTML. • Development of Hyperlinks and style sheets. • Introduction of Lists and Backgrounds.
CO3	• Demonstration of Graphics format for Web use. • Creating and arranging the elements in Web page. • Explanation for Image size and padding.
CO4	• Create Hyper linking from Graphics. • Developing Thumbnail using Graphics. • Creating Tables – Formatting Tables.
CO5	• Implementation of Layouts: Creating Division-Based Layouts • Usage of Frames layout. • Incorporating Audio and Video using Frames.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	3	2	3	2
CO2	3	3	2	3	3	3
CO3	2	3	3	3	2	2
CO4	3	3	3	2	3	2
CO5	2	3	3	3	2	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	World Wide Web: Introduction the web defined – web browser details – web writing styles – web presentation outline, design, and management – registering web pages. Searching the World Wide Web: introduction – directories, search engines and meta search engines – search fundamentals – search strategies – how does a search engine works. Telnet and FTP: introduction – telnet and remote login – File transfer – Computer Viruses	06	CO1
2	HTML Basics: Understanding HTML – Setting Up the Document Structure – Formatting Text by Using Tags – Using Lists and Backgrounds – Creating Hyperlinks and Anchors Style Sheets and Graphics: Introduction to Style sheets	06	CO2
3	Graphics: Selecting a Graphics Format – Preparing Graphics for Web Use – Inserting Graphics – Arranging Elements on the Page – Controlling Image Size and Padding	06	CO3
4	Hyper linking from Graphics – Utilizing Thumbnail Graphics – Including Alternate Text for Graphics- Navigation: Creating Navigational Aids – Creating Tables – Formatting Tables	06	CO4
5	Layouts: Creating Division-Based Layouts – Creating User Forms – Using Frames for Layout – Incorporating Audio and Video	06	CO5

TEXT BOOK:

1. Microsoft Step by Step – HTML and XH, Faithe Wempen, Prentice Hall of India Private Limited, New Delhi.

REFERENCE BOOK:

1. Ivan Bayross, “Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP”, Fourth Edition, 2010, BPB Publications.

E-REFERENCES:

1.http://www.tutorialspoint.com/html_webdesign/index.html

SECOND SEMESTER

Course Title: CORE PRACTICAL P II- OOPS AND DATA STRUCTURES LAB
(For Students admitted from 2018 onwards)

Course Code	**: 1815208**	**Credits**	**: 02**
L: T:P:S	**: 0:0:4:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

To develop the programming skills in C++ and 8085 assembly language.

Lab Exercises:

C++

1. Program using classes and objects.
2. Program using Inline function.
3. Program using Static Members.
4. Program using constructor and destructor.
5. Program for various types of inheritance.
6. Program for Function Overloading.
7. Program using operator overloading.
8. Program using virtual functions.
9. Program using files.

DATA STRUCTURES

1. Program using arrays.
2. Program for searching techniques.
3. Program for sorting techniques.
4. Program using Stack.
5. Program using Queue.
6. Program using Linked List.
7. Program for tree traversals.
8. Program for graph traversals

********End of Second Semester********

THIRD SEMESTER

Course Title: CORE THEORY T V- JAVA PROGRAMMING
(For Students admitted from 2018 onwards)

Course Code	**: 1815309**	**Credits**	**: 03**
L: T:P:S	**: 3:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To get in-depth Knowledge about the evolution of java and its Features.*
- *Bring out the difference and similarities between C, C++ and java.*
- *Develop programmers in Java with its special Features.*
- *Implementing the code in internet using Applet with AWT controls.*
- *Course Outcomes: At the end of the Course, the Student will be able to:*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Knows the reason about the evolution of Java its development. • Study the basic of Java and to develop code. • Importance of Java comparing the other language.
CO2	• Develop program using constructors and its types. • Definition of inheritance and Writing programmed related to it • Differentiate string class and string buffer.
CO3	• Concept of packages, interface, threads. • Implementing the concept Exception handling various application. • Significance of exception handling. • Life cycle of thread.
CO4	• Explain I/O streams. • Create file using Byte Stream and character Stream classes.
CO5	• Usage of Java in internet • Definition of Applet and Developing code to connect to internet. • Life Build Applet code using AWT controls and Layout managers

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	2	2	3	3	3	3
CO2	3	2	3	3	3	2
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	3	3	3

3-Strong 2-Medium 1-Low

SI No.	Contents of Module	Hrs	Cos
1	Introduction to Java - Features of Java –Java Tokens - Data Types - Variables - Arrays - Operators - Control Statements.	**10**	**CO1**
2	Classes - Objects - Constructors - Overloading method - Static and Final members - String Objects - String Class - String Buffer - Inheritance - Overriding methods - Using super- Abstract class.	**15**	**CO2**
3	Packages - Interfaces - Exception Handling –User-Defined Exception – Multithreading - Thread - Runnable Interface.	**10**	**CO3**
4	I/O Streams: Stream classes – Byte stream classes - Character stream classes - File Streams – Using File class – File exceptions – Creation of file – Reading or writing characters/bytes – Random access files.	**10**	**CO4**
5	Applets – Preparing to write applets – Building Applet code – Applet life cycle – Applet tag – Passing parameters to Applets - AWT Controls - Layout Managers.	**15**	**CO5**

TEXT BOOKS:

1. E. Balagurusamy, “Programming with Java”, Fourth Edition, 2010, Tata McGraw-Hill.
2. P Radha Krishna, “Object Oriented Programming through Java”, Second Edition, 2007, Universities Press.

REFERENCE BOOKS:

1. K. Arnold and J. Gosling, “The Java Programming Language”, Second Edition, 1996, Addison Wesley.
2. P. Naughton and H. Schildt, “Java2 (The Complete Reference)”, Eight Edition,2005, Tata McGraw Hill.
3. Kathy Sierra and Bert Bates, “Head First Java”, Second Edition, 2003, Oreilly

E-REFERENCES:

1. www.tutorialspoint.com/java/java-quick-guide.htm
2. www.ntu.edu.sg/home/ehchua/programming/java/J3a_OOPBasics.html
3. www.tutorialspoint.com/java/java_overview.htm

THIRD SEMESTER

Course Title: CORE THEORY T VI -WEB DESIGN
(For Students admitted from 2018 onwards)

Course Code	**: 1815310**	**Credits**	**: 03**
L: T:P:S	**: 3:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Explaining the concept of Web design and its applications.*
- *Detailed description for Internet Domains and establishing Connectivity Internet.*
- *Structuring the HTML tags, Lists, Tables, Frames, Forms and Forms elements.*
- *Emphasizing the DHTML Style Sheets, linking a Style Sheet and Web page designing.*
- *Explaining the concepts of JavaScript, Functions and Looping constructs.*
- *Elaborating the concept of JavaScript Document Object Model and Cookies.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• To Demonstrate Internet Basic concepts and Internet Domains • To Study about Internet Server Identities • To impart the concepts of Establishing Connectivity on the Internet
CO2	• To classify the HTML Tags. • To impart Lists, Frames and Table To the Forms and Forms Elements.
CO3	• To elaborate DHTML Style Sheets and Element of the Style. • To impart Linking a style sheet to a html documents and Web page designing.
CO4	• Representation of JavaScript Data types, Control and Looping and Functions. • To point out the knowledge about the Dialog Boxes.
CO5	• Representation of JavaScript Document Object Model and Event Handling. • To point out Form object, User Defined Object and Cookies.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	3	3	2	3
CO2	3	3	3	2	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	2	2	2
CO5	3	3	2	2	2	2

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	Internet: Basic Concepts – Communicating on Internet – Internet Domains – Internet Server Identities – Establishing Connectivity on the Internet	10	CO1
2	Introduction to HTML -Anchor Tag – Hyperlink - Head and Body Section – Heading - Horizontal Ruler – Paragraphs – Tags - Images and Picture – Lists – Tables – Frames - Forms and forms elements.	10	CO2
3	DHTML and Style sheets - Defining styles - Elements of style - Linking a style sheet to a html documents - Inline style - External style sheets - Multiple styles- Web page designing.	15	CO3
4	Introduction to Java script - Advantage of JavaScript - Data type - Variable – Array - Operator and Expression - Control and looping Constructs - Functions - Dialog Boxes.	15	CO4
5	JavaScript Document Object Model - Event Handling - Form Object - Built in Object - User Defined Object-Cookies.	10	CO5

TEXT BOOKS:

1. Ivan Bayross, "Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP", Fourth Edition, 2010, BPB Publications

REFERENCES:

1. Harvey M. Deitel, Paul J. Deitel, Tem R. Nieto, "Internet & World Wide Web – How to program", Third Edition, 2002, Prentice Hall

E-REFERENCES:

1. http://books.google.co.in/books?id=BrASwbtAGGUC&pg=PA69&source=gbs_selected_pages&cad=2#v=onepage&q&f=false

THIRD SEMESTER

Course Title: CORE PRACTICAL P III - JAVA AND WEB DESIGN LAB

(For Students admitted from 2018 onwards)

Course Code	**: 1815311**	**Credits**	**: 02**
L: T:P:S	**: 0:0:4:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To apply the Java concepts through various applications and to develop a web page*.

Lab Exercises:

JAVA & APPLETS

1. Program using String Class.
2. Program using String Buffer.
3. Programming using Inheritance.
4. Program using interface.
5. Program using Exception Handling.
6. Program using packages.0
7. Program using Files.
8. Implementing Thread based applications
9. Working with Colors, Fonts and Shapes.
10. Usage of AWT components in suitable applications.

WEB DESIGN

1. Program for HTML page to demonstrate the usage of List Tags.
2. Program for HTML page to demonstrate the usage of Table Tags.
3. Program for HTML page to demonstrate the usage of Frames.
4. Program to illustrate hyperlink using Mouse Over event.
5. Program to create a document which opens a new window without a toolbar, address bar or a status bar that unloads itself after one minute.
6. Program using CSS.
7. Program using arrays.
8. Program using Operators and expressions.
9. Program using Functions and dialog boxes

********End of Third Semester********

FOURTH SEMESTER

Course Title: CORE THEORY T VI-VISUALPROGRAMMING
(For Students admitted from 2018 onwards)

Course Code	**:1815412**	**Credits**	**: 03**
L: T:P:S	**: 2:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements.)*
- *Develop a Graphical User Interface (GUI) based on problem description*
- *Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events*
- *Develop an Algorithm to verify processing is accurate*
- *Develop and debug applications using Visual Basic 2010 (or version required for the course) that runs under Windows operating system*
- *Develop programs that retrieve input from a file as opposed to input only provided by user*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Introduction to GUI. • Common terms of Visual Programming. • Concepts of Visual Programming. • Program design tools with its properties.
CO2	• Programming Paradigms. • Development of program. • Coding using control structures.
CO3	• Demonstration of Form design. • Create Menus. • Explanation for passing parameters by Val and by ref. • Importance of Function procedure.
CO4	• Create Database file using MS-Access. • Develop programs by taking MS-Access as Backend. • Usage of ActiveX data control.
CO5	• Implementation of Error Handling. • Usage of Dialog Boxes. • Importance of OLE.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	3	3	3	2
CO2	3	3	2	3	3	2
CO3	3	3	3	3	3	2
CO4	3	3	3	3	2	3
CO5	3	3	3	2	3	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	Introduction to Visual Basic- introduction Graphical User Interface (GUI), Programming Language (Procedural, Object Oriented, Event Driven), The Visual Basic Environment-VB Controls Textboxes, Frames, Check Boxes, Option Buttons, List Boxes & Combo Boxes, Images, setting a Border & Styles, The Shape Control, the line Control, Working with multiple controls and their properties, Coding for controls.	10	CO1
2	Variables, Constants, and Calculations-Variables, Variables Public, Private, Static, Constants, Data Types, Naming -rules/conventions, Constants, Named & intrinsic, declaring variables, Scope of variables, Val Function, Arithmetic Operations, Formatting Data- handling Strings - Decision & Conditions- If Statement, If then-else Statement, Nested If Statements, Do/Loops, For/Next Loops, Case Structure, Displaying Message in Message Box- Using Call Statement to call a procedure.	15	CO2
3	Menus, Sub-Procedures and functions, using common dialog box, creating a new sub-procedure, Passing Variables to Procedures, Passing Argument ByVal or ByRef, writing a Function Procedure, Multiple Forms - Creating, adding, removing Forms in project - Arrays Single-Dimension Arrays, Initializing an Array using for Each, Two dimensional arrays.	10	CO3
4	Creating the database files for use by Visual Basic (Using MS-Access), Using the ActiveX Data Control (ADO), navigating the database in code using record set object, using list boxes & combo boxes as data bound controls, updating a database file (adding, deleting records) - Displaying data in grids (grid control, properties of grid), searching for a specific record (find first, find next, find last, find previous), seek method, working with database fields	15	CO4
5	Trapping Program Errors, The Err Object, Dialog Boxes- COM/OLE - automation - DLL Servers - OLE Drag and Drop.	10	CO5

TEXT BOOKS:

1. Gary Cornell, “Visual Basic 6 from the Ground up”, First Edition, 1999, TataMcGraw-Hill.
2. Steven Holzner, “Visual Basic 6 Black Book”, Second Edition, 1999,Oreilly.

REFERENCES:

1. Noel Jerke, “Visual Basic 6 (The Complete Reference)”, Second Edition, 1999, TataMcGraw-Hill.
2. Overland Brian, “Visual Basic 6 in Plain English”, Third Edition, 1999, JohnWiley.

E-REFERENCES:

1. www.tutorialspoint.com/listtutorials/visual-basic/

FOURTH SEMESTER

Course Title: CORE THEORY T VII- ELECTIVE I -COMPUTER NETWORKS
(For Students admitted from 2018 onwards)

Course Code	**:** 1815413	**Credits**	**: 03**
L: T:P:S	**: 4:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Study the basic taxonomy and terminology of the computer networking and enumerate the layers of OSI model.*
- *Overview of TCP/IP models and comparison with OSI models*
- *Acquire knowledge of Application, datalink, network, transport layers***.**

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Usage of computer networks. • Describe the functions of each layer in OSI and TCP/IP model.
CO2	• basics of Physical layer, and apply them in real time applications. • Techniques in multiplexing and switching.
CO3	• Design of Data link layer. • Deduction of errors and correction. Flow control using protocols
CO4	• Design of Network layers. • Generate IP address to find out the route through Routing algorithms
CO5	• Design of transport layer. • Protocols needed for end –end delivery of packets Role of layer in real time applications

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	2	2	2	3	3
CO2	3	3	3	2	3	3
CO3	3	3	3	2	3	3
CO4	3	3	3	2	3	3
CO5	3	3	3	2	3	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	Introduction – Uses of Computer Networks – Network Hardware- Network Software- OSI Reference Model – TCP/IP Reference Model.	10	CO1
2	Physical Layer – Guided Transmission media – Wireless Transmission – Public switched Telephone Network –Local Loop – Trunks – Multiplexing- Switching.	10	CO2
3	Data Link Layer – Design Issues- Error Detection and Correction- Simplex Stop and Wait Protocol- Sliding Window Protocol.	15	CO3
4	Network Layer – Design Issues – Routing Algorithm- IP Protocol – IP Addresses- Internet Control Protocols.	10	CO4
5	Transport Layer: Addressing- Connection Establishment-Connection Release. Internet Transport Protocol: UDP-TCP. Application Layer: DNS- Electronic Mail- World Wide Web.	15	CO5

TEXT BOOKS:

1. Andrew S. Tanenbaum, “Computer Networks”, Fourth Edition, 2008, PHI.

REFERENCE BOOKS:

1. Behrouz and Forouzan, “Data Communication and Networking”, Third Edition, 2006, TMH.

E-REFERENCE:

1. http://ceit.aut.ac.ir/~91131079/SE2/SE2%20Website/Lecture%20Slides.html

FOURTH SEMESTER

Course Title: CORE THEORY- ELECTIVE I -CLIENT-SERVER TECHNOLOGY
(For Students admitted from 2020 onwards)

Course Code	**: 1815413**	**Credits**	**: 3**
L: T:P:S	**: 4:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To understand the concepts of client-server computing and its technology***.**
- *To apply the techniques and features of a client-server technology.*
- *To learn the advantages of client-server systems over monolithic systems.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Comprehend the basic concepts of the client-server model. • Improve the performance and reliability of Client Server based systems.
CO2	• Components of Client-Server Applications and Role. • Understand how Client-Server systems work.
CO3	• Understand the Connectivity. • Comprehend the concept of different technologies.
CO4	• Understand the software and hardware requirements of Client-Server based systems. • Improve the common interface across platform.
CO5	• Understand the service and support of the system. • Identify security and ethical issues in Client Server Computing.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	3	2	3	3
CO2	3	3	3	2	3	3
CO3	2	3	3	2	2	3
CO4	3	3	3	2	2	3
CO5	3	2	3	2	3	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	COs
1	Client/Server Computing – Advantages of Client/Server Computing – Technology - Revolution - Connectivity – Ways to improve Performance – How to reduce network Traffic	**10**	**CO1**
2	Components of Client/Server Applications – The Client: Role of a Client – Client Services – Request for Service. Components of Client/Server Applications – The Server: The Role of a Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system	**10**	**CO2**
3	Components of Client/Server Applications – Connectivity: Open System Interconnect – Communications Interface Technology – Interprocess communication – WAN Technologies	**15**	**CO3**
4	Components of Client/Server Applications–Software: Factors Driving demand for application software development – Rising Technology Staff costs – Need to improve Technology – Need for Common Interface across Platforms – Client/Server System Development Methodology. Components of Client/Server Applications – Hardware: Hardware/Network Acquisition – PC-Level Processing Units – Machintosh, notebooks, Pen – UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS.	**15**	**CO4**
5	Components of Client/Server applications–Service and Support: System Administration. The Future of Client/Server Computing: Enabling Technologies – Transformational Systems.	**10**	**CO5**

TEXT BOOK:

1. Patric Smith, Steve Guenferich, "CLIENT/SERVER COMPUTING", Second Edition, Prentice Hall of India Private Limited, New Delhi (Chapters 1-8 & 10)

REFERENCE BOOK:

1."Internetworking with TCP/IP Client-Server Programming and Applications" by Douglas E Comer and David L Stevens

E- REFERENCES:

1.http://arts.nprcolleges.org/e%20content/commerce/Inroduction%20to%20Client%20Server%20computer-%20TCA8C23.pdf

FOURTH SEMESTER

Course Title: CORE THEORY- ELECTIVE I -ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS
(For Students admitted from 2020 onwards)

Course Code	**: 1815413**	**Credits**	**: 03**
L: T:P:S	**: 4:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Detailed understanding of the history of artificial intelligence (AI) and its foundations.*
- *Explaining the current scope, potential, limitations, and implications of intelligent systems.*
- *Implementing the applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.*
- *Elaborating the basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.*
- *Exploring the current scope, potential, limitations, and implications of intelligent systems*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• To demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents. • To impart the basic principles, techniques, and applications of Artificial Intelligence.
CO2	• To create an understanding of the basic issues of knowledge representation. • To analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game-based techniques to solve them
CO3	• To impart basic proficiency in representing difficult real-life problems in a state space representation so as to solve them using AI techniques like searching and game playing.
CO4	• To apply basic principles of AI in solutions that require problem solving, inference, perception and learning.
CO5	• To develop abilities to apply, build and modify decision models to solve real problems • To explore the issues involved in the design and development of Artificial Intelligence Based Decision Support Systems and discuss the role these systems play in the business environment.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	2	3	3	2
CO2	3	3	1	2	3	2
CO3	3	3	1	2	3	3
CO4	3	2	1	3	3	3
CO5	3	2	2	2	2	3
CO6	3	3	3	2	3	2

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	Introduction of Artificial Intelligence: Overview of Artificial Intelligence – Knowledge: General Concepts – Lisp and other AI Programming Languages.	10	CO1
2	Knowledge Representation – Formalized Symbolic logics – Dealing with Inconsistencies and Uncertainties – Probabilistic Reasoning - Structured Knowledge: Graphs, Frames and Related Structures – Object – Oriented Representations	10	CO2
3	Knowledge Organization and Manipulation: Search and Control Strategies – Matching Techniques – Knowledge Organization and Management	15	CO3
4	Perception and Communication: Natural Language Processing – Pattern Recognition – Visual Image Understanding.	15	CO4
5	Expert System Architectures: Rule-Based System Architectures – Nonproduction System Architectures – Dealing with Uncertainty – Knowledge Acquisition and Validation – Knowledge system Building Tools.	10	CO5

TEXT BOOK:

1. Dan W. Patterson," Introduction to Artificial Intelligence and Expert System", 2005, PHI Learning.

REFERENCE BOOK:

1. "Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig

E- REFERENCES:

1. http://www.ddegjust.ac.in/studymaterial/mca-5/mca-402.pdf

FOURTH SEMESTER

Course Title: CORE PRACTICAL P IV -VISUAL PROGRAMMING LAB

(For Students admitted from 2018 onwards)

Course Code	**: 1815414**	**Credits**	**: 02**
L: T:P:S	**: 0:0:4:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To improve the programming skills of the students with respect to advance concepts of Visual Basic*.

Lab exercise

1. Building simple applications with VB (Calculator and String Functions)
2. Working with intrinsic controls (Radio buttons, Check boxes, Picture boxes, Timer and Shape control)
3. Application using MDI form
4. Application using menus
5. Application using Dialog Boxes
6. Application using Functions (pass by value and Reference) and Procedures
7. Create database and performing the operations given below using a Menu
8. Driven program: (i) Insertion (ii) Deletion (iii) Modification (iv) Generating reports (Simple) for the following Systems using any RDBMS package:

a) payroll Processing
b) Mark sheet Processing
c) Library information system
d) Income tax processing system
e) Electricity bill preparation system
f) Telephone directory maintenance.

********End of Fourth Semester********

FIFTH SEMESTER

Course Title: CORE THEORY T IX - OPERATING SYSTEM
(For Students admitted from 2018 onwards)

Course Code	**: 1815515**	**Credits**	**: 04**
L: T:P:S	**: 5:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Stating the Services provided to the user and hardware by operating system.*
- *To communicate with the process through system calls.*
- *Define deadlocks and identify its presence in the system.*
- *Designing appropriate memory management scheme.*
- *To learn the mechanisms of OS to handle processes and threads and their communication.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Define OS with its view and goals and services rented by it Deign of OS with its structure. Message through interposes communication
CO2	• Allocation of process through scheduling algorithms. Define critical section problems and its usage. • Prevention of multiple process executing through the concept of semaphores
CO3	• Know the Mutual exclusion, Deadlock detection and agreement protocols for deadlock prevention and its avoidance
CO4	• Strategies of memory management schemes and the usage of virtual memory. • Apply prepare Replacement to algorithms to avoid thrashing
CO5	• Brief of storage management. • Methods to allocate files for proper protection.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	3	2	2	2
CO2	3	3	2	3	3	2
CO3	3	3	3	3	2	2
CO4	3	3	3	3	3	2
CO5	3	2	3	3	3	2

3-Strong 2-Medium 1-Low

Sl No.	**Contents of Module**	**Hrs**	**Cos**

1	Introduction- views and goals - Operating-System Services - User and Operating-System interface - System Call- Types of System Calls – Operating System Design and Implementation - Operating- System Structure. Process Management: Process concept- Process Scheduling - Operations on Processes- Interprocess Communication. Threads: Types of threads	**10**	**CO1**
2	Process Scheduling**:** Basic Concepts- Scheduling Criteria - Scheduling Algorithms Multiple-Processor Scheduling–CPU Scheduling. Synchronization: The Critical-Section Problem Synchronization Hardware – Semaphores- Classic Problem of Synchronization.	**15**	**CO2**
3	Deadlocks: Deadlock Characterization - Methods for Handling Deadlocks- Deadlock Prevention- Deadlock Avoidance - Deadlock Detection - Recovery from Deadlock.	**10**	**CO3**
4	Memory-Management Strategies**:** Swapping - Contiguous Memory Allocation – Segmentation- Paging - Structure of the Page Table. Virtual-Memory Management: Demand Paging - Page Replacement - Allocation of Frames -Thrashing.	**15**	**CO4**
5	Storage Management: File System- File Concept - Access Methods- Directory and Disk Structure -File Sharing- Protection. Allocation Methods - Free- Space Management - Efficiency and Performance – Recovery.	**10**	**CO5**

TEXT BOOKS:

1. A. SilberschatzP.B.Galvin, Gange. “Operating System Concepts”, Ninth Edition, 2013, Addison Wesley Publishing Co.

REFERENCE BOOKS:

1. H.M. Deitel, “An Introduction to Operating System”, Second Edition, Addison Wesley

E-REFERENCES:

1. http://www.cs.kent.edu/~farrell/osf03/oldnotes/
2. https://it325blog.fles.wordpress.com/2012/09/operating-system-concepts-7-th-edition.pdf

FIFTH SEMESTER

Course Title: CORE THEORY T X -DATABASE MANAGEMENT SYSTEMS
(For Students admitted from 2018 onwards)

Course Code	**: 1815516**	**Credits**	**: 04**
L: T:P:S	**: 4:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Detailed description for the structure of Database, file and records.*
- *Structuring the models for Normalization of different Normal Forms.*
- *Emphasizing the types of statements for control languages.*
- *Demonstration of Subprograms, Functions and Procedures*
- *Elaborating the concepts of Triggers and Cursors*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• To demonstrate the characteristics of Database Management Systems. • To study about the concepts and models of database. • To impart the concepts of System Development Life Cycle and E-R Model.
CO2	• To classify the keys and the concepts of Relational Algebra. • To impart the applications of various Normal Forms • Classification of Dependency.
CO3	• To elaborate the different types of Functions and Joins and their applications. • Introduction of Views, Sequence, Index and Procedure.
CO4	• Representation of PL-SQL Structure. • To impart the knowledge of Sub Programs, Functions and Procedures.
CO5	• Representation of Exception and Pre-Defined Exception. • To Point out the Importance of Triggers, Implicit and Explicit Cursors.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	3	3	2	3
CO2	3	3	3	2	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	2	3	2
CO5	3	3	2	2	2	2

3-Strong 2-Medium 1-Low

Sl No.	**Contents of Module**	**Hrs**	**Cos**
1	Introduction - Database System - Characteristics of Database Management Systems - Architecture of Database Management Systems - Database Models - System Development Life Cycle - Entity Relationship Model	**10**	**CO1**

2	Introduction to Relational Database Model - Structure of Relational Model – Keys - Relational Algebra - Normalization: Functional Dependency - First Normal form - Second Normal Form-Third Normal form - Boyce-Code Normal Form - Fourth Normal Form.	**15**	**CO2**
3	SQL: Introduction-Data Retrieval - Single row function - Group function - Set Function - Sub query - Joins. Data Manipulation Language: Insert, Update and Delete Statements - Transaction Control Language – View – Sequence – Synonym – Index - Defining Constraints	**15**	**CO3**
4	PL/SQL: Introduction-PL/SQL Basic-Character Set- PL/SQL Structure-SQL Cursor-Subprograms-Functions-Procedures.	**10**	**CO4**
5	Exception Handler Introduction - Predefined Exception - User Defined Exception – Triggers - Implicit and Explicit Cursors - Loops in Explicit Cursor.	**10**	**CO5**

TEXT BOOK:

1. Pranab Kumar Das Gupta and P. Radha Krishnan, "Database Management System Oracle SQL and PL/SQL", Second Edition, 2013, PHI Learning Private Limited.

REFERENCE BOOKS:

1. RamezElmasri and Shamkant B. Navathe, "Fundamentals of Database Systems", Fifth Edition, 2007, Pearson Publications.
2. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database System Concepts", Sixth Edition, 2010, Mc- 1Graw Hill Education.

E-REFERENCE:

1. https://www.amazon.in/DATABASE-MANAGEMENT-SYSTEM-ORACLE-SQL%20o/dp/B00LPGBWZ0#reader_B00LPGBWZ0

FIFTH SEMESTER

Course Title: CORE THEORY T XI -COMPUTER GRAPHICS
(For Students admitted from 2018 onwards)

Course Code	**: 1815517**	**Credits**	**: 04**
L: T:P:S	**: 5:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Explain the core concepts of computer graphics, including viewing, projection, perspective, modeling and*
- *transformation in two and three dimensions.*
- *Describe the fundamentals of animation, parametric curves and surfaces, and spotlighting.*
- *Identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Illustrate the concepts of various display devices and explain the types of input and output devices used in graphics systems. • Classify the various Line Drawing Algorithms with their characteristics. • Explain about graphic primitives and work with coordinate spaces, coordinate conversion.
CO2	• Point out and classify the types of transformation and their representations in Matrix form. • Design and implement the model of mapping from a World coordinates to device coordinates.
CO3	• Design to clip an image by using clipping techniques • Design the structure needed to represent graphical objects using different Input Functions
CO4	• Classify the various 3D geometric transformation and their composition. • Explore projections techniques for display 0f 3D scene on 2D scene.
CO5	• Subdivide the various color models that can be used in graphics system. • Apply the concepts of color models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	3	2	3	3
CO2	3	3	3	3	3	3
CO3	3	2	2	2	3	3
CO4	3	3	2	3	3	3
CO5	3	2	3	2	3	2

3-Strong 2-Medium 0-Low

Sl No.	**Contents of Module**	**Hrs**	**Cos**
1	Introduction - Overview of graphics systems: Video display devices, Refresh Cathode Ray Tube - Raster scan display - Random scan display - Interactive input devices - Output primitives: points and lines, line drawing algorithms - (DDA) - Bresenham's Line Drawing. Filled Area Primitives: Scan Line Polygon Fill – Boundary fill – Flood Fill	**15**	**CO1**
2	Two dimensional Geometric Transformations: Basic Transformation - Matrix representations and homogeneous coordinates, composite transformations. Two-dimensional viewing: Window-to-viewport coordinate transformation	**10**	**CO2**

3	2D Clipping: Point, Line, Cohen Sutherland Line Clipping – Polygon Clipping – Sutherland-Hodgeman polygon Clipping – Text Clipping. Graphical User Interfaces and interactive input methods: Input of Graphical data, Input functions.	**15**	**CO3**
4	Three dimensional geometric and modeling transformations: Translation, Rotation, Scaling and Composite transformations. Three-dimensional viewing: Viewing pipeline- Viewing coordinates-Projections.	**10**	**CO4**
5	Intuitive color concepts - RGB color model - YIQ color model - CMY color model -HSV color model - HLS color model- Color selection. .	**10**	**CO5**

TEXT BOOK:

1. Donald Hearn & M. Paulin Baker, "Computer Graphics", Second Edition, 2003, PearsonEducation.

REFERENCE BOOKS:

- W.M. Newman and R.F.Sproull, “Principles of Interactive Computer Graphics”, Tata McGraw Hill InternationalEdition.
- James D. Foley, Andries Van Dam, Steven K. Feiner, John F. Hughes, “Computer Graphics-Principles and Practice”, Second Edition, 2007, Pearson Education.

E-REFERENCES:

1. http://www.uptu.ac.in/pdf/sub_ecs_504_30sep14.pdf

FIFTH SEMESTER

Course Title: CORE THEORY ELECTIVE II -ASP. NET PROGRAMMING
(For Students admitted from 2018 onwards)

Course Code	**:1815518**	**Credits**	**: 04**
L: T:P:S	**: 4:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To understand the basic concepts of ASP.NET Framework.*
- *To learn the data types, different controls inVB.NET.*
- *To create ASP.Net applications using validation controls, ad rotator and rich controls.*
- *Creating ASP.Net applications using standard .net controls to develop a data driven web application for Connecting to data sources and managing them.*
- *To Maintain session and controls related information for user used in multi-user web applications.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• To gain the basic knowledge in ASP. NET with the Frame work.
CO2	• Understand to design web applications using ASP.NET. • Successful students will be able to use ASP.NET controls in web applications
CO3	• Enable to apply validation controls and to perform specific technical skills
CO4	• Apply the concept to create database driven ASP.NET web • applications and web services
CO5	• To create applications that use ADO.NET, cookies and webservices

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	2	2	3	3	3	2
CO2	3	3	2	3	3	3
CO3	3	3	2	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	3	3	3	2

3-Strong 2-Medium 1-Low

SI NO	**Content of module**	Hrs	Cos

1	Overview of ASP.Net Framework - Page Structure - Compiler Directives –Namespace.	10	CO1
2	Understanding ASP.Net Control: Standard Controls: Displaying information - Accepting user input - Submitting form data - Displaying images – Hyper Link control.	10	CO2
3	Overview of Validation Control- Required Field Validator Control-Range Validator Control-Compare Validator Control-Custom Validator Control- Validation Summary Control - Rich Controls: AdRotator, Calendar control.	15	CO3
4	Overview of Data Access: Data Bound Control - Data Source Control - Data Binding – SqlDataSource control -OleDb Connection - OleDb Command - OleDb Transaction - Data Adapter - Data Reader –Dataset.	15	CO4
5	List Control: Dropdown List – RadioButtonList – List Box Checkbox List – Bulleted List - Grid View Control – Repeater - Data List Control - Building Data Access Component with ADO.NET - Maintaining Application State: Browser Cookies - Session State, Web Services.	10	CO5

TEXT BOOK:

1. Stephen Walther, Kevin Hoffman and Nate Dudek, "ASP.Net 4 Unleashed", 2011, Pearson Education.

REFERENCE BOOKS:

1. Garvey M. Deitel, Paul J. Deitel, Tem R. Nieto, "Internet & World Wide Web – How to program", Third Edition, 2002, Prentice Hall.
2. Greg Buczek," ASP.NET Developer's guide", 2002, Tata McGraw-Hill.

E-REFERENCE:

1.http://books.google.co.in/books?id=BrASwbtAGGUC&pg=PA69&source=gbs_selected_pages&cad=2#v=onepage&q&f=false

Course Title: CORE THEORY ELECTIVE II- ADVANCED JAVA PROGRAMMING
(For Students admitted from 2018 onwards)

Course Code	**: 1815518**	**Credits**	**: 04**
L: T:P:S	**: 4:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To provide an in-depth knowledge of Advanced Java language and programming.*
- *To Implement Java components and practicing RMI, BEANS and JDBC.*
- *To provide the ability to design console based, GUI based and web-based applications.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Create dynamic web pages, using Servlets. • Learn to access database through Java programs, using Java Data Base Connectivity (JDBC) • To clarify the concepts of Servlet listener elements, filter elements
CO2	• Create dynamic web pages using JSP • Design and develop Web applications • To understand Java Messaging Services, Transactions.
CO3	• Invoke the remote methods in an application using Remote Method Invocation (RMI) • Implementing remote interfaces. • To demonstrate the importance of RMI over Inter-ORB Protocol.
CO4	• To make a reusable software component, using Java Beans. • To develop Notable Beans
CO5	• To review the Roles, Relationships and Responsibilities of the deployment descriptor, bean provider, server/container provider • To understand the difference between Entity Beans and Session Beans

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO 6**
CO1	3	3	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	2	3	2	3
CO4	3	3	2	3	2	3
CO5	3	3	2	3	2	3

3-Strong 2-Medium 1-Low

Sl No.	**Contents of Module**	**Hrs**	**Cos**

1	Servlet Overview: server side includes-Creating an HTML login screen-Using the Servlet Context -performing URL Redirection: Using Request Dispatcher -Using send Redirect -Session tracking with servlets –Cookies-URL rewriting -Hidden fields -session-tracking API with Http Session object –Listener-Filters-Deploying servlets -Servlet listener elements -Servlet filter elements -Applet-servlet communication- JDBC connectivity	**10**	**CO1**
2	JSP –Introduction JSP-Examining MVC and JSP -JSP scripting elements & directives-Working with variables scopes-Error Pages - using Java Beans in JSP Working with Java Mail-Understanding Protocols in Java Mail-Components-Java mail API-Integrating into J2EE-Understanding Java Messaging Services-Transactions.	**15**	**CO2**
3	RMI – Overview – Developing applications with RMI: Declaring& Implementing remote interfaces-stubs & skeletons, registering remote objects, writing RMI clients –Pushing data from RMI Servlet – RMI over Inter-ORB Protocol	**10**	**CO3**
4	Java Beans: Advantages – BDK - Developing Beans – Notable beans –Application Builder tool-JAR files-Introspection-Bound Properties-Persistence-customizers - Java Beans API.	**10**	**CO4**
5	EJB: EJB Component Model -Reviewing Roles, Relationships, and Responsibilities: The deployment descriptor -The bean provider -The server/container provider -The application assembler -The EJB deployer-The system administrator -Entity beans -Session beans.	**15**	**CO5**

TEXT BOOK:

1. McGovern,R.Adatia,Y. Fain, " J2EE 1.4 Bible" 2003, Wiley-dreamtech India Pvt. Ltd, New Delhi.
2. Schildt, "Java 2 Complete Reference", Fifth Edition, 2002, Tata McGraw-Hill, New Delhi.

REFERENCE BOOKS:

1. K. Moss, "Java Servlets", Second edition, 1999, Tata McGraw Hill, New Delhi.
2. D. R.Callaway, "Inside Servlets", 1999, Addison Wesley, Boston
3. Joseph O'Neil, "Java Beans from the Ground Up" 1998, Tata McGraw Hill, New Delhi.
4. TomValesky, Enterprise JavaBeans, Addison Wesley.

E-REFERENCES:

1. http://www.tutorialspoint.com/servlets/
2. http://www.javatpoint.com/jsp-tutorial
3. http://www.javatpoint.com/RMI
4. www.cis.upenn.edu/~bcpierce/courses/629/papers/Java-tutorial/beans/
5. www.tutorialspoint.com/ejb

FIFTH SEMESTER

COURSE TITLE: ELECTIVE II: MULTIMEDIA

(For Students admitted from 2018 onwards)

Course Code	**: 1815518**	**Credits**	**: 4**
L: T:P:S	**: 4:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To be aware of the fundamental concepts of Multimedia*
- *To work with all aspects of images in Multimedia.*
- *To know about various concepts of sound along with Multimedia*
- *To be aware of all the components video in Multimedia.*
- *To learn copyright laws associated with multimedia.*
- *To understand the cost involved in multimedia planning, designing, and producing.*
- *To learn ways to present their multimedia projects.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Defining the basic concepts of Multimedia and to learn about text in Multimedia.
CO2	• Introduce the concept of Image and Colors and thereby explain the concept of • Image File Formats, Sound and Various Audio File Formats.
CO3	• Acquire the knowledge of animation and illustrate the principles of animation and • ways to handle the video with the help of Multimedia tools.
CO4	• Explain and discuss the stage of Multimedia, hardware and software needs of Multimedia
CO5	• Describe the Multimedia production Team.
CO6	• Sketch out the concept of Planning and costing, Scheduling, designing and producing and content and talent.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	2	3	2	3	3
CO2	3	2	3	2	3	2
CO3	3	2	2	2	3	2
CO4	3	3	3	3	2	3
CO5	3	2	3	2	3	3
CO6	3	3	2	3	3	3

3-Strong 2-Medium 1-Low

Sl No.	**Contents of Module**	**Hrs**	**Cos**

1	Multimedia Definition — Use of multimedia — Delivering Multimedia -Text: About Font and Faces — Using text Multimedia - Computers and Text — Font editing and Design Tools — Hypermedia and hypertext.	**10**	**CO1**
2	Images: Plan Approach _ Organize Tools — Configure Computer Workspace — Making Still Images ~ Color — Image File Formats. Sound: The Power of sound - Digital audio — Midi Audio — midi vs. Digital Audio - Multimedia system sounds — Audi file formats — Vaughan's Law of Multimedia Minimums — Adding, sound to Multimedia project.	**15**	**CO2**
3	Animation: The power of motion- Principle of Animation- Animation by Computer — Making Animations that Work. Video: Using video — Working with video and displays ~ Digital video containers — Obtaining video clips ~ Shooting and Editing Video	**10**	**CO3**
4	Making Multimedia: The stage of Multimedia Project — The intangible Needs — The Hardware Needs — The software needs - An Authoring System's Needs. Multimedia Productions Team.	**10**	**CO4**
5	Planning and Costing: The process of Making Multimedia — Scheduling _Estimating — RFPs and Bid Proposals. Designing and Producing — Content and Talent: Acquiring Content — Ownership of content Created for Project — Acquiring	**15**	**CO5**

TEXTBOOK:

1. S. Gokul, "Multimedia Magic", Revised and updated Second Edition, 2008, BPB.
2. Tay Vaughan, "Multimedia: Making It Work", Eight Edition 2011, Tata McGraw -Hill.

REFERENCE BOOKS:

1. Ralf Steinmetz & Klara Nahrstedt, "Multimedia Computing, Communication & Applications", First Edition, 2008, Pearson Education.
2. Ranjan Parekh, "Principles of Multimedia", First Edition, 2008, Tata McGraw-Hill.
3. Richard E.Mayer, "Multimedia Learning", Second Edition, 2009, Cambridge University Press.
4. Glencoe, "Introduction to Multimedia", Student Edition, 2006, Tata McGraw-Hill.

E- REFERENCES:

1. www.tutorialfind.com/tutorials/multimedia
2. www.pdftutorials.com/multimedia/multimedia

FIFTH SEMESTER

Course Title: CORE PRACTICAL P V- RDBMS LAB

(For Students admitted from 2018 onwards)

Course Code	**:1815519**	**Credits**	**: 03**
L: T:P:S	**: 0:0:5:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To make the student aware of the Back-End tool*.

Lab Exercises:

1. DDL commands.
2. Specifying constraints-primary key, foreign key, unique, check, not null.
3. DML commands.
4. Joins.
5. Sub queries.
6. Creation of simple PL/SQL block using control constructs.
7. Creation of PL/SQL blocks using exceptional handlers.
8. PL/SQL program using implicit and explicit cursor.
9. PL/SQL program using procedures.
10. PL/SQL program using triggers.
11. Data Manipulation using PL/SQL.

FIFTH SEMESTER

Course Title: CORE PRACTICAL ELECTIVE II P VI- ASP. NET LAB
(For Students admitted from 2018 onwards)

Course Code	**: 1815520**	**Credits**	**: 03**
L:T:P:S	**: 0:0:5:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

To make students implement the concepts of ASP.Net.

Lab Exercises:

1. Create a Website that contains various standard controls
2. Create a Website that demonstrates use of validator controls
3. Create a Website that contains ad rotator and calendar controls.
4. Create a web application using web services.
5. Create a web application for storing and accessing database.
6. Create a web application for maintaining user states (Cookies etc.)

FIFTH SEMESTER

Course Title: CORE PRACTICAL ELECTIVE II - ADVANCED JAVA PROGRAMMING LAB

(For Students admitted from 2018 onwards)

Course Code	**:1815520**	**Credits**	**: 04**

L: T:P:S	**: 0:0:5:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To improve the programming skills of the students with respect to advance concepts of Java and to make the students to cop up with the latest programming concepts.*

Lab exercises:

1. HTML to Servlet Applications
2. Applet to Servlet Communication
3. Designing online applications with JSP
4. Creating JSP program using JavaBeans
5. Working with Enterprise JavaBeans
6. Performing Java Database Connectivity.
7. Creating Web services with RMI.
8. Creating and Sending Email with Java
9. Building web applications

FIFTH SEMESTER

Course Title: CORE PRACTICAL ELECTIVE II - MULTIMEDIA LAB
(For Students admitted from 2018 onwards)

Course Code	**: 1815520**	**Credits**	**: 03**

L: T:P:S	**: 0:0:5:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

To make students implement various Multimedia applications.

Lab exercises:

FLASH

1. To Move an object, to move an object in the path.
2. Text flips, Text color change.
3. Creating a link using texts and objects, Change the color of the object.
4. Shape Tweening and using shape hints, Motion Tweening, Hybrid Tweening.
5. Character animation, Object animation, Drawing Images.
6. An Application to show the Masking effect.
7. Slide show presentation.

PHOTOSHOP

1. To create a Greeting card, Create background picture.
2. Text effects, Photo effects.
3. Color, Buttons.
4. Editing Images.
5. Designing Webpage.

DREAMWEAVER

1. Text Management.
2. Tables- Layers.
3. Creating Menu bar.
4. Creating pages and Sites.
5. Animation in Images.

SIXTH SEMESTER

Course Title: CORE THEORY T XIII -PROGRAMMING IN PHP
(For Students admitted from 2018 onwards)

Course Code	**: 1815621**	**Credits**	**: 04**
L: T:P:S	**: 4:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To make students understand the concepts of PHP Programming.*
- *To make the students learn best practices in programming approach*
- *Enable the students to create attractive web pages using hypertext*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Learn the basics of PHP • Do simple program • Know How to utilize the predefined string and numeric functions
CO2	• Work with arrays and functions • Do programs on arrays and functions • Work with Time and date functionalities
CO3	• Learn advanced OOPs concept • Do programs on UDF
CO4	• Work with files and Learn file management concept • Learn cookies management • Learn session management
CO5	• Work with MySQL • Synchronize various queries and process them on php. • Work with character, numeric, date and time.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	2	2	2	3
CO2	3	3	3	3	3	3
CO3	3	3	3	2	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	2	3	2

3-Strong 2-Medium 1-Low

Sl No.	**Contents of Module**	**Hrs**	**COs**
1	Checking variables Data types – Using Constants – Manipulating Variables with Operators. Controlling Program Flow: Writing Simple Conditional Statements - Writing	**15**	CO1

	More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.		
2	Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.	**10**	CO2
3	Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts.	**10**	CO3
4	Working with Files and Directories: Reading Files-Writing Files- Processing Directories – Cookies – Session Management.	**10**	CO4
5	Working MySQL with PHP-database connectivity- Usage of MYSQL commands in PHP - Processing result sets of queries- Validating user input through Database layer and Application layer- Formatting query output with Character, Numeric, Date and time.	**15**	CO5

TEXT BOOKS:

1. **Vikram Vaswani,** "PHP A Beginner's Guide", McGraw-Hill
2. **Vikram Vaswani,** "How to Do Everything with PHP and MySQL", McGraw-Hill/Osborne

REFERNCE BOOKS:

1. **Rasmus Lerdorf, Kevin Tatroe**"Programming PHP", O'Reilly, ISBN 1565926102.
2. **Leon Atkinson** "Core PHP Programming", Prentice Hall, ISBN0130463469.
3. **W. Jason Gilmore,** "Beginning PHP5 and MySQL: From Novice to Professional", 2004, Apress, ISBN:1-893115-51-8
4. **Steven Holzner**, "The PHP Complete Reference", Tata McGraw-HillEdition.
5. **Steven Holzer**, "Spring into PHP5", Tata McCraw HillEdition
6. **Robin Nixon O'Reilly**, "PHP, MySQL, and JavaScript: A Step-By-Step Guide to Creating Dynamic Websites by Media", Firstedition

E-REFERENCES:

1 http://www.tutorialspoint.com/php/
2. http://www.w3schools.com/php/

SIXTH SEMESTER

Course Title: CORE THEORY T XIV -PYTHON PROGRAMMING
(For Students admitted from 2018 onwards)

Course Code	**: 1815622**	**Credits**	**: 04**
L: T:P:S	**: 4:1:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To make students understand the concepts of PYTHON programming.*
- *To apply the OOPs concept in PYTHON programming.*
- *To make the students learn best practices in PYTHON programming.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Learn the basics of PYTHON • Do simple programs on python • Utilize the control statement and recursion
CO2	• Work with Looping statements • Do programs on Loops and String methods • Do programs on Various string operations
CO3	• Learn string, list slices and dictionaries • Do work with reverse lookup • Learn in depth about Global variable utilization
CO4	• Work with files and Learn file management concept • Learn Immutable • Learn Dictionary and tuple management
CO5	• Learn Classes and Objects. • Do programs on OOPs concept in Python

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	3	2	2	3
CO2	3	3	2	3	3	3
CO3	3	3	2	2	3	3
CO4	3	2	2	3	3	3
CO5	3	2	3	3	3	3

3-Strong 2-Medium 1-Low

Sl No.	**Contents of Module**	**Hrs**	**COs**

1	Introduction to Python – Values and types – Variables – Variable names and keywords – Operators and Operands-Expressions and Statements-Order of Operations- Comments. Functions: Function calls- Type conversion functions-Math functions – Definitions and uses_ Parameters and arguments- Local variables and parameters- Fruitful functions. Conditionals and Recursion: Modulus operator – Boolean expressions – Logical operators- Conditional execution – Alternative execution- Chained Conditionals-Nested Conditionals-Recursion.	**15**	CO1
2	Iteration-Multiple Assignment-Updating variables-While statement- break- String – Len-String slices- Looping and counting- String methods-in operator-String comparison.	**10**	CO2
3	Lists: List operations-list slices-list methods-Deleting Elements-Lists and strings-Dictionaries: Dictionary as a set of counters-Looping and dictionaries-Reverse lookup-Global Variables.	**10**	CO3
4	Tuples: Immutable-Tuple Assignment-Tuples as return values- Lists and tuples-Dictionaries and tuples. Files: Reading and writing-Format operator- Filenames and Paths- Catching exceptions.	**10**	CO4
5	Classes and Objects: User-defined types-Attributes- Instances as return values. Classes and functions: Time-Pure Functions-Modifiers. Classes and methods: Object oriented features-init method-str method-Operator overloading- Polymorphism- Inheritance- Class diagrams- Data encapsulation.	**15**	CO5

TEXT BOOK:

1.Allen B. Downey O'Reilly "Think Python: How to Think Like a Computer Scientist", Second Edition, 2015, O'Reilly Media,Inc.

REFERENCE BOOK:

1. Jeff McNeil, "Python 2.6 Text Processing: Beginners Guide ", PacktPub Publications.
2. Mark Pilgrim,"Dive Into Python" , Academic Press.

E- REFERENCES:

1.http://www.greenteapress.com/thinkpython/thinkpython.pdf

SIXTH SEMESTER

Course Title: CORE THEORY T XV- SOFTWARE ENGINEERING
(For Students admitted from 2018 onwards)

Course Code	**: 1815623**	**Credits**	**: 04**
L: T:P:S	**: 5:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *Knowledge of basic SW engineering methods and practices, and their appropriate application.*
- *Describe software engineering layered technology and Process framework.*
- *The role of project management including planning, scheduling, risk management.*
- *Strategies of software testing.*
- *Knowing quality control and how to ensure good quality software.*
- *Ability to analyze, design, verify, validate, implement, apply, and maintain software systems*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Fundamental knowledge of software engineering. • Apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment Know software process models such as the waterfall, incremental, evolutionary models and concurrent models.
CO2	• Acquire requirements and Analyze it to design software designing through UML language.
CO3	• Design process, design concept and design models • Basic design principles and its components
CO4	• Good quality of software achieved through SQA. • Strategies of various software testing. • Methods of software testing.
CO5	• Role of software configuration management. Software Risk and its solution through RMMM. • Restructure of software-by-software reengineering and software reverse engineering

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO 6**
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	2	2	3	2	3	3
CO4	3	3	3	2	3	3
CO5	3	2	2	3	2	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	COs
1	The Nature of Software - Definition: Software, Software Engineering - Prescriptive Process Models- Prescriptive Process Models - The Waterfall Model - Incremental Process Model - Evolutionary Process Models - Concurrent Models	**10**	CO1
2	Requirements Analysis - Scenario-Based Modeling - UML Models That Supplement the Use Case - Data Modeling Concepts - Class-Based Modeling - Requirements Modeling Strategies - Flow-Oriented Modeling - Creating a Behavioral Model	**10**	CO2
3	The Design Process - Design Concepts - The Design Model - Designing Class-Based Components: Basic Design Principles - Component-Level Design Guidelines - Cohesion – Coupling - Designing Traditional Components - Graphical Design Notation - Tabular Design Notation - Program Design Language	**15**	CO3
4	Elements of Software Quality Assurance - SQA Tasks, goals, and metrics - Software Testing Strategies - Unit Testing - Integration Testing - Validation Testing - Alpha and Beta Testing - System Testing – The Debugging Process - White-Box Testing - Basis Path Testing - Control Structure Testing - Black-Box Testing	**15**	CO4
5	Software Configuration Management - The SCM Repository - The SCM Process - Risk Management - Software Risks - Risk Identification - Risk Projection - Risk Refinement - Risk Mitigation, Monitoring, and Management - The RMMM Plan - Software Maintenance- Software Supportability – Software Reengineering - Reverse Engineering	**10**	CO5

TEXT BOOKS:

1. Roger S. Pressman, “Software Engineering - A practitioner’s Approach”, 7th edition, 2001, Tata McGraw-Hill International Edition.

REFERENCE BOOKS:

1.IanSommerville, “Software Engineering”, 6th edition, 2000, Pearson education Asia.

2.Richard E. Fairley, “Software Engineering Concepts”, 2002, Tata McGraw- Hill edition.

E-REFERENCE:

1. http://ceit.aut.ac.ir/~91131079/SE2/SE2%20Website/Lecture%20Slides.html

SIXTH SEMESTER

Course Title: CORE THEORY T XV-DATA MINING
(For Students admitted from 2018 onwards)

Course Code	**: 1815624**	**Credits**	**: 05**
L: T:P:S	**: 5:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To make students understand the concepts of DATAMINING*
- *To apply the DATA MINING concept in the real-world scenario*
- *To encourage the students to do research in DATAMINING*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Understand the basics of DM • Learn about databases in DM • Learn about knowledge discovery in DM
CO2	• Work with DM techniques • Learn about Statistical Prospective on DM • Understand Decision Trees/Neural Networks/Genetic Algorithm
CO3	• Learn about different types of algorithm in DM • Work with Statistical Based, Distance based algorithms • Work with Decision trees/Neural Network/Rule based
CO4	• Apply Hierarchical and Partitional algorithm • Learn about Similarity and Distance Measures • Understand various algorithm technique
CO5	• Learn about large item sets in DM • Apply incremental rules and Measuring quality rules • Understand about applying various rules applying methods

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO 5**	**PSO6**
CO1	3	3	3	2	2	3
CO2	3	3	3	3	3	3
CO3	3	3	3	2	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	COs
1	Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Matrices – Social Implications of Data Mining – Data Mining from Data Base Perspective.	**15**	CO1
2	Data Mining Techniques – a Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.	**10**	CO2
3	Classification: Introduction – Statistical – Based Algorithms – Distance Based Algorithms – Decision Tree – Based Algorithms – Neural Network Based Algorithms – Rule Based Algorithms – Combining Techniques.	**10**	CO3
4	Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms, Partitional Algorithms.	**10**	CO4
5	Association Rules: Introduction - Large Item Sets – Basic Algorithms – Parallel & Distributed Algorithms – Comparing Approaches – Incremental Rules – Advanced Association Rules Techniques – Measuring the Quality of Rules.	**15**	CO5

TEXT BOOK:

1. **Margaret H.Dunbam**, "Data Mining Introductory and Advanced Topics", 2003, Pearson Education.

REFERENCE BOOK:

1. **Jiawei Han & Micheline Kamber**, "Data Mining Concepts & Techniques", 2001 Academic Press.

E- REFERENCES:

1.http://books.google.co.in/books?id=O6F9iwsqZQwC&pg=PA13&source=gbs_selectedpages&cad=3#v=onepage&q&f=false

SIXTH SEMESTER

Course Title: CORE THEORY Elective III-DIGITAL IMAGE PROCESSING (For Students admitted from 2018 onwards)

Course Code	**:1815624**	**Credits**	**: 05**
L: T:P:S	**: 5:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *To study the image fundamentals and mathematical transforms necessary for image processing.*
- *To study the image enhancement techniques*
- *To study image restoration procedures.*
- *To study the image compression procedures.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Review the fundamental concepts of a digital image processing system. • Understand the need for color models for images.
CO2	• Learn different techniques employed for the enhancement of images. • Understand the need for image compression and to learn the spatial domain.
CO3	• Evaluate the techniques for image enhancement. • Analyze images in the frequency domain using various transforms.
CO4	• Evaluate the techniques for image enhancement and image restoration. • Learn different causes for image degradation and overview of image restoration techniques.
CO5	• Interpret image compression standards. • Learn basics of predictive and transform coding.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO 1	**PSO 2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	3	2	3	3
CO2	3	3	3	2	2	3
CO3	2	3	3	2	2	3
CO4	2	2	3	2	3	3
CO5	3	3	3	2	2	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	Cos
1	Introduction – steps in image processing, Image acquisition, representation, sampling and quantization, relationship between pixels. – color models – basics of color image processing	**10**	**CO1**
2	Image enhancement in spatial domain – some basic gray level transformations – histogram processing – enhancement using arithmetic, logic operations – basics of spatial filtering and smoothing.	**15**	**CO2**
3	Image enhancement in Frequency domain – Introduction to Fourier transform: 1-D, 2–D DFT and its inverse transform, smoothing and sharpening filters.	**10**	**CO3**
4	Image restoration: Model of degradation and restoration process – noise models – restoration in the presence of noise- periodic noise reduction. Image segmentation: Thresholding and region-based segmentation.	**15**	**CO4**
5	Image compression: Fundamentals – models – information theory – error free compression – Lossy compression: predictive and transform coding. JPEG standard	**10**	**CO5**

TEXT BOOK:

1. R.C. Gonzalez, R.E.Woods, "Digital Image processing", Second Edition, Pearson Education.2002.

REFERENCE BOOK:

1. Anil K. Jain, "Fundamentals of Digital Image Processing", Second Edition, Prentice Hall of India, New Delhi. 1994.
2. Pratt. W.K., "Digital Image Processing, Third Edition", John Wiley & Sons. 1978.
3. Rosenfled A. &Kak, A.C, "Digital Picture Processing", Voll& II, Academic, 1982

E-REFERENCES:

1. http://web.ipac.caltech.edu/staff/fmasci/home/astro_refs/Digital_Image_Processing_2ndEd.pdf

SIXTH SEMESTER

Course Title: CORE ELECTIVE III –UNIFIED MODELING LANGUAGE
(For Students admitted from 2018 onwards)

Course Code	**: 1815624**	**Credits**	**: 05**
L: T:P:S	**: 5:0:0:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

- *The basic skill to be learned in this class is analysis of a system in some application domain.*
- *It develops its corresponding object-oriented model.*
- *The tool we will use to do the modeling is the Unified Modeling Language (UML).*
- *Formulated in the past decade, UML is becoming an industry standard. Basically, it is a graphical tool used to draw a blueprint that is translated into software.*
- *Designing the software system is the second goal of the class.*

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Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Recognize the concepts and principles of object-oriented programming concept • Modeling design Technique, Three models, Class Model, State model and Interaction model.
CO2	• The Structural things define the static part of the model. • They represent physical and conceptual elements. • The class and object diagrams give the structural view of system.
CO3	• Understand the purposes, major components and key mechanisms of Class and Object Diagram. • A behavioral thing consists of the dynamic parts of UML models
CO4	• Knowledge on State-chart Diagram. • Develop, explore the conceptual model into various scenarios and applications. • Present the transition from business events to use cases
CO5	• Apply the concepts of architectural design for deploying the code for software.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	2	3	3	3
CO2	3	3	3	3	3	2
CO3	3	3	2	2	3	2
CO4	3	3	3	2	3	3
CO5	3	2	3	2	3	3

3-Strong 2-Medium 1-Low

Sl No.	Contents of Module	Hrs	COs
1	Introduction to UML: Importance of modeling, principles of modeling, object-oriented modeling, conceptual model of the UML, Architecture	10	CO1
2	Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. Interfaces, Types and Roles, Packages. Class & Object Diagrams: Terms, Concepts, modeling techniques for Class & Object Diagrams.	15	CO2
3	Basic Behavioral Modeling: Interactions, Interaction diagrams. Use cases, Use case Diagrams, Activity Diagrams	15	CO3
4	Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.	10	CO4
5	Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.	10	CO5

TEXT BOOK:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, 2005, The Unified Modeling LanguageUser Guide, Pearson Education.
2. Hans-Erik Eriksson, 2003, Magnus Penker, Brian Lyons, David Fado: UML Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCE BOOK:

1. Pascal Roques, Modeling Software Systems Using UML2, WILEY-DreamtechIndiaPvt. Ltd.
2. Atul Kahate,Object Oriented Analysis & Design, The McGraw-Hill Companies.
3. Mark Priestley, Practical Object-Oriented Design with UML,TATAMcGrawHill.

E-REFERENCES:

1. https://www.utdallas.edu/~chung/Fujitsu/UML_2.0/Rumbaugh--UML_2.0_Reference_CD.pdf

SIXTH SEMESTER

Course Title: CORE PRACTICAL P VII - PHP AND PYTHON PROGRAMMING LAB
(For Students admitted from 2018 onwards)

Course Code	**: 1815625**	**Credits**	**: 03**
L:T:P:S	**: 0:0:5:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:

To make students implement the basic concepts of PHP and PYTHON.

Lab Exercises

PHP

1. Write a PHP script to implement String, Numeric, Date and Time functions.
2. Write a PHP script using Indexed, Associative and Multidimensional arrays.
3. Write a server-side PHP script that displays marks, total, grade of a student in tabular. format by accepting user inputs for name, number and marks from a HTML form [Do not use database].
4. Write a PHP script using two buttons to store Cookies and read Cookies' details.
5. Write a PHP script to demonstrate Session.
6. Write a PHP script to upload a file from client machine to the server machine.
7. Write a PHP script to create a directory, remove a directory and to read contents from the directory using choice menu.
8. Create a MySQL table and execute queries to read, add, remove and modify a record from that table.
9. Write a PHP script to access the employee data stored in a MySQL table. Use EmpNumber as input from a Form.

PYTHON

1. Program using Function.
2. Program using Recursive Function.
3. Program using Control Statements.
4. Program using Strings.
5. Program using Lists, Dictionaries and Tuples.
6. Program using Files.
7. Program using Classes and Objects.

SIXTH SEMESTER

Course Title: CORE PROJECT P VIII -MINI PROJECT WORK
(For Students admitted from 2018 onwards)

Course Code	**: 1815626**	**Credits**	**: 05**
L: T:P:S	**: 0:0:5:0**	**CIA Marks**	**: 40**
Exam Hours	**: 03**	**ESE Marks**	**: 60**

Course Objectives:
Students will be able to:

- *Implement the solution for the chosen problem using the concepts and the techniques learnt in the curriculum.*
- *Develop software applications*
- *Record the research results for a given problem*
- *Identify, formulate and implement computing solutions.*
- *Design and conduct experiments, analyze and interpret data.*
- *Analyze a system, component or process as per needs and specification.*
- *Work on multidisciplinary tasks and will be aware of the new and emerging disciplines.*
- *Demonstrate skills to use modern tools, software and equipment to analyze problems.*

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	• Demonstrate a sound technical knowledge, skills and attitude of their selected project topic.
CO2	• Understand problem identification, formulation and solution.
CO3	• Design solutions to complex problems utilizing a systems approach.
CO4	• Communicate with engineers and the community at large in written and oral forms.

Mapping of Course Outcomes to Program Specific Outcomes:

	PSO1	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	3	3	2	3	3	3
CO2	3	3	3	2	2	3
CO3	3	3	3	2	3	3
CO4	2	3	3	3	3	3

3-Strong 2-Medium 1-Low

Procedure:

- The Head of the Department will assign an Internal Guide for each student.
- As soon as the student gets project, the student should submit the contact details of the organization to their guide.
- During regular intervals, student should report about his/her progress of the project work.
- After the submission of the final report, an external examiner will evaluate the project document and conduct the viva -voce examination.

********End of Sixth Semester********