

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

M.Sc COMPUTER SCIENCE

(Students admitted during 2018 – 2019 Onwards)

(Under CBCS with Outcome Based Education (OBE) Pattern)

SYLLABUS



H.H. THE RAJAH'S COLLEGE

(Government Autonomous Co-educational Institution,

Affiliated to Bharathidasan University, Trichy)

PUDUKKOTTAI – 622 001.

H.H THE RAJAH'S COLLEGE (AUTONOMOUS) - PUDUKKOTTAI

M.Sc COMPUTER SCIENCE (2020 – 2021)

S.N O	SE M	PAPE R	SUB.CODE	SUBJECT	HOURS/WEEK	CREDI T	EXAM HOUR S	MARKS		
								INTERNA L	EXTERNA L	TOTA L
1	I	CC-I	18PCS1	Compiler Design	7	5	3	25	75	100
2	I	CC-II	18PCS2	Advanced Java Programming	7	5	3	25	75	100
3	I	CP-III	18PCS3P	Advanced Java Lab.	7	5	3	40	60	100
4	I	EC-I	18PCSE1	Human Computer Interaction (OR)	7	5	3	25	75	100
				Embedded Systems						
5	I	EDC-I	18PCSED1 OBJECTIV E TYPE	General Studies for Competitive Examinations	2	-	-	-	-	
					30	20	-	-	-	400
6	II	CC-IV	18PCS4	Distributed Operating Systems	6	5	3	25	75	100
7	II	CC-V	18PCS5	Data Mining and Data Warehousing	5	5	3	25	75	100
8	II	CC-VI	18PCS6	Programming in Python	6	5	3	40	60	100
9	II	CP-VII	18PCS7P	Programming in Python Lab	5	5	3	25	75	100
10	II	EC-II	18PCSE2	Advanced Microprocessor & Microcontrollers (OR)	5	5	3	25	75	100
				Artificial Intelligence						
	II	EDC-I	18PCSED1 OBJECTIV E TYPE	General Studies for Competitive Examinations	3	5	3	25	75	100
					30	30	-	-	-	600
11	III	CC-VIII	18PCS8	Cloud Computing	6	5	3	25	75	100
12	III	CC-IX	18PCS9	Advanced Network Security	6	5	3	25	75	100
13	III	CC-X	18PCS10	Proramming in ASP.Net	6	5	3	40	60	100
14	III	CP-XI	18PCS11P	Proramming in ASP.Net Lab	6	5	3	25	75	100
15	III	EC-III	18PCSE3	Unified Modelling Language (OR)	6	5	3	25	75	100
				Computer Simulation and Modeling						
					30	25	-	-	-	500
16	IV	CC-XII	18PCS12	Web Services	6	5	3	25	75	100
17	IV	CC-XIII	18PCS13	Software Project Management	6	5	3	25	75	100
18	IV	PW-I	18PCS14	Project Work	12	5	-	25	75	100
					24	15	-	-	-	300
Grand Total					114	90	-	-	-	1800

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; K2- Understanding; K3- Apply; K4-Analyze; K5- Evaluate

1. Theory: 75 Marks

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	$10 \times 2 = 20$	Very Short Answers	75
K2	B (Either Or)	$5 \times 5 = 25$	Short Answers	
K3 & K4	C (3 out of 5)	$3 \times 10 = 30$	Descriptive / Detailed	

2. Practical Examinations: 60 Marks

Knowledge Level	Section		Total
	Practical	Record Work	
K3	50	10	60
K4			
K5			

PROGRAM OBJECTIVES:include:

1. To prepare and motivate graduates with recent technological developments related to core subjects like programming, databases, open source technologies, design of compilers, mobile computing and network security aspects and future technologies.
2. To encourage students for higher studies, research activities and technically competent to excel in IT industry by imparting interactive quality teaching and organizing various activities.
3. To inculcate the ability for designing, developing, analyzing, testing and implementing various software applications.
4. To train the graduates to have basic interpersonal skills and sense of social responsibility that paves them a way to become good team members and leaders.
5. To be able to adapt to change career opportunities and learn to effectively communicate ideas in oral and written form to cope up with evolving technical challenges.

PROGRAM OUTCOMES (POs)

PO1: Acquire sound knowledge in computer science including theory, programming, algorithms, databases and web development.

PO2: Ability to adopt knowledge to develop solutions using Information technology.

PO3: Design and develop computer based applications related to current emerging technologies.

PO4: Apply professional skills in software design process and practical competence in broad range of open source programming languages to withstand technological change and provide solutions to new ideas and innovations.

PO5: Create socially acceptable technical solutions to complex computer science problems with the application of emerging techniques for sustainable development relevant to professional computer based practice.

COMPILER DESIGN**OBJECTIVES**

- To Learn the Concept of Compiling
- To Understand the Basics of Compilers
- To Learn the various Parts and Working of Compilers

UNIT I

Introduction to Compilers - Compilers and Translators - Assembly language – Macros - Structure of compiler - Compiler writing tools - Bootstrapping. Lexical Analysis - Role of Lexical Analyzer - Regular Expression - finite Automata - Implementation of lexical analyzer - Context Free Grammar - Derivation and Parse tree

UNIT II

Parsers - Shift reduce parsing - Operator precedence parsing - Top down parsing - predictive parsers - LR parsers - construction SLR parser tables – Constructing canonical LR parsing table - construction LALR parsing tables

UNIT III

Syntax directed translation schemes - Implementation of syntax directed translation schemes - Intermediate code – Postfix notation – parse tree and syntax tree – Three address code, quadruples and tuples – Translation of assignment statements - Boolean expression

UNIT IV

Symbol table - The contents of a symbol table - Data structures for symbol tables - Implementation of a simple stack allocation scheme - Storage allocation in Block Structured Languages. Errors - Lexical phase errors – Syntactic phase errors-Semantic errors

UNIT V

Code optimization - principal sources of Optimization - Loop Optimization - Machine dependent optimization – DAG representation in Basic Blocks. Code generation - Problems in code generation - A simple code generator - Register allocations and assignment - code generation from DAG's - Peephole optimization

TEXT BOOK

A.V Aho and J .D Ullman, “The Principles of Compiler Design” Narosa Publishing House,1987

UNIT I: Chapter 1, 3, 4; UNIT II: Chapter 5, 6; UNIT III: Chapter 7
 UNIT IV: Chapter 9, 10, 11; UNIT V: Chapter 12, 15

REFERENCE BOOK

Reinhardwilhm , Director Mauser “Compiler Design”,1995, Addison Wesley

- [HTTPS://WWW.TUTORIALSPOINT.COM/COMPILER_DESIGN/INDEX.HTM](https://www.tutorialspoint.com/compiler_design/index.htm)

Outcomes:

- CO1:** Would have learnt to use compilers
- CO2:** Would have learnt the parsing techniques
- CO3:** Would have learnt the Syntax directed translation schemes
- CO4:** Learnt the usage of symbol table.
- CO5:** Able to relate and implement code optimization.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	L
CO2	S	M	M	S	M
CO3	S	S	L	M	M
CO4	S	S	M	M	M
CO5	M	S	M	M	L

S: Strong; **M:** Medium; **L:** Low;

CORE COURSE – II

ADVANCED JAVA PROGRAMMING**OBJECTIVES**

- To Understand the OOPs Concept
- To Visualize the OOPs Concepts
- To Program Advanced OPPs Concepts using Java

UNIT I : Fundamentals of Object Oriented Programming - Overview of Java Language – Introduction to classes – Class Fundamentals – declaring objects – Constructors – Methods – Overloading Methods – Inner classes – Inheritance – Method Overriding – Packages – Interfaces.

UNIT II: Exception Handling – Types of Exception – Try and Catch – Nested Try – Throw and Throws – Multithreading – Thread Priorities – Main Thread – Synchronization.

UNIT III : AWT classes – Window fundamentals –AWT Controls – Labels – Buttons – Menus – Handling Events by Extending AWT Components – Applet class – Applet Architecture – The HTML applet tag- Passing Parameters in Applets.

UNIT IV :Networking – Networking basics- Java and the Net – Inet Address – TCP/IP Client sockets – URL – URL Connection – TCP/IP Server Sockets – A catching proxy HTTP Server – Datagrams.

UNIT V : Java database Connectivity – JDBC /ODBC bridge – Java SQL package – JDBC exception Class – Connection to remote database – Data manipulation – Data navigation – Introduction to Java Remote Method Invocation (RMI) – Java servlets – Introduction to Java Beans.

TEXT BOOKS

1. Java2 complete Reference, Herbert Schildt, Tata McGraw Hill, Fourth Edition, 2001.
2. Java2.0 (Web enabled commercial application development)Ivan Bayross – BPB publications Indian Edition 2000 (Chapters 11,13,14 and 16 only)

REFERENCE BOOK

Java 2, Swing, Servelets, JDBC & JAVA Beans Programs - Black Book, Steven Holzner.

- <http://www.learnjavaonline.org/>

Outcomes:

CO1: Would have learnt the fundamentals of Java

CO2: Would have learnt the usage of Exception handling

CO3: Would have learnt Database connectivity

CO4: Should have learnt the basics of network programming using Java

CO5: Usage of AWT in programming would have been learnt.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – 1 Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – 1 Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	L	L
CO2	S	M	L	L	S
CO3	S	M	S	M	L
CO4	M	M	S	S	M
CO5	M	S	S	M	L

S: Strong; **M:** Medium; **L:** Low;

CORE COURSE -III PRACTICAL
ADVANCED JAVA LAB

1. Simple Programs
2. Constructors and Destructors
3. Inheritance
4. Method Overloading
5. Packages and Interface
6. Exception Handling
7. Multi Threading
8. AWT Class and Applet
9. Network Socket Programs
10. Database Connectivity
11. RMI Concepts
12. Servlet Concept
13. Java Beans

HUMAN COMPUTER INTERACTION**OBJECTIVES**

- To Understand Human Computer Interaction
- To Understand the Various HCI Paradigms
- To Learn the Implementation of Human Computer Interaction

UNIT I

Introduction: What is HCI - The Human: Input – Output Channel. The Computer: Text Entry devices – positioning pointing and drawing - The Interaction: Models of Interaction design focus: Video recorder – Frameworks and HCI – Ergonomics – Interaction – Styles – Elements of the WIMP interface – Interactivity – The context of the interaction – Experience, Engagement and fun.

UNIT II

Paradigms: Introduction – Paradigms for interactions. Interaction design basics: Introduction – What is design – The process of design – User focus – scenarios – navigation design – screen design and layout – Iteration and prototyping.

UNIT III

HCI in the software process: Introduction – The software life cycle – Usability Engineering – Interactive design and prototyping – design rationale. Design Rules: Introduction – Principles to support usability – Standards – Guidelines – Golden rules and heuristics – HCI patterns.

UNIT IV

Implementation Support: Introduction – Elements of windowing system – Programming the application – Using Toolkits – User Interface management systems. Evaluation techniques: What is Evaluation – Goals of Evaluation – Evaluation through expert analysis – Evaluation through user participation – Choosing an evaluation method

UNIT V

Universal Design: Introduction – Universal design principles – Multi Modal Interaction - Designing for diversity. User Support: Introduction- Requirements of user support – Approaches to user support – Adaptive to user support – Adaptive help system – Designing user support systems.

TEXT BOOK

“Human –Computer Interaction”, Alan Dix, Janet Finlay, Gregory D. Abowd, Russell Beale, Pearson Education, Ltd Third Edition

UNIT I: Chapter 1.1, 1.2, 2.1 – 2.3, 3; UNIT II: Chapter 4, 5; UNIT III: Chapter 6, 7

UNIT IV: Chapter 8, 9; UNIT V: Chapter 10, 11

REFERENCE BOOK

“The Human- Computer Interaction Handbook” – Andrew sears, Julie A.Jacko- CRCPress, Technology & Engineering. Sep- 2007.

- <https://www.interaction-design.org/courses/human-computer-interaction>

Outcomes:

CO1: Would have learnt the interaction between Human and Computer

CO2: Would have learnt the importance of User Interface

CO3: Would have learnt the importance of support

CO4: Would be able to implement support

CO5: Would be able to implement universal design.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – 1 Unit	11a (or) 11b – 1 Unit	16 – I Unit
3,4 – II Unit	12a (or) 12b – II Unit	17 – II Unit
5,6 – III Unit	13a (or) 13b – III Unit	18 – III Unit
7,8 – IV Unit	14a (or) 14b – IV Unit	19 – IV Unit
9,10 – V Unit	15a (or) 15b – V Unit	20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	L	M	M	L
CO2	S	S	M	L	S
CO3	S	M	M	S	L
CO4	S	S	S	S	M
CO5	M	S	S	L	L

S: Strong; **M:** Medium; **L:** Low;

EMBEDDED SYSTEMS

Objectives: To provide fundamental concept of Embedded systems and real time operating systems.

UNIT I Introduction to Embedded systems – processor in the system – software embedded into a system – structural units in a processor – processor, memory selection, Memory devices - Allocation of memory to program segments and blocks and memory map of a system.

UNIT II Device drivers – Interrupt servicing mechanisms – context and periods for context switching - Programming concepts and Embedded programming in C and C++: Software programming in ALP and in high level language ‘C’ – ‘C’ program elements: Header source files and preprocessor directives – Macros and functions: Data types – data structures – modifiers – statements – loops and pointers – Embedded programming in C++ and Java.

UNIT III Program modeling concepts in single and multiprocessor systems – software – development process: modeling process for software analysis – programming model for event controlled or response time constrained real time program- modeling of multiprocessor systems. Multiple processes – sharing data by multiple tasks and routines – inter process communications.

UNIT IV Real time operating systems: OS services – IO sub systems – Real time and embedded operating systems – Interrupt routines in RTOS environment – RTOS task scheduling models, Interrupt latency and response times of the task as performance metrics – performance metrics in scheduling models.

UNIT V Hardware Software code design: Embedded system project management – Embedded system design and Co-design Issues – Design Cycle – uses of target system – use of software tools for development – use of scopes and logic analysers for system hardware tests – issues in embedded system design.

TEXT BOOKS:

Embedded systems – Architecture, Programming and Design By Raj Kamal – TMH, 2007.

REFERENCE:

Mohamed Ali Maszidi & Janice Gillispie Maszidi, “The 8051 Microcontroller and Embedded System”, Pearson Publishers

- [HTTPS://WWW.TUTORIALSPPOINT.COM/EMBEDDED_SYSTEMS/INDEX.HTM](https://www.tutorialspoint.com/embedded_systems/index.htm)

Outcomes:

CO1: Would have learnt the importance of embedded system programming using microcontrollers

CO2: Would have learnt about device driver programming

CO3: Would have learnt the concepts of Real Time Operating Systems (RTOS)

CO4: Would be able to understand modelling concepts in single and multiprocessor systems.

CO5: Able to implement hardware and software code design.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit	11a (or) 11b – 1 Unit	16 – I Unit
3,4 – II Unit	12a (or) 12b – II Unit	17 – II Unit
5,6 – III Unit	13a (or) 13b – III Unit	18 – III Unit
7,8 – IV Unit	14a (or) 14b – IV Unit	19 – IV Unit
9,10 – V Unit	15a (or) 15b – V Unit	20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	L	L	M	M
CO2	L	L	L	S	S
CO3	L	L	S	M	M
CO4	L	L	M	S	S
CO5	M	S	S	L	L

S: Strong; **M:** Medium; **L:** Low;

CORE COURSE - IV
DISTRIBUTED OPERATING SYSTEMS

OBJECTIVES

- To Learn the Basics of Distributed computing
- To Learn the Concepts of Distributed Operating systems
- To Learn the Distributed File Systems

UNIT I

Fundamentals: evolution – System Models- Distributed Operating System – Issues – Distributed Computing environment. Message passing: Introduction – Features – Issues – Synchronization – Buffering – Message – Encoding – Decoding – process addressing – Failure Handling

UNIT II

Remote Procedure calls: Introduction – Model – Transparency – Implementation - Stub Generation - Messages - Marshaling Arguments and results- server Management - Parameter passing Semantics - Call Semantics - Communication Protocols- Complicated RPC's – Client -Server Binding - Exception handling – Security - Distributed Shared Memory – Introduction- Architecture – Issues - Granularity Structure - Consistency Models – Replacement Strategy – Thrashing

UNIT III

Synchronization: Introduction – Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock – Election Algorithms

UNIT IV

Resource Management: Introduction – Features – Task Assignment approach – Load Balancing Approach – Load –Sharing Approach process Management – Introduction – process Migration – Threads

UNIT V

Distributed File System: Introduction – Features – File Models – Accessing Models – Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles Naming – Introduction – Features – terminologies – Concepts

TEXT BOOK

Pradeep K. Sinha, "Distributed Operating Systems, Concepts and Design" Prentice Hall of India, New Delhi,2001.

UNIT I: Chapter 1, 3;

UNIT II: Chapter 4, 5;

UNIT III: Chapter 6

UNIT IV: Chapter 7, 8;

UNIT V: Chapter 9, 10

REFERENCE BOOK

Andrew S.Tanenbaum "Distributed Operating Systems", Pearson Education,Delhi,2002.

- <http://ecomputernotes.com/fundamental/disk-operating-system/distributed-operating-system>

Outcomes:

CO1: Would have learnt about Distributed OS

CO2: Would have learnt about Clock Synchronization and Resource management

CO3: Would have learnt about Distributed File System

CO4: Able to bring an understanding the resource management.

CO5: Able to implement remote procedure calls in Distributed operating systems.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit	11a (or) 11b – 1 Unit	16 – I Unit
3,4 – II Unit	12a (or) 12b – II Unit	17 – II Unit
5,6 – III Unit	13a (or) 13b – III Unit	18 – III Unit
7,8 – IV Unit	14a (or) 14b – IV Unit	19 – IV Unit
9,10 – V Unit	15a (or) 15b – V Unit	20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	L	L	M	M
CO2	S	M	M	M	L
CO3	M	L	M	S	S
CO4	S	M	L	M	L
CO5	S	M	L	M	L

S: Strong; **M:** Medium; **L:** Low;

CORE COURSE - V
DATA MINING AND DATA WAREHOUSING

OBJECTIVES

- To Understand the OLAP
- To Learn the Techniques of Data Mining
- To Learn the Basics of Web Mining

UNIT I

Multidimensional Data Model – OLAP operations – Warehousing Schema – Data Warehouse Architecture – Data Warehouse Implementation – Data Mining Applications.

UNIT II

Introduction: Basic data mining tasks – Data mining versus knowledge discovery in databases – Data mining issues – Related concepts-Data mining techniques: Introduction – A statistical perspective on data mining – similarity measures – Decision trees - Neural networks – Genetic algorithms.

UNIT III

Classification: Introduction – Statistical-based algorithms – Distance based algorithms-Decision Tree based algorithm – Neural network based algorithm – Rule based algorithms – Combing techniques. Clustering: Introduction – Similarity and Distance measures – Outliers – Hierarchical algorithm – Partitional Algorithm – Clustering large databases- Clustering with categorical attributes

UNIT IV

Association Rules: Introduction – Large item sets – Basic algorithms – Parallel and distributed algorithm – Comparing approaches – Incremental rules – Advanced Association Rule techniques – Measuring the quality of rules.

UNIT V

Web mining: Introduction – Web content mining – Web structure mining – Web usage mining.

Temporal mining: Introduction – Modeling temporal events – Time series – Pattern detection – Sequence – Temporal association rules.

TEXT BOOK

1. Jiawei Han and MichelineKamber, “Data Mining Concepts and Techniques”.

UNIT I: Chapter 3

2. Margaret H. Dunham “Data Mining”, Pearson Education.

UNIT II: Chapter 1- 3;

UNIT III: Chapter 4, 5;

UNIT IV: Chapter 6

UNIT V: Chapter 7, 8;

REFERENCE BOOK

“Introduction to Data Mining with Case Studies” – G.K. Gupta PHI Pvt Ltd

- https://www.tutorialspoint.com/data_mining/index.htm

Outcomes:

CO1: Would have learnt about Mining Data for meaningful knowledge

CO2: Would have learnt about the basics of data warehousing

CO3: Would have learnt the techniques of web mining

CO4: Would have learnt about association rules in data mining

CO5: Would have learnt about the implementation of classifications.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

COs \ POs	PO1	PO2	PO3	PO4	PO5
	CO1	L	L	M	S
CO2	S	L	L	M	L
CO3	L	M	M	S	S
CO4	L	S	S	M	M
CO5	S	L	M	L	M

S: Strong; **M:** Medium; **L:** Low;

PROGRAMMING IN PYTHON**OBJECTIVES**

- Identify functionalities of Programming languages
- Describe keywords, delimiters, literals, operators and identifiers
- Format strings and numbers
- Perform simple arithmetic operations
- Write simple and complex programs using Python.

Unit I

Python: Introduction – Numbers – Strings – Variables – Lists – Tuples – Dictionaries – Sets – Comparison.

Unit II

Code Structures: if, elif, and else – Repeat with while – Iterate with for – Comprehensions – Functions – Generators – Decorators – Namespaces and Scope – Handle Errors with try and except – User Exceptions.

Unit III

Modules, Packages, and Programs: Standalone Programs – Command-Line Arguments – Modules and the import Statement – The Python Standard Library. Objects and Classes: Define a Class with class – Inheritance – Override a Method – Add a Method – Get Help from Parent with super – In self Defense – Get and Set Attribute Values with Properties – Name Mangling for Privacy – Method Types – Duck Typing – Special Methods – Composition.

Unit IV

Data Types: Text Strings – Binary Data. Storing and Retrieving Data: File Input/Output – Structured Text Files – Structured Binary Files - Relational Databases – NoSQL Data Stores.

Unit V

Web: Web Clients – Web Servers – Web Services and Automation – Systems: Files – Directories – Programs and Processes – Calendars and Clocks.

TEXT BOOK:

1. Bill Lubanovic, "Introducing Python", O'Reilly, First Edition-Second Release, 2014.

UNIT I: Chapters 2 & 3;

UNIT II: Chapter 4;

UNIT III: Chapter 5 & 6

UNIT IV: Chapters 7 & 8;

UNIT V: Chapters 9 & 10

REFERENCE BOOKS

1. Mark Lutz, "Learning Python", O'Reilly, Fifth Edition, 2013.
2. David M. Beazley, "Python Essential Reference", Developer's Library, Fourth Edition, 2009.
 - <https://www.learnpython.org/>

Outcomes:

CO1: Would have learnt basic python programming

CO2: Would have familiarized with Spider IDE

CO3: Would have learnt the basics of Web Services Programming

CO4: Would have learnt to program modules

CO5: Would have learnt to use and implement data types in python.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	L	S
CO2	M	M	M	S	L
CO3	S	S	M	M	S
CO4	M	M	L	L	S
CO5	S	S	M	M	S

S: Strong; M: Medium; L: Low;

**CORE COURSE – VII PRACTICAL
PROGRAMMING IN PYTHON LAB**

1. Programs using elementary data items, lists, dictionaries and tuples
2. Programs using conditional branches, loops.
3. Programs using functions
4. Programs using exception handling
5. Programs using classes and objects
6. Programs using inheritance
7. Programs using polymorphism
8. Programs to implement file operations.
9. Programs using modules.
10. Programs for creating dynamic and interactive web pages using forms.
11. Program using database connection.
12. Program using web services.

Reference:

<https://www.sanfoundry.com/python-problems-solutions/>

ADVANCED MICROPROCESSORS & MICROCONTROLLERS**OBJECTIVES**

- To Learn the Architecture of 8086
- To Learn the Basics of X86 Processors
- To Learn the Basics of Micro Controllers

UNIT I

Register Organization of 8086 – Architecture – Signal descriptions of 8086- Minimum Mode 8086 system and timings – Maximum mode 8086 system and timings – Machine Language Instruction Format – Addressing Modes of 8086 – Instruction set of 8086 – Assembler directives and operators.

UNIT II

A few machine level programs – Machine coding the programs – Programming with an assembler – Assembly Language example programs-Introduction to stack – STACK structure of 8086 – Interrupts and Interrupts service Routines.

UNIT III

Salient Feature of 80286 – Internal Architecture of 80286 – Signal description of 80286 – Real Addressing mode – Protected Virtual Address Mode (PVAM) – Privilege – Protection – Special Operation – 80286 Bus Interface – Basic Bus Operations – Interfacing memory and I/O devices with 80286 – Bus HOLD and HLDA sequence – Interrupt acknowledge sequence – Instruction set features.

UNIT IV

PIO 8255 – Modes of Operations of 8255 - Programmable interval timer 8254 – Programmable Interrupt Controller 8259A – Keyboard/ Display Controller 8279 – Programmable communication Interface 8251 USART – DMA Controller 8257.

UNIT V

Architecture of 8051 – Signal Description of 8051 –Register set of 8051 – Important operational features of 8051 – Memory and I/O Addressing by 8051- Interrupts of 8051 – Instruction set of 8051 – Design of a microcontroller 8051 based length measurement system for continuously rolling cloth or paper.

TEXT BOOK

“Advanced Microprocessors and peripherals” A.K Ray and K.M Bhurchandi, TMH 2000

UNIT I: Chapter 1, 2;

UNIT II: Chapter 3, 4;

UNIT III: Chapter 9, 11

UNIT IV: Chapter 5, 6, 7;

UNIT V: Chapter 17

REFERENCE BOOKS

1. Programming and Customizing the 8051 Microcontroller MykePredko, TMH.
2. Microprocessors and Interfacing Programming and hardware Douglas V.Hall –Second Edition Tata McGraw- Hill Publishing company Ltd., New Delhi.
 - <https://www.tutorialspoint.com/microprocessor/index.htm>

Outcomes:

CO1: Would have learnt the architecture of 8086.

CO2: Would have learnt PIC Microcontrollers

CO3: Would have learnt to program Microcontrollers.

CO4: Would have learnt the concepts of 80286.

CO5: Would have learnt the implementation of PIO 8255

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

COs \ POs	PO1	PO2	PO3	PO4	PO5
	CO1	S	M	M	L
CO2	S	S	L	L	M
CO3	M	S	L	M	M
CO4	S	M	M	L	L
CO5	M	S	M	L	M

S: Strong; **M:** Medium; **L:** Low;

ARTIFICIAL INTELLIGENCE

Objective: On Successful completion of the course the students should have: understood the AI & Expert Systems.- Learnt the Heuristic techniques and reasoning

UNIT I

Introduction: AI Problems - AI techniques - Criteria for success. Problems, Problem Spaces, Search: State space search - Production Systems

UNIT II

Heuristic Search techniques: Generate and Test - Hill Climbing- Best-First - Means-end analysis. Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

UNIT III

Using Predicate logic: Representing simple facts in logic - Representing Instance and Is a relationships - Computable functions and predicates - Resolution.

UNIT IV

Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming - Forward Vs Backward reasoning - Matching - Control knowledge.

UNIT V

Game playing – The minimax search procedure – Expert System - Perception and Action

TEXT BOOKS

1. Elaine Rich and Kevin Knight," Artificial Intelligence", Tata McGraw Hill Publishers company Pvt Ltd, Second Edition, 1991.

Unit1: Chapter 1(1.1,1.3.1.5), Chapter 2(2.1,2.2);

Unit2: Chapter 3(3.1,3.2,3.3,3.6), Chapter 4(4.1,4.2,4.3,4.4).

Unit3: Chapter 5(5.1,5.2,5.3,5.4).

Unit4: Chapter 6.

Unit5: Chapter 12(12.1,12.2),Chapter 20 and Chapter 21.

- https://www.tutorialspoint.com/artificial_intelligence/index.htm

Outcomes:

CO1: Would have learnt AI Techniques

CO2: Would have learnt Heuristic Search Techniques

CO3: Would have learnt Predicate Logic

CO4: Would have learnt to implement representing knowledge using rules.

CO5: Would have learnt to implement game playing methodologies.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit	11a (or) 11b – 1 Unit	16 – I Unit
3,4 – II Unit	12a (or) 12b – II Unit	17 – II Unit
5,6 – III Unit	13a (or) 13b – III Unit	18 – III Unit
7,8 – IV Unit	14a (or) 14b – IV Unit	19 – IV Unit
9,10 – V Unit	15a (or) 15b – V Unit	20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	L	M	M
CO2	M	L	S	M	L
CO3	S	M	L	S	L
CO4	M	L	L	L	S
CO5	S	M	S	L	L

S: Strong; M: Medium; L: Low;

Extra Disciplinary Course -I

GENERAL STUDIES FOR COMPETITIVE EXAMINATIONS

UNIT-I

Teaching Aptitude: Teaching : Nature, objectives, characteristics and basic requirements; Learner's characteristics; Factors affecting teaching; Methods of teaching; Teaching aids; Evaluation systems.

Research Aptitude: Research : Meaning, characteristics and types; Steps of research; Methods of research; Research Ethics; Paper, article, workshop, seminar, conference and symposium; Thesis writing: its characteristics and format.

UNIT-II

Reading Comprehension: A passage to be set with questions to be answered.

Communication: Communication: Nature, characteristics, types, barriers and effective classroom communication.

UNIT-III

Reasoning (Including Mathematical) Number series; letter series; codes; Relationships; classification

Logical Reasoning: Understanding the structure of arguments; Evaluating and distinguishing deductive and inductive reasoning; Verbal analogies : Word analogy - Applied analogy; Verbal classification. Reasoning Logical Diagrams : Simple diagrammatic relationship, multidigrammatic relationship; Venn diagram; Analytical Reasoning.

UNIT-IV

Data Interpretation: Sources, acquisition and interpretation of data - Quantitative and qualitative data; - Graphical representation and mapping of data.

Information and Communicating Technology (ICT): ICT : meaning, advantages, disadvantages and uses; General abbreviations and terminology; Basics of internet and e-mailing.

UNIT-V

People and Environment: People and environment interaction; Sources of pollution; Pollutants and their impact on human life, exploitation of natural and energy resources; Natural hazards and mitigation

Higher Education System : Governance Polity And Administration; Structure of the institutions for higher learning and research in India; formal and distance education; professional/technical and general education; value education: governance, polity and administration; concept, institutions and their interactions.

REFERENCE

<http://www.cbsenetonline.in/>

<https://ugcnetpaper1.com/ugc-net-study-materials/>

CLOUD COMPUTING**Objective:**

- To impart knowledge on Introduction to Cloud Computing,
- The Evolution of SaaS,
- The Anatomy of Cloud Infrastructure,
- Workflow Management Systems and Clouds.

Unit I : Introduction to Cloud Computing: Roots of Cloud Computing - Layers and Types of Cloud - Features of a cloud-Infrastructure Management-Infrastructure as a Service Providers-Platform as a Service Providers-Challenges and Risks. Broad Approaches to Migrating into the Cloud - Seven Step Model of Migration into a Cloud. .

Unit II :The Evolution of SaaS-The Challenges of SaaS Paradigm- Approaching the SaaS Integration Enigma- New Integration Scenarios- The Integration Methodologies- SaaS Integration Products, Platforms and Services-B2Bi Services - . Background of Enterprise cloud computing paradigm- Issues for Enterprise Applications on the Cloud- Transition Challenges-

Unit III : The Anatomy of Cloud Infrastructure- Distributed Management of Virtual Infrastructures- Scheduling Techniques for Advance Reservation of Capacity- RVWS Design - Cluster as a Service: The Logical Design - Cloud Storage : from LANs TO WANs- Technologies for Data Security in Cloud Computing .

Unit IV :Workflow Management Systems and Clouds - Architecture of Workflow Management Systems - Utilizing Clouds for Workflow Execution- A Classification of Scientific Applications and Services in the Cloud- SAGA based Scientific Applications that Utilize Clouds. MapReduce Programming Model- Major MapReduce Implementations for the Cloud- MapReduce Impacts and Research Directions

Unit V :Grid and Cloud- HPC in the Cloud: Performance related Issues -Data Security in the Cloud- The Current State of Data Security in the Cloud- Homo Sapiens and Digital Information- Risk- Identity- The Cloud, Digital Identity and Data Security - Content Level Security :Pros and Cons- Legal Issues in Cloud Computing - Data Privacy and Security Issues-

Text Book(s):

Cloud Computing - Principles and Paradigms, by RajkumarBuyya, James Broberg, and AndrzejGoscinski. 2011 .

UNIT I: Chapter 1, 2.

UNIT II: Chapter 3,4.

UNIT III: Chapter 5,6.

UNIT IV: Chapter 12,13

UNIT V: Chapter 17,23.

REFERENCES:

Cloud Application Architectures,GeorgeReese,ISBN: 84047142,Shroff/O'Reilly,2009.

- <https://www.guru99.com/cloud-computing-for-beginners.html>

Outcomes:

- CO1:** Would have learnt SaaS
- CO2:** Would have learnt the anatomy of Cloud Infrastructure
- CO3:** Would have learnt Workflow management
- CO4:** Would have learnt the concepts of Grid computing
- CO5:** Would have learnt the concepts of Cloud computing

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	L
CO2	S	S	S	S	L
CO3	S	M	M	S	L
CO4	S	L	M	M	M
CO5	S	M	L	M	M

S: Strong; **M:** Medium; **L:** Low;

CORE COURSE –IX

ADVANCED NETWORK SECURITY**OBJECTIVES**

- To Recall the Understanding of ISO/OSI Model
- To Understand the need for Security
- To Learn the techniques of Cryptography

UNIT I

Overview: The OSI Security architecture – Security Attacks, Services and Mechanisms- A model for network security - Classical Encryption Techniques: Symmetric Cipher model- Substitution Techniques – Transposition Techniques - Block Cipher and DES: Block Cipher Principles - The Data Encryption Standard (DES) – The Strength of DES.

UNIT II

Advanced Encryption Standard: Finite Field Arithmetic - AES Structure - Block Ciphers Operation: Multiple Encryption and triple DES – Electronic Code Book – Ciphers Block Chaining Mode- Cipher Feedback Mode – Output Feedback Mode – Counter Mode. Pseudorandom Number Generation and Stream Ciphers: Principles of Pseudorandom number generation – Pseudorandom number generation – stream ciphers- RC4.

UNIT III

Public-Key Cryptography and RSA: Principles of Public- Key Cryptosystems – RSA algorithm. Other Public - Key Cryptosystems: Diffie - Hellman Key Exchange – Elliptic curve Arithmetic – Elliptic curve Cryptography. Message Authentication Code: Message Authentication Requirements – Message Authentication Functions- Requirements for Message Authentication codes- Security of MACs.

UNIT IV

Electronic Mail Security: Pretty Good Privacy – S/MIME.IP Security: IP Security Overview – IP Security Policy – Encapsulating Security Payload – Combining Security Associations - Internet Key Exchange – Cryptographic Suites.

UNIT V

Intruders: Intruders – Intrusion detection – Password Management. Malicious Software: Viruses – Virus Counter Measures. Firewall: The need for Firewalls- Firewall Design Principles- Trusted Systems.

TEXT BOOK

“Cryptography and Network Security”, William Stallings, Fifth Edition, Pearson Education, 2006

UNIT I: Chapter 1.2-1.6, 2.1-2.3, 3.1-3.4.; UNIT II: Chapter 5.1, 5.2, 6.1-6.6, 7.1, 7.2, 7.4, 7.5.

UNIT III: Chapter 9.1, 9.2, 10.1, 10.3, 10.4.; UNIT IV: Chapter 18.1, 18.2, 19.1, 19.2, 19.3, 19.4, 19.5, 19.6.

UNIT V: Chapter 20.1-20.3, 21.2, 21.3, 22.1-22.3.

REFERENCE BOOKS

1. “Introduction to Cryptography”, Johannes A. Buchaman, Springer – Verlag.
2. “Cryptography and Network Security”, AtulKahate, TMH.
 - <https://www.studytonight.com/computer-networks/>

Outcomes:

- CO1:** Would have learnt the techniques of DES [Data Encryption Standards]
CO2: Would have learnt the techniques of AES [Advanced Encryption Standards]
CO3: Would have learnt the techniques of IDS [Intrusion Detection System]
CO4: Would have learnt to implement the public key infrastructure
CO5: Would have learnt the concept of email security.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit	11a (or) 11b – 1 Unit	16 – I Unit
3,4 – II Unit	12a (or) 12b – II Unit	17 – II Unit
5,6 – III Unit	13a (or) 13b – III Unit	18 – III Unit
7,8 – IV Unit	14a (or) 14b – IV Unit	19 – IV Unit
9,10 – V Unit	15a (or) 15b – V Unit	20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	M
CO2	S	S	M	M	L
CO3	S	M	L	M	L
CO4	S	L	M	L	M
CO5	S	M	L	M	L

S: Strong; **M:** Medium; **L:** Low;

PROGRAMMING IN ASP.NET**OBJECTIVES**

- To Learn the basics of DOTNET Framework
- To Learn to Program in Web Forms
- To Learn to Program in ASP.Net
- To Learn to Use ADO.Net

UNIT I

.Net Framework - Learning the Common Language Runtime - .Net Class Library - .net Languages- ASP.Net File Type – Data Types, Objects & Namespaces – Code Behind.

UNIT II

Web Form Fundamentals- Server Controls – HTML Control Classes - Web Controls – Web Control Classes – Auto Post Back and Web Control Events.

UNIT III

Validation and Rich Controls – The Calendar Control – Ad Rotator Validation Controls – Validated Customer Form.

UNIT IV

Characteristics of ADO.Net – ADO.Net Data Objects Model – SQL Bases – Creating a Connection- Accessing Disconnected Data – Modifying Disconnected Data- Updating Disconnected Data - OLEDB Connectivity: Data Insertion – Data Deletion – Data Modification and Data Deletion.

UNIT V

Data Binding – Introducing Data Binding - Single value Data Binding – Repeated Value Data Binding – Data Binding with Databases – Data List - Data Grid Repeater

TEXT BOOK

“THE COMPLETE REFERENCE ASP.NET”, Steven Holzner, McGraw Hill Education (India) Edition 2008

UNIT I: Chapter 1 – 3, 5

UNIT II: Chapter 6, 7

UNIT III: Chapter 9

UNIT IV: Chapter 12, 13

UNIT V: Chapter 14, 15

REFERENCE BOOKS

1. Programming and Customizing the 8051 Microcontroller MykePredko, TMH.
2. Microprocessors and Interfacing Programming and hardware Douglas V.Hall –Second Edition Tata McGraw- Hill Publishing company Ltd., New Delhi.
 - [HTTPS://WWW.W3SCHOOLS.COM/ASP/](https://www.w3schools.com/asp/)

Outcomes:

- CO1:** Would have learnt programming Web Forms
CO2: Would have learnt Programming ADO.Net
CO3: Would have learnt Programming Data Binding

CO4: Would have learnt web form fundamentals

CO5: Would have learnt of validation of rich controls.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	L	L
CO2	S	M	L	L	L
CO3	M	M	L	M	L
CO4	S	M	M	S	L
CO5	M	L	L	M	L

S: Strong; **M:** Medium; **L:** Low;

PROGRAMMING IN ASP.NET LAB

1. HTML Control Classes
2. Web Controls
3. Validation Controls
4. Rich Controls
5. Database Handling using SQL Client
6. Database Handling using OLEDB Client
7. Data Binding with Databases
8. Data List

UNIFIED MODELING LANGUAGE**Objectives:**

- To learn the concepts of object oriented concepts
- To learn the symbols of OO Concepts
- To learn the various methodologies of Object orientation
- To learn to draw the diagrams of OO.

Unit I

Introduction: The Importance of Modeling - Principles of Modeling - Object-Oriented Modeling - Overview of UML - Conceptual Model of UML - Architecture - Software Development Life Cycle - Key Abstractions - Mechanisms - Components.

Unit II

Basic Structural Modeling: Classes - Relationships - Common Mechanisms - Diagrams - Class Diagrams

Unit III

Advanced Structural Modeling: Advanced Classes - Advanced Relationships - Interfaces, Types and Roles - Packages - Instances - Object Diagrams

Unit IV

Basic Behavioral Modeling: Interactions - Use Cases - Use Case Diagrams

Unit V

Interaction Diagrams - Activity Diagrams - Statechart Diagrams - Component Diagrams.

Text Book:

The Unified Modeling Language User Guide – Grady Booch, James Rumbaugh and Ivar Jacobson – Addison-Wesley.

UNIT I: Chapter 1 – 3 ; UNIT II: Chapter 4 – 8; UNIT III: Chapter 9 – 14
UNIT IV: Chapter 15 – 17 ; UNIT V: Chapter 18, 19, 24, 29

Reference Books:

1. Object Oriented Systems Development – Ali Bahrami – Tata McGraw Hill
2. UML Distilled – Martin Fowler – Prentice Hall of India / Pearson Education

- <https://www.tutorialspoint.com/uml/index.htm>

Outcomes:

- CO1:** Would have learnt the Basics of Structural Modeling
CO2: Would have learnt Advanced Structural Modeling
CO3: Would have learnt the Basics of Behavioural Modeling
CO4: Would have learnt to draw interaction diagrams to a given domain
CO5: Would have learnt to draw activity diagrams to a given domain.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – 1 Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – 1 Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	M
CO2	S	L	M	M	L
CO3	M	S	M	S	L
CO4	M	S	M	M	S
CO5	S	M	S	L	S

S: Strong; **M:** Medium; **L:** Low;

COMPUTER SIMULATION AND MODELING

Objective : To impart knowledge in real time modeling process and the simulation of any system using the real time mode

Unit I : Introduction to Simulation: When Simulation is the Appropriate Tool- When Simulation is not Appropriate- Advantages and Disadvantages of Simulation- Areas of Application- Systems and System Environment- Components of a System Discrete and Continuous Systems- Model of a System- Types of Models- Discrete Event System Simulation –Steps in a simulation study. Simulation Examples: Simulation of Queuing Systems, Simulation of Inventory Systems.

Unit II : Simulation Software: History of Simulation Software- Selection of Simulation Software- Simulation in JAVA, Simulation in GPSS, Simulation in SSF- Simulation software – Experimentation and Statistical and analysis tools .

Unit III : Statistical Models in Simulation: Review of Terminology and Concepts- Useful Statistical Models- Discrete Distributions- Continuous Distributions- Poisson process. Queuing models- Characteristics of queuing systems.

Unit IV : Random-Number Generation: Properties of Random Numbers-Generation of Pseudo- Random Numbers- Techniques for Generating Random Numbers-Linear congruential Method- Random number streams -Tests for random numbers Frequency tests - Test for Autocorrelation. Random-Variate Generation: Inverse Transform Technique-Exponential Distribution-Uniform Distribution- Weibull Distribution.

Unit V : Input Modeling: Data Collection - Identifying the Distribution with Data- parameter estimation- goodness of fit tests. Verification and Validation of Simulation Models: Model Building, Verification, and Validation-Verification of Simulation Models Calibration and Validation of Models.

Text Book: 1. Jerry Banks, John S. Carson, II Barry L. Nelson., Discrete-Event System Simulation, Fourth Edition, PHI Edition, 2009.

Unit:I :Chapter 1 Sections (1.1-1.11), Chapter 2 Sections (2.1, 2.2)

Unit:II :Chapter 4 Sections (4.1, 4.2, 4.4-4.7)

Unit:III :Chapter 5 Sections (5.1-5.5), Chapter 6 Sections (6.1)

Unit:IV :Chapter 7 Sections (7.1, 7.2, 7.3.1, 7.3.3, 7.4), Chapter 8 Sections (8.1.1-8.1.3)

Unit:V :Chapter 9 Sections (9.1-9.4), Chapter 10 Sections (10.1-10.3)

Book for Reference: E.Winsberg, Science in the age of computer simulation, Chicago: University Press, 2010.

- <https://faculty.londondeanery.ac.uk/e-learning/using-simulation-in-clinical-education/simulation-and-learning>

Outcomes:

CO1: Would have learnt about simulation software

CO2: Would have learnt about Random Number Generation

CO3: Would have learnt about Input Modeling.

CO4: Would have learnt to implement statistical methods

CO5: Would have learnt about frequency tests.

Part – A	Part – B	Part – C
Answer all the Questions 10 X 2 = 20 Marks	Internal Choice Type 5 X 5 = 25 Marks	Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit	11a (or) 11b – 1 Unit	16 – I Unit
3,4 – II Unit	12a (or) 12b – II Unit	17 – II Unit
5,6 – III Unit	13a (or) 13b – III Unit	18 – III Unit
7,8 – IV Unit	14a (or) 14b – IV Unit	19 – IV Unit

9,10 – V Unit	15a (or) 15b – V Unit	20 – V Unit
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Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	L	S	M
CO2	S	M	L	L	M
CO3	M	L	M	M	L
CO4	S	S	M	M	S
CO5	M	M	M	L	S

S: Strong; **M:** Medium; **L:** Low;

CORE COURSE –XII

WEB SERVICES

- To understand the Basics of Web Services
- To Learn SOAP with XML
- To Learn WSDL
- To Learn UDDI

UNIT I

Introduction: What are Web Services? SOAP WSDL UDDI – Why was a service are important? – The evolution of web applications Not Just another distributed Computing platform – Web Services and enterprises. XML Fundamentals: The Lingua Franca of Web Services – XML Documents – XML namespaces Explicit and Default namespaces, inheriting namespaces, and not inheriting namespaces, Attributes and namespaces

UNIT II

XML Schema XML Schema and namespaces, A First Schema, Implementing XML Schema types, The any Element, Inheritance, Substitution groups, Global and local type declarations, Managing Schemas, Schemas and instance documents, XML Schema best practices. SOAP: SOAP Messages – SOAP Encoding – RPC

UNIT III

WSDL: WSDL – Using SOAP WSDL - UDDT at glance – The UDDI Business registry – UDDI under the covers – Accessing UDDI – How UDDI is playing out

UNIT IV

Conversations: Overview – Web Services Conversation Language – WSCL Interface components – The Bar Scenario Conversations – Relationship between WSCL and WSDL

UNIT V

Workflow – Business Process Management – Workflows and Workflow Management Systems-Business Process Execution Language for Web Services

TEXT BOOK

Sandeep Chatterjee, James webber, “Developing Enterprise web services”. Pearson Education, 2004

UNIT I: Chapter 1, 2;

UNIT II: Chapter 2, 3;

UNIT III: Chapter 3, 4

UNIT IV: Chapter 5;

UNIT V: Chapter 6

REFERENCE BOOK

Frank, P.Coyle, XML, Web Services and the Date Revolution, Pearson Education, 2002.

- <https://www.tutorialspoint.com/webservices/index.htm>

Outcomes:

CO1: Would have learnt about the basic building blocks of web services

CO2: Would have learnt about SOAP, WSDL AND WSCL

CO3: Would have learnt about Business Process Management.

CO4: Would have learnt about the implementation of XML technologies

CO5: Would have learnt about Workflow management systems.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

POs COs	PO1	PO2	PO3	PO4	PO5
CO1	M	L	L	S	S
CO2	S	M	M	L	L
CO3	M	L	L	M	L
CO4	M	L	M	L	S
CO5	S	M	L	M	L

S: Strong; **M:** Medium; **L:** Low;

CORE COURSE –XIII

SOFTWARE PROJECT MANAGEMENT

- To Understand the Concepts of Project Management
- To Understand the Planning aspects of a Software Project
- To Understand Software Cost Estimation

UNIT I :Introduction to software management: Introduction- why is SPM important? –Project- Software project Vs other type of project – Contract and technical project management – Activities- plan, methods And methodologies – categorizing software projects – stakeholders – Setting objectives – project success and failures – Managements.

UNIT II :Project Evaluation and Programme Management: Introduction-Business case- Project portfolio management- Evaluation of individual Projects-Cost benefit Evaluation Techniques - Risk Evaluation - Programme Management – managing the allocation of resources – Strategic programme management – Creating a programme and aids –Benefits management.

UNIT III :Overview of Project Planning: Introduction- Stepwise Project Planning- steps. Selection of An Appropriate Project Approach: Introduction-Build or buy- Choosing methodologies and technologies-- software Processes and models-choice of Process models- Structure Vs speed of delivery – Waterfall model - spiral model – software prototyping - Rapid application development – Agile methods- Extreme programming.

UNIT IV :Software Effort Estimation: Introduction-Where are estimates done? – Problems with over and under estimates – Basis for estimating and its Techniques – Bottom up estimating-Top down approach and parametric models- Expert judgment-Estimating by analogy Function point analysis-FP markII-COSMIC full FP-COCOMO II- cost estimation and staffing patterns.

UNIT V : Activity Planning: Introduction-objectives-when to plan?-project schedules-Projects activities-network Planning models-sequencing and scheduling activities-Formulating a network model-Adding the time dimension- Forward and backward Pass- critical Path-activity Float- Shortening the project duration-critical activities- Activity on arrow network.

Risk management: Introduction-Risk-Categories of Risk-a framework for dealing with risk-Risk identification-Risk assessment

TEXT BOOK

“Software Project Management” – Bob Hughes, Mike Cotterell and Rajib Mall- Fifth Edition

UNIT I: Chapter 1

UNIT II: Chapter , 2

UNIT V: Chapter 5,6

UNIT III: Chapter 3

UNIT IV: Chapter 4

REFERENCE BOOK

Software Project Management –Walker Royce-Pearson Education

- <http://brodzinski.com/2010/06/learning-project-management-basics.html>

Outcomes:

- CO1:** Would have learnt about Software Project Planning
CO2: Would have learnt about Software Cost Estimation
CO3: Would have learnt about Software Activity Planning.
CO4: Would have learnt to implement risk management.
CO5: Would have learnt about project approach.

Part – A Answer all the Questions 10 X 2 = 20 Marks	Part – B Internal Choice Type 5 X 5 = 25 Marks	Part – C Answer any 3 Questions 3 X 10 = 30 Marks
Question 1,2 – I Unit 3,4 – II Unit 5,6 – III Unit 7,8 – IV Unit 9,10 – V Unit	11a (or) 11b – I Unit 12a (or) 12b – II Unit 13a (or) 13b – III Unit 14a (or) 14b – IV Unit 15a (or) 15b – V Unit	16 – I Unit 17 – II Unit 18 – III Unit 19 – IV Unit 20 – V Unit

Mapping Course Outcomes with Programme Outcomes:

COs \ POs	PO1	PO2	PO3	PO4	PO5
	CO1	M	L	L	S
CO2	S	L	L	M	M
CO3	S	M	L	M	L
CO4	S	M	M	L	S
CO5	L	M	L	M	L

S: Strong; **M:** Medium; **L:** Low;

Course Code	18PCS14	PROJECT WORK	TOTAL HOURS	CREDITS
			12	5
Core/Elective/Supportive		Core Course - XIV	Syllabus Version	2018-2019
Course Objectives:				
<ol style="list-style-type: none"> 1. To Conduct an engineering project. 2. To Communicate with engineers and the community at large in written an oral forms. 3. Effectively organise time to deliver on the dissertation's aims within the limited time available 4. Effectively manage tasks and solve problems 				
Expected Course Outcomes:				
On the successful completion of the course, student will be able to:				
CO1: Demonstrate a sound technical knowledge of their selected project topic.				
CO2: Undertake problem identification, formulation and solution.				
CO3: Design engineering solutions to complex problems utilising a systems approach.				
CO4: Demonstrate the knowledge, skills and attitudes of a professional engineer.				
CO5: Able to build a small application from the above study.				
Online Web Reference				
1	https://sourceforge.net			

Max Marks : 100

IE : 25

EX : 75

Credit : 5