

Annexures: I& II

BHARATHIAR UNIVERSITY, COIMBATORE-641 046
MASTER OF COMPUTER APPLICATIONS (MCA) – (CBCS) - University Dept.
(Effective from the academic Year 2018-2019)

1. Eligibility for Admission to the Courses

MCA:A pass in any recognized Bachelors degree of minimum 3 years duration (10 + 2 + 3/4 years pattern) in any discipline with core Mathematics (or) Business Mathematics at Higher Secondary Level or A pass in any recognized Bachelors degree with 10 + 3 years diploma +3 years pattern with Mathematics at Diploma level or Mathematics or Statistics as one of the subjects at the degree level or A pass in any recognized Bachelors degree of minimum 3 years duration (10 + 2 + 3 years pattern) in any discipline with Mathematics or Statistics as any one of the subjects. Candidates should have appeared for TANCET/ Bharathiar University MCA Entrance Test.

MCA (Lateral Entry): A pass in Bachelors degree of minimum 3 years duration in BCA,B.Sc. (Computer Science/ Computer Technology/ Information Technology/ Computer System and Design) or equivalent with Mathematics as a course at Higher Secondary level or at Graduate level. The candidate should have appeared for TANCET/ Bharathiar University MCA Entrance Test.

2. Duration of the Courses

These programmes shall be offered on a full-time basis. The MCA programme will consist of five semesters of course work and laboratory work and the sixth semester consists of project. The MCA (Lateral Entry) programme will consist of three semesters of course work and laboratory work and the final semester consists of project. The students admitted in MCA (Lateral Entry) shall follow the third to sixth semester syllabus of MCA programme.

3. Regulations

The general Regulations of the Bharathiar University Choice Based Credit System Programme are applicable to these programmes.

4. The Medium of Instruction and Examinations

The medium of instruction and Examinations shall be in English.

5.Submission of Record Notebooks for Practical Examinations & Project Viva-Voce.

Candidates taking the Practical Examinations should submit bonafide Record Note Books prescribed for the Examinations. Otherwise the candidates will not be permitted to take the Practical Examinations. Candidates taking the Project Viva Examination should submit Project Report prescribed for the Examinations. Otherwise the candidates will not be permitted to take the Project Viva-voce Examination.

Students carry out Mini-project during the V semester summer vacation. First review for the mini-project will be held on Thursday of first week in June. Second review for the mini-project will be held on Thursday of first week in August.

First review for Major project will be on Friday of first week of February. Second review for Major project will be on Friday of first week of April.

6.Ranking

A candidate who qualifies for the PG Degree Course passing all the Examinations in the first attempt, within the minimum period prescribed for the Course of Study from the date of admission to the Course and secures 1st or 2nd Class shall be eligible for ranking and such ranking will be confined to 10% of the total number of candidates qualified in that particular subject to a maximum of 10 ranks. Ranking will be done for MCA 3 year programme students and MCA Lateral Entry programme students put together.

7. Revision of Regulations and Curriculum

The above Regulation and Scheme of Examinations will be in vogue without any change for a minimum period of three years from the date of approval of the Regulations. The University may revise /amend/ change the Regulations and Scheme of Examinations, if found necessary.

8. Equivalence

MCA (Lateral Entry) programme is equivalent to MCA programme.

MASTEROFCOMPUTER APPLICATIONS (MCA) Univ. Dept.
*(MCA- Effective from the academic Year2018-2019 and
for those admitted during 2017-2018)*
(MCA Lateral Entry- Effective fromtheacademicYear2018-2019)
Scheme of Examinations

Core/Elective /Supportive/ Project	Suggested Code	Sem	Title of the Paper	L	P	Credits	Marks
Core	18CSEAC01	I	C Programming & Data Structures	2	2	4	100
Core	18CSEAC02	I	Computer Organization & Architecture	4	0	4	100
Core	18CSEAC03	I	Operating Systems	2	2	4	100
Core	18CSEAC04	I	Mathematics for Computing	4	0	4	100
Core	18CSEAC05	I	Design and Analysis of Algorithms & Object-Oriented Programming	2	2	4	100
Core	18CSEAC06	I	Word Processing #			2	50
Core	18CSEAC07	II	Management Information Systems	2	2	4	100
Core	18CSEAC08	II	Operations Research	4	0	4	100
Core	18CSEAC09	II	Relational Database Management System	2	2	4	100
Core	18CSEAC10	II	Software Engineering	4	0	4	100
Core	18CSEAE11	II	Data Visualisation	2	2	4	100
Online Course	18CSEAOXX	II	Online Courses*			2	50
Core	18CSEAC12	III	Advanced Java Programming	2	2	4	100
Core	18CSEAC13	III	Computer Networks	2	2	4	100
Core	18CSEAC14	III	Software Project Management	4	0	4	100
Core	18CSEAC15	III	Computer Security and Cryptography	4	0	4	100
Core	18CSEAC16	III	Soft Skills–I	3	1	4	100
Core	18CSEAC17	III	Data Analysis and Presentation Tools#			2	50
Supportive	18CSEGSXX	III	General Supportive		2	2	50
Core	18CSEAC18	IV	Open Source Programming	3	1	4	100
Core	18CSEAC19	IV	Mobile Programming	2	2	4	100
Core	18CSEAC20	IV	Computer Graphics and Multimedia	2	2	4	100
Elective	18CSEAEXX	IV	Elective– I			4	100
Elective	18CSEAEXX	IV	Elective –II			4	100
Online Course	18CSEAOXX	IV	Online Courses*			2	50
Supportive	18CSEGSXX	IV	General Supportive			2	50
Core	18CSEAC21	V	Internet Programming and Web Designing	2	2	4	100
Core	18CSEAC22	V	Data Mining	2	2	4	100
Core	18CSEAC23	V	Soft Skills–II	3	1	4	100
Core	18CSEAC24	V	Internet and HTML Programming#			2	50
Elective	18CSEAEXX	V	Elective –III			4	100
Elective	18CSEAEXX	V	Elective –IV			4	100
Supportive	18CSEGSXX	V	General Supportive			2	50

Mini-Project	18CSEAC25	V	Mini Project and Viva Voce			6	150
Project	18CSEAC26	VI	Project Work and Viva Voce			17	425
			Total			135	3375

*** Online courses - This can be availed by the students at anytime during that particular year of study. Two weeks of online course is considered as one credit course and four weeks of online course is considered as two credits course. Students are expected to produce certificates from Swayam/NPTEL/Spoken Tutorial of IIT Mumbai/Coursera.**

Self Learning Courses

Electives for MCA (CBCS)

Elective	Suggested Code	Title of the Paper	L	P
Networking and Distributed Systems				
Elective	18CSEAE01	Internet of Things and Wireless Sensor Networks	2	2
Elective	18CSEAE02	Mobile Networking	4	0
Elective	18CSEAE03	Grid and Cloud Computing	4	0
Database Technologies				
Elective	18CSEAE04	Data Analysis and Business Intelligence	4	0
Elective	18CSEAE05	BigData Technologies	4	0
Elective	18CSEAE06	NoSQLI– MongoDB	2	2
Elective	18CSEAE07	NoSQLII– Neo 4j	2	2
Intelligent Systems				
Elective	18CSEAE08	Image Processing	2	2
Elective	18CSEAE09	Soft Computing	4	0
Elective	18CSEAE10	Intelligent Agents	4	0
Elective	18CSEAE11	Machine Learning	4	0
Elective	18CSEAE12	Embedded Systems	2	2
Web Technologies				
Elective	18CSEAE13	Semantic Web	4	0
Elective	18CSEAE14	Service Oriented Architecture and Web Services	4	0
Elective	18CSEAE15	Social Networking and Web Mining	4	0
Elective	18CSEAE16	Progressive Web Application Development	2	2
Advanced Programming				
Elective	18CSEAE17	Python Programming	2	2
Elective	18CSEAE18	.NET Programming	2	2
Elective	18CSEAE19	Graphical Programming and Virtual Instrumentation	2	2

BHARATHIARUNIVERSITY::COIMBATORE - 641 046.

MASTER OF COMPUTER APPLICATIONS (MCA) Univ. Dept.

(MCA- Effective from the academic Year2018-2019)

(MCA Lateral Entry- Effective from theacademicYear2018-2019)

Scheme of Examinations

Core	18CSEAC12	III	Advanced Java Programming	2	2	4	100
Core	18CSEAC13	III	Computer Networks	2	2	4	100
Core	18CSEAC14	III	Software Project Management	4	0	4	100
Core	18CSEAC15	III	Computer Security and Cryptography	4	0	4	100
Core	18CSEAC16	III	Soft Skills–I	3	1	4	100
Core	18CSEAC17	III	Data Analysis and Presentation Tools #			2	50
Supportive	18CSEGSXX	III	General Supportive		2	2	50
Core	18CSEAC18	IV	Open Source Programming	3	1	4	100
Core	18CSEAC19	IV	Mobile Programming	2	2	4	100
Core	18CSEAC20	IV	Computer Graphics and Multimedia	2	2	4	100
Elective	18CSEAEXX	IV	Elective– I			4	100
Elective	18CSEAEXX	IV	Elective –II			4	100
Online Course	18CSEAOXX	IV	Online Courses*			2	50
Supportive	18CSEGSXX	IV	General Supportive			2	50
Core	18CSEAC21	V	Internet Programming and Web Designing	2	2	4	100
Core	18CSEAC22	V	Data Mining	2	2	4	100
Core	18CSEAC23	V	Soft Skills–II	3	1	4	100
Core	18CSEAC24	V	Internet and HTML Programming #			2	50
Elective	18CSEAEXX	V	Elective –III			4	100
Elective	18CSEAEXX	V	Elective –IV			4	100
Supportive	18CSEGSXX	V	General Supportive			2	50
Mini-Project	18CSEAC25	V	Mini Project and Viva Voce			6	150
Project	18CSEAC26	VI	Project Work and Viva Voce			17	425

*** Online courses - This can be availed by the students at anytime during that particular year of study. Two weeks of online course is considered as one credit course and four weeks of online course is considered as two credits course. Students are expected to produce certificates from Swayam/NPTEL/Spoken Tutorial of IIT Mumbai/Coursera.**

Self Learning Courses

Electives for MCA (CBCS)

Elective	Suggested Code	Title of the Paper	L	P
Networking and Distributed Systems				
Elective	18CSEAE01	Internet of Things and Wireless Sensor Networks	4	0
Elective	18CSEAE02	Mobile Networking	4	0
Elective	18CSEAE03	Grid and Cloud Computing	4	0
Database Technologies				
Elective	18CSEAE04	Data Analysis and Business Intelligence	4	0
Elective	18CSEAE05	Big Data Technologies	4	0
Elective	18CSEAE06	No SQLI– MongoDB	2	2
Elective	18CSEAE07	No SQLII– Neo 4j	2	2
Intelligent Systems				
Elective	18CSEAE08	Image Processing	2	2
Elective	18CSEAE09	Soft Computing	4	0
Elective	18CSEAE10	Intelligent Agents	4	0
Elective	18CSEAE11	Machine Learning	4	0
Elective	18CSEAE12	Embedded Systems	2	2
Web Technologies				
Elective	18CSEAE13	Semantic Web	4	0
Elective	18CSEAE14	Service Oriented Architecture and Web Services	4	0
Elective	18CSEAE15	Social Networking and Web Mining	4	0
Elective	18CSEAE16	Progressive Web Application Development	2	2
Advanced Programming				
Elective	18CSEAE17	Python Programming	2	2
Elective	18CSEAE18	.NET Programming	2	2
Elective	18CSEAE19	Graphical Programming and Virtual Instrumentation	2	2

Department of Computer Applications
Bharathiar University
Computer Science and Engineering - Online Course

Master of Computer Applications & Master of Computer Applications (Lateral Entry):

1. National Programme on Technology Enhanced Learning - (NPTEL)

Course	Duration	Course Period	Website	Course Fee
Cloud Computing and Distributed Systems	08 Weeks	Aug 27 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs45/preview	Rs 1100
Introduction of Machine Learning	08 Weeks	Aug 27 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs40/preview	Rs 1100
Introduction to Programming in C	08 Weeks	Aug 27 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs33/preview	Rs 1100
Block chain Architecture Design and Use Cases	12 Weeks	July 30 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs47/preview	Rs 1100
Cloud Computing	08 Weeks	Aug 06 – Sep 28, 2018	https://onlinecourses.nptel.ac.in/noc18_cs44/preview	Rs 1100
Computer Architecture	12 Weeks	July 30 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs29/preview	Rs 1100
Database Management System	08 Weeks	Aug 06 – Sep 28, 2018	https://onlinecourses.nptel.ac.in/noc18_cs36/preview	Rs 1100
Introduction Of Internet of Things	12 Weeks	July 30 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs46/preview	Rs 1100
Scalable Data Science	08 Weeks	Aug 06 – Sep 28, 2018	https://onlinecourses.nptel.ac.in/noc18_cs39/preview	Rs 1100
Software Testing	12 Weeks	July 30 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs43/preview	Rs 1100
The Joy of Computing using Python	12 Weeks	July 30 – Oct 19, 2018	https://onlinecourses.nptel.ac.in/noc18_cs35/preview	Rs 1100
Programming, data structures and algorithm using python	08 Weeks	Aug 06 – Sep 28, 2018	https://onlinecourses.nptel.ac.in/noc18_cs34/preview	Rs 1100

2.SWAYAM – Online Education

Course	Duration	Course Period	Website	Course Fee
Cyber Law	94 Hrs	Sep 10 – Oct 31, 2018	https://swayam.gov.in/courses/public	Free
Information Security	108 Hrs	Sep 10 – Oct 29, 2018	https://swayam.gov.in/courses/public	Free
E-Governance	60 Hrs	Sep 04 – Dec 07, 2018	https://swayam.gov.in/courses/public	Free
Information Technology	15 Hrs	Oct 01 – Nov 24, 2018	https://swayam.gov.in/courses/public	Free
Cryptography	120 Hrs	Sep 04 – Oct 31, 2018	https://swayam.gov.in/courses/public	Free
Graphics and Animation Development	20 Hrs	Aug 30 – Oct 31, 2018	https://swayam.gov.in/courses/5216-graphics-and-animation-development	Free
E-content development	40 Hrs	Oct 28 – Dec 24, 2018	https://swayam.gov.in/courses/5212-e-content-development	Free

3. IBM – Online Courses

Course	Duration	Course Period	Website	Course Fee
Data Science	3 weeks 2-3 hours/week	-	https://cognitiveclass.ai/courses/data-science-101/	Free
Statistics 101	6 Hrs	-	https://cognitiveclass.ai/courses/statistics-101/	Free
Machine Learning with Python	12 Hrs	-	https://cognitiveclass.ai/courses/machine-learning-with-python/	Free

BHARATHIAR UNIVERSITY:: COIMBATORE-641046

**DEPARTMENT OF COMPUTER APPLICATIONS
MCA and MCA (Lateral Entry) Programme
OBE FORMAT**

On completion of MCA Programme, the students will be able to

PO1: Apply knowledge of mathematics, science and computing appropriately to model the software applications.

PO2: Assimilate and use state of the art computing technologies, tools and techniques necessary for computing practices.

PO3: Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social and ethical contexts

PO4: Have an ability to design, implement and evaluate sustainable computational solutions for various complex problems as per needs and specifications.

PO5: Communicate effectively with the computing community, and with society, about complex computing activities by being able to comprehend and write effective reports, design documentation, and make effective presentations.

PO6: Manage projects and function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO7: Recognize the need for and prepare themselves to engage in independent and life-long learning in the context of technological advancements.

PO8: Engage in self-learning for continual development as a computing professional for the betterment of individuals, organizations, research community and society.

PO9: Apply ethical principles and commit to professional responsibilities and human values.

PO10: Utilize the education necessary to understand the impact of computing solutions in a global and societal context

PO11: Innovate and contribute value and wealth for the benefit of the society.

Course Title : C Programming and Data Structures

No. of Credits:4

Course Code :18CSEAC01

No. of Teaching Hours: T-30, P-30

Course Objectives

To impart knowledge to make the students

1. To Understand the Programming in C language
2. To Understand the various Data structures for representation of structures and searching

UNIT I

An overview of C -data types and sizes -declarations -variables -constants -operators -hierarchy of operators -C expressions -precedence and order of evaluation -program control structure -the loop control structures. –Storage classes.

UNIT II

Arrays -strings –Functions –function prototypes -recursion -structures -array of structures – additional features of structures -difference between array and structures -structure in functions - self-referential structures -unions

UNIT III

Pointers –array of pointers –pointers to an array –pointer to pointers –pointers to functions – function returning pointers -pointers to structure -problems with pointers. Files –Sequential and random accessing -command line arguments -C preprocessor.

UNIT IV

Stacks & Recursion: Stacks-Introduction to Recursion-Principles of Recursion-Polish Notation-Evaluation of Polish Expression-Translation from Infix form to polish form. Queues: -Circular queues -Polynomial Arithmetic. Linked Lists: Single Linked List – Doubly Linked list.

UNIT V

Trees & Graphs: Binary Search Trees -AVL Trees -B-Trees. Graphs: Definitions-Undirected & Directed Graphs-Traversal-Topological Sorting-Shortest Paths. Tables: Tables of various shapes-Abstract Tables-Radix Sort-Hashing

REFERENCES

1. Yashvant P. Kanetkar, „ Let Us C“, BPB Publications, 2002.
3. E. Balagurusamy, 'Programming in ANSI C', Tata McGraw Hill, 2004
4. Byron C Gotfried, Programming with C, Schaums“ outline series, 2nd edition, Tata McGraw Hill, 2006.
5. S. Thamaraiselvi G. Murugesahan, „C for all“, Anuradha agencies.
6. Robert A. Radcliffe, 'Encyclopedia C' BPB Publications.
7. Brain W. Kernighan, Dennis M.R. Chie, 'The Programming Language' Prentice Hall, 1990.
8. Gottfried, B. 'Theory and Problems of Programming with C', McGraw Hill, 1990.

Course Outcomes

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

CO1	To describe the program control structure and the loop control structure	Understand
CO2	To demonstrate the difference between array and structures.	Analyse
CO3	To Summarize the concept of file management system	Understand
CO4	To develop C programs for arrays and links	Apply
CO5	To develop C programs using pointers	Apply

Course Prepared by : Dr. J. Satheeshkumar

Course Verified by : Dr. T. Devi

Course Title : Computer Organization and Architecture **No. of Credits:4**

Course Code :18CSEAC02 **No. of Teaching Hours: T-60, P-0**

Course Objectives

To impart knowledge to make the students

1. To understand data representation
2. To understand computer arithmetic, register and I/O organization

UNIT I

Data representation: Data types – Complements – Fixed – pointer presentation – Floating - point representation –Logic Gates-Combinational circuits- Flip-flops –Multiplexers–Decoders.

UNIT II

Registers – Shift registers – Binary counters – Register transfer – Bus and memory transfers – Arithmetic micro operations – Logic and shift micro operations-Arithmetic logic shift unit.

UNIT III

CPU: Register and stack organization – Instruction formats – Addressing modes – Data transfer and manipulation –Program control–RISC.

UNIT IV

Computer arithmetic: Addition, subtraction, multiplication and division of signed - magnitude data. Parallel processing: Pipelining–Arithmetic and instruction pipeline–RISC pipeline– Array Processors.

UNIT V

Input-output organization: Peripheral devices–I/O interface –Asynchronous data transfer. Memory organization: Memory hierarchy–Main memory–Auxiliary memory–Associative memory–Cache memory–Virtual memory.

REFERENCES

1. M. Morris Mano, “Computer System Architecture”, 3rd Edition, Pearson Education, 2007.
2. John P Hayes, “Computer Architecture and Organization”, 4th Edition, McGraw-Hill Book Company, 2012.
3. M Morris Mano, “Digital Logic and Computer Design”, 1st Edition, Pearson Education, 2016.
4. Malvino A. P., Donald P. Leach, GoutamSaha, “Digital Principles and Applications”, 8th Edition, McGraw Hill Publications, 2014.
5. William Stallings, “Computer Organization and Architecture”, Pearson Education, 10th edition, 2016.

Course Outcomes

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

CO1	To explain about computer architecture	Understand
CO2	To compute simple arithmetic operations for fixed-point and floating-point addition, subtraction, multiplication & division.	Apply
CO3	To design combinational and sequential digital functions	Understand
CO4	To construct an instruction set capable of performing a specified set of operations	Analyze
CO5	To demonstrate a full adder circuit for an addition operation	Analyze
CO6	To explain pipelining concepts	Understand
CO7	To compare the different ways of communicating with I/O devices and standard I/O interfaces.	Analyze

Course Prepared by : Mr. S. Palanisamy

Course Verified by : Dr. T. Devi

Course Title :Operating Systems

No. of Credits:4

Course Code :18CSEAC03

No. of Teaching Hours:T-30, P-30

Course Objectives

To impart knowledge to make the students

1. To understand the operating system principles.
2. To understand the Principles of Deadlock, processor scheduling and memory management.
3. To learn using case studies in different OS.

UNIT I

Introduction: Operating System, Types of Operating System. Process: Process Concept – Hierarchy of Process – Critical Section Problem – Semaphores – Inter Process Communication. CPU Scheduling. Deadlock: Deadlock Problem, Characterization, Prevention, Avoidance - Detection - Recovery.

UNIT II

Memory Management: Basics – Swapping – Virtual Memory – Page Replacement Algorithms – Segmentation. Input/output: Principles of I/O Hardware and Software – Discs – Clocks – Graphical User Interface. File Systems: Files – Directories – File System Implementation. Protection and Security Overview.

UNIT III

Linux System: Introduction – Programming Linux. Shell Programming: What is Shell? – Pipes and Redirection – The Shell as a Programming Language – Shell Syntax – The Dialog Utility. Working with Files: Linux File Structure – System Calls and Device Drivers – Library Functions – Low-Level File Access – The Standard i/o Library – Formatted Input Output – File and Directory Maintenance – Scanning Directories.

UNIT IV

The Linux Environment: Program Arguments – Environment Variable – time and Date – Temporary Files – User Information – Host Information – Logging – Resources and Limits. Terminals: Reading from and Writing to the Terminal – Talking to the Terminal – The Term iOS Structure – Terminal Output – Detecting Keystrokes.

UNIT V

The vi Editors: vi Text Editor – Simple Editing – Advance Editing. The vim Editor: Creating and Editing File with vim – Introduction to vim Features – Moving Cursor in Command Mode– Deleting and Changing Text in Command Mode – Input Mode – Searching and Substituting – Copying, Moving and Deleting Text - Reading and Writing Files – Advanced Editing Techniques.

REFERENCES

1. Andrew S. Tanenbaum, HebrertBos, “Modern Operating Systems”, 4th Edition, Pearson Publication, 2015.
2. Abraham Silberschatz, Peter Baer Galvin and Greg Gage, “Operating System Concepts”, 9th Edition, John Wiley and Sons Inc., 2012.
3. Richard Stones, Neil Matthew, “Beginning: Linux Programming” 4nd Edition, 2007.
4. Mark G. Sobell “A Practical Guide to Linux commands, Editors, and Shell Programming”, 2nd Edition, Pearson, 2011.
5. Arnold Robbins, Elbert Hannab and Linda Lamb, “Learning the vi and vim Editors” 7th Edition O’Reilly, 2008.

Course Outcomes

On successful completion of the course the students should have:

CO1	To describe the evolution types, structures and function of operating system	Understand
CO2	To explain techniques involved in process management and Scheduling	Apply
CO3	To explain IPC techniques, Memory Management in operating system	Apply
CO4	To describe File allocation methods, security and protection used in operating System	Analyze
CO5	To understand Linux Shell, File structure and Environment	Understand/ Apply
CO6	To apply usage of Linux editors and Linux shell commands, reading and writing files.	Apply

Course Prepared by : Dr. T. Devi

Course Verified by : Dr. T. Devi

Course Title : Mathematics for Computing

No. of Credits:4

Course Code :18CSEAC04

No. of Teaching Hours:T-60, P-0

Course Objectives

To impart knowledge to make the students

1. To understand the Probability Theory
2. To understand regression and theoretical distributions.

UNIT I

Basic probability theory - distributions and their properties - Frequency Distribution - Continuous or Grouped Frequency Distribution - Magnitude of Class intervals - Cumulative Frequency Distribution - Two Way Frequency Distribution - Measures of Central Tendency: Arithmetic Mean, Geometric Mean - Harmonic Mean - Median, Mode - Dispersion: Overview - Mean Deviation - Standard Deviation - Combined Standard Deviation.

UNIT II

Regression: Overview - Simple and multiple regression analysis - Regression, Graphical Method - Algebraic Method - Regression Line - Regression Equation, - hypothesis testing - Hypothesis - Standard Error - Test of Significance for Attributes - Test of Significance for Large Samples - Test of Significance for Small Samples - Chi Square Test - sampling - estimation theory - least square methods - SVD – transformations

UNIT III

Stochastic models compression techniques - Markov Models - Markov decision process - application in sequential decision making

UNIT IV

Theoretical Distribution: Binominal Distribution - Obtaining Coefficient - Poison Distribution - Normal Distribution - Poisson - Cumulative Poisson Process and its generalization - applications in different business domain - ARMA and ARIMA - Monte Carlo Simulations

UNIT V

Application of data analytics in different domains – Exploring Case Studies for the topics given in Unit I to Unit IV.

REFERENCES

1. R.S.N. Pillai, Bagavathi, “Statistics Theory and Practice, S.Chand& Company, 2013
2. Douglas C. Montgomery, George C. Runger., “Applied Statistics for Engineers”, John Wiley & Sons.Inc, 2003

Course Outcomes

On successful completion of the course the students should have:

CO1	To understand the principles of probability, frequency distribution measures	Understand
CO2	To understand the correlation and regression, hypothesis test, sampling techniques for specific applications	Apply
CO3	To apply probabilistic models and distribution models	Apply
CO4	To apply hypothesis testing and regression models for specific domain	Analyze
CO5	To illustrate statistical methods and Infer	Evaluate
CO6	To design statistical models for specific domains	Create

Course Prepared by : Dr. V. Bhuvaneshwari

Course Verified by : Dr. T. Devi

**Course Title : Design and Analysis of Algorithms &
Object Oriented Programming**

No. of Credits:4

Course Code :18CSEAC05

No. of Teaching Hours:T-30, P-30

Course Objectives

To impart knowledge to make the students

1. To understand the Object model and relationship among objects
2. To gain knowledge in C++programming
3. To design algorithms using C++

UNIT I

Object oriented language fundamentals – programming basics – Conditional statements – Structures – Functions - Objects and Classes – Constructors – Overloading.

UNIT II

Inheritance – Hierarchy - Derived class – Access specification - Polymorphism – virtual functions – virtual class – Files - Exception Handling.

UNIT III

Introduction to algorithms, Analyzing algorithms. Divide and Conquer: General Method, Binary Search, Merge sort, Quick sort.

UNIT IV

Greedy Method: Knapsack problem, Job sequencing with deadlines, Minimum spanning trees, Single source shortest paths. Dynamic Programming: Multistage graphs, All pairs shortest paths, Travelling salesperson problem.

UNIT V

Back Tracking: 8-queens problem, Sum of subsets, Graph coloring, Hamiltonian cycles. Branch and Bound: General method, Travelling salesperson problem.

REFERENCES

1. BjarneStroustrup, “The C++ Programming Language”, Addison Wesley, 4th Edition, 2013.
2. Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, “Fundamentals of Computer Algorithms”, Galgotia Publications, 2011.
3. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, “Introduction to Algorithms”, Massachusetts Institute of Technology, MIT Press, III Edition, 2009.
4. M.A.Weiss, “Data Structures and Algorithm Analysis in C++”, Pearson Education Asia,2013.
5. www.spoken-tutorial.org

Course Outcomes

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

CO1	To identify classes and objects from the given problem description and create classes and objects using C++	Understand
CO2	To achieve code reusability and extensibility by means of Inheritance and Polymorphism.	Apply
CO3	To differentiate among various algorithmic approaches	Understand
CO4	To design algorithms for problem solving by using the suitable algorithmic technique.	Apply
CO5	To analyze a given algorithm for its efficiency based on time and space it occupies.	Apply
CO6	To apply optimization techniques for improving the performance of algorithms.	Analyze

Course Prepared by : Dr. T. Amudha

Course Verified by : Dr. T. Devi

WORD PROCESSING

Course Code : 18CSEAC06

Number of Credits: 2

Subject Description:

This course presents the basics of Word processing

Goal:

To enable the students to learn the basics of Word processing.

Objectives:

On successful completion of the course the students should have:

- Understood Word processing concepts

UNIT-I

Introduction - Objectives -What is Word-Processing -Important Features of Ms-Word -
Getting Started with Ms-Word

UNIT-II

Editing - cut, paste- copy to clipboard - creating icon - Creating group items - Character
Formatting -Line Spacing - Alignment - Boarding and Shading - Page Breaks - Columns -
Changing Case

UNIT-III

Introduction to common office tools and techniques- sharing information within MS office -
word basics - formatting text documents - working with header, footer and footnotes.

UNIT-IV

Tabs- tables and sorting - graphics - templates writer tools - macros - keyboard shortcuts -
menus - custom toolbars.

UNIT-V

Mail Merge - Introduction -Objectives - What is Mail Merge - Concepts of Mail Merge and
its Components - Mail Merge option of word - Merged Printing - Conditional Merging

REFERENCE BOOKS

1. Joan Preppernau, "Microsoft Word 2016 Step by Step", Microsoft Press, 2016
2. Dan Gookin, "Office 2016 All-In-One For Dummies", Wiley, 2016

Course Title : Management Information Systems

No. of Credits:4

Course Code :18CSEAC07

No. of Teaching Hours:T-60, P-0

UNIT I

Foundations of Information Systems in Business: Real World of Information Systems (IS) – Fundamental Roles of IS in Business – Role of e-Business in Business – Types of Information Systems – Managerial Challenges of Information Technology

Components of Information Systems: Fundamentals of system concepts – Components of Information Systems – Information System Resources – Information System Activities – Recognizing Information Systems

UNIT II

Fundamentals of Strategic Advantage: Strategic Information Technology (IT) – Competitive Strategy Concepts – Strategic Uses of IT – Building a Customer-Focused Business – Value Chain and Strategic IS – Strategic uses of IT – Reengineering Business Processes – Becoming an Agile Company – Creating a Virtual Company – Building a Knowledge-Creating Company – Knowledge Management Systems

UNIT III

Enterprise Business Systems: Customer Relationship Management (CRM) – CRM Goes Mobile – Three Phases of CRM – Benefits and Challenges of CRM – Trends in CRM – **Enterprise Resource Planning (ERP):** Introduction – Benefits and Challenges of ERP – Trends in ERP – **Supply Chain Management (SCM):** Introduction – Role of SCM – Benefits and Challenges of SCM – Trends in SCM

UNIT IV

e-Commerce Systems: Introduction to e-Commerce – scope of e-Commerce – Essential e-Commerce Processes – Electronic Payment Processes - e-Commerce Trends – Business to Consumer e-Commerce – Web Store Requirements – Business-to-Business e-Commerce – **Decision Support in Business:** Introduction – Decision Support Trends – Decision Support Systems – Online Analytical Processing – Using Design Support Systems – Executive Information Systems – Knowledge Management Systems

UNIT V

Worksheets for Decision Support – Basic Spreadsheet modelling – Range – Lookup – Index – Match – Text functions – IF Statement – Sensitivity Analysis – Goal Seek Command – Using Pivot table – Data Model – Power pivot – Power View and 3D maps - Summarising – Filtering and Consolidating – Case Studies

REFERENCE BOOKS

1. James A. O'Brien, George M. Marakas, 'Management Information Systems', McGraw Hill, 10th Edition, 2007.
2. Kenneth C. Laudon, Jane P. Laudon, 'Management Information Systems: Managing the Digital Firm', Pearson Education, 12th Edition, 2012.
3. Steven Alter, 'Information Systems – The Foundation of E-Business', Pearson Education, 4th Edition, 2002.
4. Wayne Winston, Microsoft Excel Data Analysis and Business Modeling (5th Edition), Microsoft Press; 5 edition, 2016, ISBN-10: 1509304215, ISBN-13: 978-1509304219

Course Title : Operations Research

No. of Credits:4

Course Code : 18CSEAC08

No. of Teaching Hours:T-60, P-0

Course Objectives

To impart knowledge to make the students

1. To understand linear programming methods
2. To understand network analysis methods

UNIT I

Linear Programming: Introduction, Mathematical Formulations, Solutions, Graphical Method, Simplex Method, Artificial variables, BigM, Two phase methods, Variants in Simplex Method, Duality Theory and Problems, Dual Simplex Method.

UNIT II

Transportation and its variants: Definition, Transportation Algorithms and Solutions, Assignment Model, Hungarian Method, Traveling Salesman Problem, The Transshipment Model – Queueing Theory: - Characteristic of Queueing System, Steady State M/M/I Model Finite.

UNIT III

Inventory Theory: Cost Involved in Inventory Problems, Single Item Deterministic Models, and Economic Size Model with and without Shortages having Production Rate Infinite and Finite.

UNIT IV

PERT and CPM: Arrow Networks, Time Estimates, Various Expected Times, Critical Path, Critical Path Computations, Various Floats of Activities, Updating Projects Operation Time Cost.

UNIT V

Operations Research Models using Spreadsheets – Linear Programming Models: A Manufacturing Example - Computational Considerations - Terminology – Solution Characteristics Network Flow Programming Models: Classical Models – Extensions of the Basic Models - Minimum Cost Flow Problem – Distribution and Networks: anyone Case Study from Routing of goods, electricity and digital data

REFERENCES

1. Handy A Taha, “Operations Research- An Introduction”, Macmillan Publishing Co., 7th Edition (2004).
2. Sharma J K, “Operations Research - Theory and Application”, Mac Millan India: 2003.
3. Srivastava, U.K., Shenoy, G.V., and Sharma, S.C. (2009). Quantitative Techniques for Managerial Decision, 2/e; New Delhi: New Age International

4. Paul A. Jensen and Jonathan F. Bard, Operations Research Models and Methods, John Wiley Inc., 2003 <http://www.me.utexas.edu/~jensen/ORMM>, (for Unit V)

Course Outcomes

On successful completion of the course the students should have:

CO1	To identify the Transportation and Assignment problems and to optimize in engineering fields	Understand
CO2	To solve linear programming techniques to optimization problems arising in all Computer fields	Apply
CO3	To apply Travelling Salesman problem and Transshipment problem.	Apply
CO4	To summarize the inventory and queuing models	Apply
CO5	To classify the various scheduling techniques in Project	Understand
CO6	To design Operations Research Models using Spreadsheets	Analyze

Course Prepared by : Dr. V. Bhuvaneshwari

Course Verified by : Dr. T. Devi

Course Title : Relational Database Management System **No. of Credits:4**

Course Code :18CSEAC09 **No. of Teaching Hours:T-30, P-30**

Course Objectives

To impart knowledge to make the students

1. To understand the basic principles of database management systems, parallel & distributed database.
2. To Gain knowledge over various database models, schemes and SQL statements.

UNIT I

Introduction – purpose of database system - data models – database languages - Transaction management – Storage management - DBA –database users - system structure, E-R model.

UNIT II

Relational Database Design: Anomalies in a Database – Functional Dependency – Lossless Join and Dependency – Preserving Decomposition – Third Normal Form – BoyceCodd Normal Form – Multivalued Dependency – Fourth Normal Form – Join Dependency – Project Join Normal Form – Domain Key Normal Form. SQL: Data Definition – Data Manipulation – Integrity Constraints– Views–PL/SQL.

UNIT III

Indexing and Hashing – Query Processing – Transaction Processing – Concurrency Control and Recovery.

UNIT IV

Advanced Database Concepts and Emerging Applications: Distributed Databases – Object Oriented Databases - Object Relational Databases- Data mining and Data Warehousing.

UNIT V

DBMS Case Studies: Application of DB concepts in Hospitals or any small and medium scale Industry– DBMS in Hospital management System, Small and Medium Scale Enterprises– Application of DBMS in Marketing (For Unit V, students are expected to do a survey and study and submit a report)

REFERENCES

1. Abraham Silberchatz, Henry K.Forth, Sudharshan, “Database system Concepts” – (6th edition), McGraw Hill, 2010.
2. Elisa Bertino, “Object Oriented Databases”, Addison Wesley. 1993.
3. Ramez Elmasri, Shamkant B. Navathe, " Fundamentals of Database Systems ", 3rd Edition, Addison Wesley-2000.
4. Malay k. Pakhira, “Database Management System”, Phi Learning Pvt. Ltd., 2012
5. www.spoken-tutorial.org

Course Outcomes

On successful completion of the course the students should have

CO1	To explain the significance of Database Management principles and practices	Understand
CO2	To learn the basics of DBMS and SQL Commands	Understand
CO3	To understand emerging Applications and advance concepts of DBMS	Understand
CO4	To develop case study on different Applications using DBMS & SQL commands	Apply

Course Prepared by : Dr. M. Punithavalli

Course Verified by : Dr. T. Devi

Course Title : Software Engineering

No. of Credits:4

Course Code :18CSEAC10

No. of Teaching Hours:T-60, P-0

Course Objectives

To impart knowledge to make the students

1. To understand the role of software engineering
2. To understand the design concepts, testing methods and strategies

UNIT I

Software Engineering Introduction: Role of Software – Software Characteristics – The Software Process – Overview of CMMI – Prescriptive Process Models: The Waterfall Model, Incremental Models (Incremental and RAD) - Evolutionary Process Models (Prototyping, Spiral and Concurrent Development) – Agile Process Models.

UNIT II

Software Requirements: Functional and non-functional – user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping –S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT III

Design Engineering: Design Engineering Concepts – Design model – Pattern-Based Software Design - Architectural Design: Software Architecture – Mapping data flow into an architecture (Transform Mapping and Transaction Mapping) - Component-Level Design: Introduction Designing conventional components.

UNIT IV

Testing: Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues – unit testing – integration testing – validation testing – system testing and debugging.

UNIT V

Software Engineering Case Studies: Application of SE concepts in Hospitals or any small and medium scale Industry – SE in Hospital management System, Small and Medium Scale Enterprises – Application of SE in Marketing (For Unit V, students are expected to do a survey and study and submit a report)

REFERENCES

1. Roger S. Pressman., Software Engineering, Sixth Edition, McGraw Hill, 2010.
2. Sommerville I., Software Engineering, Ninth Edition, Pearson Education Asia, 2010.
3. R. S. Pressman, “Software Engineering”, (7th edition), Tata McGraw Hill, 2009, ISBN- 10: 0073375977 2. R. S. Pressman, “Software Engineering”, (5th edition), Tata McGraw Hill, 1997.
4. PankajJalote, “An Integrated Approach to Software Engineering”, Third Edition, Narosa Publishing House, 2005.
5. Richard F Schmidt, “Software Engineering: Architecture-driven Software Development”, 2013

Course Outcomes

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

CO1	To understand the role of Software engineering	Understand
CO2	To gather and specify requirement of software engineering	Understand
CO3	To learn design concept	Understand
CO4	To write test cases	Understand
CO5	To apply Software Engineering concepts in Software development	Apply

Course Prepared by : Dr. M. Punithavalli

Course Verified by : Dr. T. Devi

Course Title :Data Visualization

No. of Credits:4

Course Code : 18CSEAC11

No. of Teaching Hours:T-30 P-30

Course Objectives

To impart knowledge to make the students

1. To understand how accurately represent voluminous complex data set in web and from other data sources
2. To understand the methodologies used to visualize large data sets
3. To know how to work with visualization tools.

UNIT I

INTRODUCTION: Context of data visualization – Definition, Methodology, Visualization design objectives. Key Factors – Purpose, visualization function and tone, visualization design options – Data representation, Data Presentation, Seven stages of data visualization, widgets, data visualization tools. **VISUALIZING DATA METHODS:** Mapping - Time series - Connections and correlations - Scatter plot maps - Trees, Hierarchies and Recursion - Networks and Graphs, Info graphics.

UNIT II

INTERACTIVE DATA VISUALIZATION: Introduction to D3 - Fundamental Technology - Drawing with data – Scales – Axes – Updates, Transition and Motion – Interactivity - Layouts – Geomapping – Exporting- **Data to create Visualizationwith SVG** - SVG – Styling CSS – Shapes – SVG Properties – SVG Text - Drawing – Transformations – Building Chart with SVG (Scalable Vector Graphics) - Shaping Web Pages – Selections – Attributes – Chaining Methods –Data Joins - Sizing – scales – axes – Loading – Filtering – Interactive Charts – Buttons using Data Join – Transition using Key

UNIT III

D3-BASED REUSABLE CHART LIBRARY: Introduction to D3 – Setup and Deployment – Generate Chart – Customize Chart – How to Use APIs – Customize Style – Building Real time and Live Updating animated graphs with C3.

UNIT IV

TABLEAUE INTRODUCTION: Environment Setup – Navigation – File & Data Types. **DATA SOURCE:** Custom Data View – Extracting Data – Fields Operations – Editing Meta Data – Data Joining – Data Blending. Worksheets

UNIT V

TABLEAUE CHARTS: Bar Chart – Line Chart – Pie Chart – Scatter Plot – Bubble Chart – Gantt Chart – Histograms - Waterfall Charts. **ADVANCED:** Dashboard – Formatting – Forecasting – Trend Lines

REFERENCES

1. Ben Fry, “Visualizing Data”, O’Reilly Media, Inc., 2007.
2. Scott Murray, “Interactive data visualization for the web”, O’Reilly Media, Inc., 2013.
3. Ritchie S. King - *Visual Storytelling with D3 – An Introduction to Data Visualization with D3*, Addison-Wesley- *Data Analytic Series*, ISBN 10: 0321933176
4. Elijah Meeks , *D3.js in Action*, Second Edition: Data visualization with JavaScript, Publisher: Manning Publications, 2017 , ISBN: 9781617294488
5. <http://c3js.org/gettingstarted.html>
6. <https://www.tutorialspoint.com/tableau/index.htm>
7. <https://www.tableau.com/learn/training>.
8. <https://www.dashingd3js.com/table-of-contents>
9. WWW.udacity.com-Data Visualization and D3.J

Course Outcomes

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

CO1	Understand the concepts of visualization	Understand
CO2	Understand the methods for visualizing data in D3j, c3j, and Tableau	Remember
CO3	Apply Visualization methods for different data domains	Analyze
CO4	Design Interactive Charts based on Data	Apply
CO5	Distinguish and Suggest the appropriate data visualization tools for domain specific applications	Analyze
CO6	Design an Interactive data visualization story board for data	Evaluate

Course Prepared by : Dr.V.Bhuvaneswari

Course Verified by : Dr. T. Devi

Course Title : Advanced Java Programming

No. of Credits:4

Course Code :18CSEAC12

No. of Teaching Hours:T-30, P-30

Course Objectives

To impart knowledge to make the students

1. To gain knowledge in web page designing, component designing and designing distributed applications using Java.

UNIT I

Collections Framework: Collection classes and Interfaces – Legacy classes – Date – Calendar – Time Zone. Event Handling: Exploring Swing – JFrame – JComponent – Text Fields – Buttons – Combo boxes – Application design using Swing components.

UNIT II

Database Programming in Java: Overview of the JDBC Process - JDBC Concepts - JDBC Drivers – Database Connection - Statement Objects – The Connection Interface – Result Set – Interacting with the database - Transaction Processing.

UNIT III

Java Networking: Remote Method Invocation (RMI)-Distributed Application Architecture– Client proxy and Server Proxy – RMI process - Defining and using Remote objects.

UNIT IV

Java Servlets: Initialization–Deployment–Reading Client Data–Reading HTTP Request Headers – Cookies - Session Tracking – Database Connections. Java Server Pages (JSP) - JSP tags - Components of a JSP page - Expressions–Scriptlets – Directives – Declarations - Working with JSP- JSP and JDBC- JQuery - AJAX.

UNIT V

Application Development Environment: Overview of MVC architecture – Struts: Working principle of Struts – Building model components – View components – Controller components –Developing Web applications – Spring: Framework – Controllers – Developing simple applications.

REFERENCES

1. Herbert Schildt, “The Complete Reference Java”, Tata McGrawHill Publishing Company Ltd, 2012.
2. Marty Hall, Larry Brown, Yaakov Chaikin, “Core Servlets and Java Server pages”: Volume 2 – Advanced Technologies, II edition, Pearson education, 2008.
3. Jamie Jaworskie, ”Java 2 Platform Unleashed”, Techmedia SAMS, IV edition, 2008.
4. Craig Walls, “Spring in Action”, IV edition, Manning Publications, 2015.
5. www.spoken-tutorial.org

Course Outcomes

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

CO1	To recognize the role of Java technology in project development	Understand
CO2	To design distributed applications and build projects using Java technology	Apply
CO3	To interact with databases and perform database transactions	Apply
CO4	To understand the networking features of Java and communicate across applications.	Apply
CO5	To design and deploy web-based applications in Java	Apply
CO6	To understand various Java frameworks and apply the suitable framework for developing Java applications.	Analyze

Course Prepared by : Dr. T. Amudha

Course Verified by : Dr. T. Devi

Course Title : Computer Networks

No. of Credits:4

Course Code :18CSEAC13

No. of Teaching Hours: T-30, P-30

Course Objectives

To impart knowledge to make the students

1. To Understand the functionality of networks protocols and layers
2. To understand network simulation using NS2

UNIT I

INTRODUCTION TO NETWORKS & COMMUNICATION MEDIA: Uses –Network hardware–Network software–Reference Models–Example Networks: Internet–X.25–ATM–Transmission media–Wireless Transmission–Telephone system–ISDN, ATM communication –Satellite communication.

UNIT II

DATA TRANSFER & ACCESS PROTOCOLS: Error detection and correction methods–Elementary protocols –Sliding window protocols –IEEE 802.2 Logical Link Control –Bluetooth: architecture–protocol stack–radio layer–baseband layer–L2CAP layer–frame structure.

UNIT III

NETWORK LAYER PROTOCOLS: Routing algorithms Congestion control: Principles – policies–Congestion control in VC subnets –congestion control in datagram subnets–Network layer in Internet: Architecture–IP protocol–IP Address–IPv6.

UNIT IV

TRANSPORT PROTOCOLS: Transport service–Transport protocols Transport protocols in Internet: TCP and UDP

UNIT-V

APPLICATION LAYER ISSUES:–Domain Name System –Electronic mail–Network security. Network Simulator: Basics of Computer Network Simulation –Introduction to Network Simulator 2 (NS2) –Basic Architecture–Installation–Directories and Convention–Running NS2 Simulation–Simulation Examples

REFERENCES

1. Andrew S. Tanenbaum, “Computer Networks”, PHI, 5th Edition, 2013
2. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw Hill, 4th Edition, 2006
3. William Stallings, “Data and Computer Communication”, 7th Edition, Pearson Education, 2007
4. Teerawat Ussaruyakul, Ekram Hossain, Introduction to Network Simulator NS2, Springer, 2009

Course Outcomes

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

CO1	To describe the network concepts with suitable examples	Understand
CO2	To explain the reference models of networks.	Understand
CO3	To discuss on the Data transfer and access protocol.	Understand
CO4	To examine the network layer protocols and its algorithm	Apply
CO5	To examine the Transport layer protocols and its algorithm	Apply
CO6	To summarize the issues in application layer	Understand

Course Prepared by : Dr. J. Satheeshkumar

Course Verified by : Dr. T. Devi

Course Title : Software Project Management

No. of Credits:4

Code: 18CSEAC14

Course Code :3

No. of Teaching Hours:T-60, P-0

Course Objectives

To impart knowledge to make the students

1. To understand the Software configuration management
2. To understand the Activity Planning, Risk Management using case studies

UNIT I

Introduction to Software Project Management- Software project versus other types of project-problems- management control- Stakeholders- Requirement Specification – Information and control in organizations Introduction to step wise project planning- Select-identify scope and objectives identify project infrastructure- Analyze project characteristics- products and activities- Estimate effort for each activity- Identify activity risks- Allocate resources- Review/ publicize plan- Execute plan and lower levels of planning. Project evaluation- Introduction – Strategic assessment- technical assessment cost benefit analysis- cash flow forecasting- cost-benefit evaluation techniques risk evaluation

UNIT II

PROJECT LIFE CYCLE AND EFFORT ESTIMATION Software process and Process Models – Choice of Process models - mental delivery – Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points - COCOMO II A Parametric Productivity Model - Staffing Pattern.

UNIT III

Risk Management- nature of risk- managing- identification-analysis reducing- evaluating- z values. Resource allocation- nature of resources requirements- scheduling- critical paths-counting the cost-resource schedule cost schedule- scheduling sequence. Monitoring and control- creating the frame work- collecting the data- visualizing the progress- cost monitoring- earned value- prioritizing, monitoring-Change control.

UNIT IV

Managing contracts-types of contract-stages in contract placement-terms of a contract-contract management-acceptance. Managing people and organizing teams-organizational behavior background-selecting the right person for the job-instruction in the best methods-motivation-decision making-leadership-organizational structures. Software quality-importance-defining-ISO9126-practical measures-product versus process quality management-external standards-techniques to help enhanced software quality.

UNIT V

Case Studies - Application of SPM concepts in Hospital information systems or information systems of any small and medium scale Industry – SPM in Hospital information management System, Small and Medium Scale Enterprises – Application of SPM in Marketing (For Unit V, students are expected to do a survey and study and submit a report)

REFERENCES:

1. Robert K. Wysocki “Effective Software Project Management” – Wiley Publication, 2011.
2. Walker Royce: “Software Project Management”- Addison-Wesley, 1998.
3. Gopalaswamy Ramesh, “Managing Global Software Projects” – McGraw Hill Education (India), Fourteenth Reprint 2013.
4. Mike Cotterell, Bob Hughes, “Software Project Management”, Inclination/Thomas Computer Press, 1995.
5. Darrel Ince, H.Sharp and M.Woodman, “Introduction to Software Project Management and Quality Assurance”, Tata McGraw Hill, 1995.
6. Ramesh Gopalasamy, “Managing Global Software Projects”, 2005.

Course Outcomes

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

CO1	To learn software planning, project management, activity planning	Understand
CO2	To learn Selection of process model, effort and cost estimation techniques	Understand
CO3	To learn Monitoring, scheduling and Risk Management	Understand
CO4	To learn People management	Understand
CO5	To apply Software project Management concept	Apply

Course Prepared by : Dr. M. Punithavalli

Course Verified by : Dr. T. Devi

Course Title : Computer Security and Cryptography

No. of Credits:4

Course Code :18CSEAC15

No. of Teaching Hours:T-60, P-0

Course Objectives

To impart knowledge to make the students

1. To understand the concepts in encryption, cryptography
2. To understand the concepts of system security and database security
3. To understand the ethical issues in computer security

UNIT I

Introduction: Introduction to security attacks - services and mechanism - introduction to cryptography - Classical Encryption Techniques – Network Security Model – Data Encryption Standard-Triple DES-block cipher modes of operations –Different types of ciphers- Electronic Mail Security-IP Security- Web Security

UNIT II

Public Key Cryptography: Number Theory concepts – Primality – Modular Arithmetic – Fermat & Euler Theorem – Euclid Algorithm – RSA Algorithm – Elliptic Curve Cryptography – Diffie Hellman Key Exchange - Cryptographic hash functions - Cipher Block Chaining - Secure Hash Algorithm - Digital Signature: Schnorr Digital Signature Scheme -Digital Signature Standard – Kerberos

UNIT III

System Security: Intruders-Intruder Detection-Password management- Viruses- virus countermeasures-worms-DOS attack- Types of Firewalls – Firewall Designs – SET for E-Commerce Transactions -Secure Socket Layer-Security standards

UNIT IV

Operating System and Database Security: Internet Key Exchange (Phases of IKE), PGP - Access Control – File Protection mechanism- User Authentication-Wireless application protocol (WAP) – Protocol overview – Detecting conficker with Nmap- Security Requirements- Multilevel database.

UNIT V

Ethical and Legal Issues in Computer Security: Cybercrime- Computer Crime-Copyrights- patents-Information and law-Ethical issues-case studies.

REFERENCES

1. William Stallings, “Cryptography & Network Security”, Pearson Education, 5th edition. New Delhi 2005.
2. Charles P. Pfleeger, Shari L. Pfleeger, “Security in Computing”, Prentice Hall, 4th edition. 2003.

Course Outcomes

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

CO1	To explain the structure and model of the Network Security Model	Understand
CO2	To design the example for RSA	Apply
CO3	To design the types of firewalls system	Analyze
CO4	To explain the security requirements in the multilevel database	Apply
CO5	To explain the security standards in the secure socket layer	Analyze
CO6	To understand what are the legal issues in computer security	Understand

Course Prepared by : Dr. S. Gavaskar

Course Verified by : Dr. T. Devi

Course Title : Soft Skills-I

No. of Credits:4

Course Code :18CSEAC16

No. of Teaching Hours: T-40, P-20

Course Objectives

To impart knowledge to make the students

1. To understand the basics of communication skills and soft skills
2. To acquired knowledge in technical programming and quantitative aptitude

UNIT I

Introduction to Communication – Importance – Basics of Communication – Purpose and Audience - Language as a Tool of Communication – Communicative Skills - Modes of Communication – Active Listening-Introduction - Traits of a Good Listener – Listening Modes – Effective Speaking: Achieving Confidence, Clarity and Fluency – Paralinguistic Features – Types of Speaking

UNIT II

Personality Development: A Must for Leadership and Career Growth – Swami Vivekananda’s Concept of Personality Development – Interpersonal Skills -Soft Skills: Introduction to Soft Skills – Classification of Soft Skills-Case study: Resume Writing-Email-letter Writing-Self Introduction.

UNIT III

Technical programming skill: Variables and keywords - Operators in C – Decision Making– Looping - Branching Statements –Array – Functions.

UNIT IV

Quantitative Aptitude1: Number series -Ratio, Proportion and Partnership – Problems on Ages - Average - Profit and Loss.

UNIT V

Quantitative Aptitude2: Simple Interest – Compound Interest – Time and Work – Time and Distance.

REFERENCES

1. Raman Sharma, “Technical Communication“, 2ndEdition, Oxford University Press 2011.
2. Barun K. Mitra“Personality Development and Soft Skills“, Oxford University Press 2011.
3. Dr. Balagurusamy, “Programming in C”, Tata McGraw – Hill Edition, 2008. 4. S. Chand and Ashish Aggarwal, “Quick Arithmetic” Sixth Revised Edition.

Course Outcomes

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

CO1	To understand the basics of communication skills and Develop confidence, clarity, fluency through active involvement	Understand
CO2	To understand logical skills, analytical skills and apply in software applications	Understand
CO3	To development of interpersonal skills, listening through (seminar, self intro, stage speaking)	Apply
CO4	To improve writing skills through various modes (letter writing, resume writing)	Apply
CO5	To practice technical programming, cracking code, simple logic and concepts	Remember/Analyze
CO6	To apply and solve problems of quantitative aptitude	Apply
CO7	To apply communication skills, writing Skills, logical Skills and technical skills to present himself	Evaluate

Course Prepared by : Dr. V. Bhuvaneshwari

Course Verified by : Dr. T. Devi

DATA ANALYSIS AND PRESENTATION TOOLS

Course Number: 18CSEAC17

Number of Credits: 2

Subject Description:

This course presents the basics of Excel and Powerpoint .

Goal:

To enable the students to learn the basics of Excel and Powerpoint.

Objectives:

On successful completion of the course the students should have:

- Understood Excel and Powerpoint concepts

UNIT-I

Excel basics- creating workbook, worksheets-Rearranging worksheets - naming worksheets.

UNIT-II

Excel formatting tips and techniques- creating and naming arrange- sorting-filtering- auto filter-advanced filter-goal seek-scenario - Filter and sort table data - Work with pivot tables and charts - Import and export data.

UNIT-III

An introduction to function-mathematical function-financial function-excel chart features working with graphics in Excel.

UNIT-IV

Power point basics-using text- adding visual elements-charts and tables

UNIT-V

Drawing-clipart-sounds-animation-apply time transitions to slides - Add sound and video to a slide presentation.

REFERENCE BOOKS

1. Joan Preppernau, "Microsoft Office 2016 Step by Step", Microsoft Press, 2016
2. Dan Gookin, "Office 2016 All-In-One For Dummies", Wiley, 2016

Course Title : Open Source Programming

No. of Credits:4

Course Code :18CSEAC18

No. of Teaching Hours:T-40, P-20

Course Objectives

To impart knowledge to make the students

1. To understand the basics of open source software
2. To create dynamic web applications using PHP, MySQL and AJAX

UNIT I

Introduction to Open Source: Overview of free/ open source software: history – advantages – disadvantages – Open Source business models– Open Source Licenses: types – MIT license – BSD licenses – dual licensing – Free/ Open source software examples

UNIT II

Basics of PHP Programming: PHP Programming: Introduction – Syntax – Variables - Controls and functions – Strings -Arrays: Using Arrays, Manipulating Arrays, Associative Arrays – Advanced Array Functions

UNIT III

Object Oriented Programming with PHP: Object-Oriented Programming with PHP – Strings and Regular Expression Functions – File system and System Functions – Sessions, Cookies and HTTP

UNIT IV

PHP and MySQL: PHP and MySQL: SQL Tutorial – MySQL Database Administration – PHP/MySQL Functions – Displaying Queries in Tables – Building Forms from Queries

UNIT V

PHP and AJAX: PHP and AJAX: introduction – JavaScript and AJAX Client: JavaScript and DOM – XMLHttpRequest Object – AJAX form validation

REFERENCES

1. Dan Woods and GautamGuliani, „Open Source for the Enterprise“, OReilly Media, 2005.
2. Tim Converse and Joyce Park, „PHP 5 and MySQL Bible“ Wiley Publishing, 2004.
3. BogdanBrinzarea-lamandi, CristianDarie and Audra Hendrix, „AJAX and PHP“, Packt Publishing, 2009.
4. Joseph Feller, Brain Fitzgerald and Eric S. Raymond, “Understanding Open Source Software Development”, Addison -Wesley Professional, 1st Edition, 2001.
5. Jason Gilmore, „Beginning PHP and MySQL“, Dreamtech Press, Fourth Edition, 2010.
6. Rajesh JebaAnbiah, RoshanBhattarai and Milan Sedliak, „PHP Ajax Cookbook“, Packt Publishing, 2011.
7. www.spoken-tutorial.org

Course Outcomes

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

CO1	To explain the significance of open source principles and practices	Understand
CO2	To learn the basics of PHP and MySQL	Understand
CO3	To develop web applications using PHP and MySQL	Apply
CO4	To develop web applications using PHP and AJAX	Apply

Course Prepared by : Dr. R. Rajeswari

Course Verified by : Dr. T. Devi

Course Title : Mobile Programming

No. of Credits:4

Course Code :18CSEAC19

No. of Teaching Hours:T-30, P-30

Course Objectives

To impart knowledge to make the students

1. A good understanding on the Mobile Environment
2. To acquired mobile application development skills with Android.

UNIT I

Introduction to Mobile Applications: Native and web applications - Mobile OS and Databases. Introduction to Android: History - Features – OSS – OHA - Versions - Android devices - Setting up software – IDE - XML. Introduction to Objective C and iOS – iOS features –user interface - Using Wifi – iPhone marketplace.

UNIT II

Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications development -Virtualization – APIs – Android File system – A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity.

UNIT III

Intents – Intent Filters – Activity stack. Android Services: Simple services – Binding and Querying the service – Executing services. Broadcast Receivers: Creating and managing receivers – Receiver intents. Content Providers: Creating and using content providers – Content resolver.

UNIT IV

Android UI - Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame – Menus - Lists and Notifications - Input Controls: Buttons - Text Fields – Checkboxes - alert dialogs – Spinners - rating bar - progress bar.

UNIT V

Working with databases: SQLite – coding for SQLite using Android - Publishing and Internationalizing mobile applications - mobile application deployment: Game, Clock, Calendar, Converter, Phone book.

REFERENCES

1. Barry Burd, “Android Application Development – All-in-one for Dummies”, 2nd Edition, Wiley India, 2016.
2. Lauren Darcey, Shane Conder, “Sams Teach Yourself Android Application Development in 24 hours”, 2nd edition, Pearson Education, 2013.

3. Jerome (J. F) DiMarzio, “Android – A Programmer’s Guide”, McGraw Hill Education, 8th reprint, 2015.
4. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.
5. <http://www.developer.android.com>

Course Outcomes

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

CO1	To explain the features and challenges of mobile devices, differences between native app development, web app development and hybrid app development	Understand
CO2	To apply the UI components, multimedia usage, permissions, Storage usage, read and write operations in storage	Apply
CO3	To apply HTML5 in UI design for the given problem	Apply
CO4	To design an application based on the user requirements	Apply

Course Prepared by : Mr. S. Palanisamy

Course Verified by : Dr. T. Devi

Course Title : Computer Graphics and Multimedia

No. of Credits:4

Course Code :18CSEAC20

No. of Teaching Hours: T-30, P-30

Course Objectives

To impart knowledge to make the students

1. To understand the Computer Graphics and the various graphic algorithms.
2. To understand the 2D and 3D transformations, models and generation techniques
3. To understand the Multimedia animation and Desktop Computing.

UNIT I

A Survey of Computer Graphics – Overview of Graphics Systems: Video Display Devices – Input Devices – Graphics Software.

UNIT II

Output Primitives: Points and Lines – Line Drawing Algorithms: DDA – Bresenham`s. Properties of Circles and Ellipses – Pixel Addressing. Two Dimensional Geometric Transformations: Basic Transformations – Matrix Representation – Composite Transformations.

UNIT III

Three-Dimensional Display Methods – Three Dimensional Geometric and Modeling Transformations: Translation – Rotation – Scaling – Composite Transformations - Color Models and Color Applications.

UNIT IV

Multimedia: Introduction, Definition, Uses of Multimedia, Delivering Multimedia, computer display Vs TV display - TEXT: Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext.

UNIT V

Images: Making Still Images - Image File Formats - 2 D, 3 D - Sound: Digital Audio - MIDI Audio - MIDI vs. Digital Audio - Audio File Formats - Adding Sound to Your Multimedia Project - Animation – Video: Analog, Digital - Digital Video Containers - Obtaining Video Clips - Shooting and Editing Video.

REFERENCES

1. Donald Hearn &M.Pauline Baker, “Computer Graphics”, Second Edition, PHI/ Pearson Education.
2. H.M.Neumann and R.F.Sproul, “Principles of Interactive computer Graphics”, Second Edition, McGraw Hill.
3. Steven Harrington, “Computer Graphics – A Programming Approach”, McGraw Hill, 1983.

4. John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley, „Computer Graphics: Principles and Practice“, Addison-Wesley Professional; 3 edition (July 20, 2013)
5. Multimedia Making It work – 9th Edition, Tay Vaughan, McGraw Hill, 2016

Course Outcomes

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

CO1	To have a basic understanding of the core concepts for activities involving in design, development and testing of modelling, rendering, shading and animation of computer graphics.	Understand
CO2	To be capable of using OpenGL to create interactive computer graphics.	Apply
CO3	Understand a typical graphics pipeline and made pictures with their computer.	Understand
CO4	To understand about various latest interactive multimedia devices, the basic concepts about images and image formats.	Understand
CO5	To understand about data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.	Understand
CO6	To develop an interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing multimedia applications surrounding the emergence of multimedia technology.	Apply

Course Prepared by : Dr. T. Devi

Course Verified by : Dr. T. Devi

Course Title : Internet Programming and Web Designing No. of Credits:4

Course Code :18CSEAC21

No. of Teaching Hours:T-30, P-30

Course Objectives

To impart knowledge to make the students

1. To understand the basics of web designing and internet programming
2. To develop interactive and dynamic web applications using HTML, JavaScript, CSS, XML and ASP.NET
3. To explore different standards of web services

UNIT I

Internet Basics and HTML: Internet Basics: Introduction–Getting Connection –Services -Mail – News Groups –FTP –HTTP –WWW –HTML5: Introduction –formatting and fonts - tables, images, frames, links and forms –multimedia

UNIT II

JavaScript: Cascading Style Sheets: types of style sheets –positioning elements –backgrounds – margins and padding – manipulating text and images - Java Script programming: form handling and validation–Document Object Model – Browser Management - Event model - ActiveX controls – JSON – jQuery

UNIT III

XML: Need for XML –Documentation –Elements and Attributes –Valid Documents - Document Type Definitions –XML Schema–Rendering XML with XSLT - using JavaScript and XML

UNIT IV

ASP.NET: Introduction to .NET Framework –.NET Languages -.NET Data Services: ADO.NET –Data Binding –Using XML –ASP.NET AJAX – ASP.NET Model-View-Controller (MVC) Application

UNIT V

Web Services: Web service fundamentals – web service technology stack – SOAP and REST – Accessing Public Web Services – Web Services and Windows Communication Framework (WCF)

REFERENCES

1. Harvey Deitel, Abbey Deitel, “Internet & World Wide Web –How to Program”, Fifth Edition, Pearson Education, 2012.
2. Kogent Learning Solutions, “HTML 5Black Book”, Dream Tech Publishers, 2011.
3. Scott Mitchell and James Atkinson, “Teach Yourself XML in 21 days”, Sams Publishing, 1999.
4. Matthew MacDonald, “ASP.NET: The Complete Reference”, Tata McGraw Hill, 2002.

5. Alex Ferrara and Matthew MacDonald, "Programming with .Net Web Services", O'Reilly & Associates Inc., First Edition, 2002.
6. Imaar Spaanjaars, "Beginning ASP.NET 4.5 in C# and VB", Wrox Publications, John Wiley & Sons, 2013.
7. Thomas Erl (Editor), "SOA with .NET", Prentice Hall Publications, First Edition, 2010.
8. www.spoken-tutorial.org

Course Outcomes

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

CO1	To learn the basics of Internet	Understand
CO2	To develop web pages using HTML and JavaScript	Apply
CO3	To develop web applications using ASP.NET	Apply
CO4	To develop web applications using XML and web services	Apply
CO5	To explain the concept of service-oriented architecture	Understand

Course Prepared by : Dr. R. Rajeswari

Course Verified by : Dr. T. Devi

Course Title : Data Mining

No. of Credits:4

Course Code :18CSEAC22

No. of Teaching Hours: T-30, P-30

Course Objectives

To impart knowledge to make the students

1. On successful completion of the course the students should have:
2. Understand the data mining techniques and its Applications.

UNIT I

Data mining: Introduction – Data as a Subject – Data Formats - Definitions- KDD vs. Data mining- DM techniques- Association Rules: Concepts- Methods to discover Association rules- A priori algorithm – Partition algorithm- Pincer search algorithm –Dynamic Item set Counting algorithm- FP-tree growth algorithm-Incremental Algorithm-Border Algorithm-Generalized association rule.

UNIT II

Introduction to R Programming – R Basics Data Structures – Vectors – Lists – Tuples – Data Frames – R Control Structures – IF – WHILE - Packages – Installing – Configuring R in Windows – Visualization using R – Lattice Package – ggplot – Packages - rpart – party – MASS – Linear Regression using R.

UNIT III

Clustering techniques: Clustering paradigms – Partition algorithm-K- Medeoid algorithms – CLARA- CLARANS –Hierarchical DBSCAN- BIRCH -Categorical clustering algorithms-STIRR-ROCK-- Introduction to neural network - learning in NN- Genetic algorithm- Case studies.

UNIT IV

Classification Technique: Introduction – Decision Trees: Tree Construction Principle - Decision Tree construction Algorithm – CART – ID3 – Random Forest - Pruning Text Mining – KDT – Text - Preprocessing - Clustering - Web mining: Basic concepts – Web content mining – Web structure mining – Web usage mining.

UNIT V

Introduction to Big Data –Big Data Road Map - 6 Vs – Big Data Ecosystem– Hadoop – Architecture - MapReduce – HBASE – Hadoop Limitation – SPARK Overview – Architecture - Applications of Big Data. – Data Analytics Classification – Descriptive – Diagnostic – Predictive – Diagnostic – Data Analytics – Case Studies – Data mining in Big Data.

REFERENCES

1. Jaiwei Han and MichelineKamber,” Data Mining Concepts and Techniques”, MorganKaufmann Publishers, 2011, 3rd Edition.
2. Arun K. Pujari, “Data mining Techniques”, Third Edition, Universities Press (India)Limited, Hyderabad, 2013.
3. Pieter Adriaans, DolfZantinge, “Data Mining”, Addison Wesley, 2008.
4. Krzysztof J Cios, WitoldPedrycz, “Data Mining: A Knowledge Discovery Approach”, Springer, 2010.
5. ArijayChaudhry, Dr. P .S Deshpande, “Multidimensional Data Analysis and Data Mining”, Dreamtech press, 2009.
6. <http://www.celta.paris-sorbonne.fr/anasem/papers/miscelanea/InteractiveDataMining.pdf>
7. V.Bhuvanewari, T.Devi, Big Data Analytics – A Practitioners Approach, Big Data Analytics ,Bharathiar University 2016.
8. V.Bhuvanewari, R Programming – A Step by Step , , 2016,
9. Big Data Analytics BeyondHadoop, VIJAY SRINIVAS AGNESWARAN, Pearson.

Course Outcomes

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

CO1	To understand data mining tools and techniques and Big Data for various domains	Remember Understand
CO2	To apply various data mining, text mining and web mining algorithms for real time applications	Apply
CO3	To analyze unsupervised and supervised algorithms for real world applications	Analyze
CO4	To illustrate the mining techniques like association, classification and clustering on datasets	Evaluate
CO5	To apply R Programming Packages for mining data	Apply
CO6	To compare various approaches of data mining algorithms	Evaluate

Course Prepared by : Dr. T. Devi

Course Verified by : Dr. T. Devi

Course Title : Soft Skills - II

No. of Credits:4

Course Code :18CSEAC23

No. of Teaching Hours:T-40, P-20

Course Objectives

To impart knowledge to make the students

1. To understand the basics of verbal and non-verbal reasoning, technical programming skills using C++,
2. To acquired knowledge of using soft skills and the interview-based topics in DBMS and Computer Networks.

UNIT I

Verbal Reasoning: General Mental Ability-Coding-Decoding-Blood Relation-Logical Venn Diagram- Mathematical Operations - Arithmetical Reasoning - Truth statement.

UNIT II

Non-Verbal Reasoning-Series-Choosing the Missing Figure in a Series-Detecting the Incorrect Order-Detecting the Wrong Figure-Analytical Reasoning-Rule Detection-Construction of Boxes-Figure Formation and Analysis -Formation of a Figure from Parts-Formation of a Figure Fragmentation-Identical Figure-Pattern Rearrangement

UNIT III

Technical skill: Concepts of OOPS-Object and Classes - Inheritance – Polymorphism – Data Hiding– Virtual Function - Operator Overloading – Function Overloading

UNIT IV

Interviews, Group Discussions, Presentation Skills, Conversation: Effective Presentation Strategies-Planning-Nuances of Delivery- Controlling Nervousness and Stage Fright-Visual Aids in Presentations- Job Interviews-Media Interviews- Communication-Group Discussions-GD as Part of a Selection Process.

UNIT V

Theoretical Concepts – DBMS: Keys-Normalization-RDBMS-Concurrency Control Software Engineering: Models-Design Strategies – Testing-Operating System – Process-Memory Management – Paging-Dead Lock-Virtual Memory-Computer Networks – OSI-TCP/IP-Communication Modes-N/W Devices.

REFERENCES

1. Dr. R. S. Aggarwal and S. Chand”A Modern Approach to Verbal & Non-Verbal Reasoning” Revised Edition
2. Dr. Balagurusamy,” Object Oriented Programming with C++” Tata McGraw-Hill Edition, 2008
3. Raman Sharma, “Technical Communication-Principles and Practices”, Second Edition

Course Outcomes

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

CO1	To understand the basics of mental ability, logical ability through active involvement	Understand
CO2	To understand analytical reasoning and apply in software applications	Understand
CO3	To development of programming and database management skills	Apply
CO4	To improve Presentation Skills, Controlling Nervousness and Stage Fright, Communication via Group Discussions	Apply
CO5	To practice technical programming, cracking code, simple logic and concepts	Remember/Analyze

Course Prepared by : Dr. V. Bhuvaneshwari

Course Verified by : Dr. T. Devi

INTERNET & HTML PROGRAMMING

Course Code : 18CSEAC24

Subject Description:

This course presents the basics of Internet and HTML

Goal:

To enable the students to learn the basics of Internet and HTML

Objectives:

On successful completion of the course the students should have:

- Understood Internet and HTML concepts

UNIT I :

Internet Basics : Origin of Internet - ARPANET - Protocol - Packet switching theory -TCP/IP - IP address (classification), Domain name system (Concept of DNS Server) -Router.

UNIT II :

Routing Algorithm (just introduction) - Direct & Dial up Networking - MODEM -ISP(VSNL) Services (shell & TCP/IP ACC.) Up load, down load Protocols(ZMODEM,KERMIT etc.)

UNIT III :

Email - Newsgroup -FTP - Gopher - Origin of WWW - Origin of HTML - URL – Browsers(Text & Graphics) - HTTP - Search Engines (Purpose & Facilities, Yahoo, Altavistawebcrawler etc.

UNIT IV:

Archie - Veronica - Telnet - Chat - What is meant by Website, Homepage..etc.

UNIT V

HTML Programming : HTML - Basic Tags - Various versions of HTML - HTML forms -HTML frames - Browser (IE, Netscape communicator, Lynx(Text)) -Browser dependent -HTML tags.

REFERENCE BOOKS:

1. Kogent Learning Solutions Inc., “Html 5 In Simple Steps”, Dream Tech Press, 2010
2. Advanced Internet for Dummies by John Levine and Margaret Levine.
3. Asian Publishers Internet Concepts, problems and Solutions by Singh.

**Course Title: Internet of Things and
Wireless Sensor Networks**

No. of Credits:4

Course Code : 18CSEAE01

No. of Teaching Hours:T-30 P-30

Course Objectives

To impart knowledge to make the students

1. To understand the concepts of micro controller
2. To apply IoT Applications for specific domains
3. To understand the Programming Fundamentals with C using Arduino

UNIT I

Introduction and definition to IOT - What is an IOT? - Explore the scenario for application of IOT Communication definitions Concepts - Capturing and Storing the data - What to do with the data...applying Expert Systems and Machine Learning; IOT Detailed understanding of Solution Architecture - IOT Device Architecture - IOT Network/Communication Architecture with an understanding on client server and looselycouple storage servers and message queues - IOT Application Architecture.

UNIT II

Programming Fundamentals with C using Arduino IDE - Understanding the Arduino IDE - Installing and Setting up the Arduino IDE - Connecting the Arduino IDE with devices - Program Structure in C - Basic Syntax - Data Types / Variables / Constants - Operators, Conditional Statements and Loops -Functions , Array and Pointers - Strings and I/O -Using Arduino C Library functions for Serial, delay and other invoking functions - Working with LED and Switch example on Arduino C Library functions –

UNIT III

Working with Arduino for data acquisition with IOT Devices - Understanding Sensors and Devices - Understanding basic electronic components and power elements - Understanding the Inputs from Sensors - Working with Temperature Sensors -Working with Ultrasound Sensor - Working with humidity sensor - Working with Motion Sensor - Working with IR Sensor - Working with Proximity Sensor - Working with Photo Diode - Working with Accelerometer and vibration sensor - Measuring Voltage and Current–

UNIT IV

Working with Arduino for data acquisition with IOT Devices - Understanding the Outputs - Activating LED Lights - Activating Relays - Activating Buzzer - Running DC Motors - Running - Stepper Motors and Servo Motors

UNIT V

Programming Fundamentals with Web Applications for handling Data Communication from IOT Device - Understanding the data capture through web services - Creating and Programming a rest

web service with ASP.NET / PHP - Calling and accessing the Web Service in a Client; Building and Using Communication Devices to data transfer from IOT Devices - Understanding the Communication Principles to Transfer the data from IOT Devices; Remote Communication to cloud/external application - Using WIFI to Transfer the data from IOT Sensor.

REFERENCES

1. Michael Margolis, "Arduino Cookbook" 2nd Edition, O'Reilly Media, 2011
2. Michael Collier, Robin Shahan, "Fundamentals of Azure", Microsoft Press, 2015, ISBN: 978-0-7356-9722-5
3. Rick Rainey, "Azure Web Apps for Developers", Microsoft Press, 2015, ISBN: 978-1-5093-0059-4
4. Microsoft Azure, "Introduction to Microsoft Azure Storage", <https://docs.microsoft.com/en-us/azure/storage/common/storage-introduction>

Course Outcomes

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

CO1	To understand the basics of mental ability, logical ability through active involvement	Understand
CO2	To understand analytical reasoning and apply in software applications	Understand
CO3	To development of programming and database management skills	Apply
CO4	To improve Presentation Skills, Controlling Nervousness and Stage Fright, Communication via Group Discussions	Apply
CO5	To practice technical programming, cracking code, simple logic and concepts	Remember/ Analyze

Course Prepared by : Dr. R. Rajeswari

Course Verified by : Dr. T. Devi

Course Title : Grid and Cloud Computing

No. of Credits: 4

Course Code :18CSEAE03

No. of Teaching Hours: T-60, P-0

Course Objectives

To impart knowledge to make the students

1. To understand the Grid and Cloud Systems Design, architecture, data and resource management.

UNIT I

Introduction to Parallel and Distributed Computing - Cluster Computing - Grid Computing- Cloud Computing - Anatomy and Physiology of Grid- Web and Grid Services - Grid Standards - OGSAWSRF - Resource sharing - Trends, Challenges and Applications.

UNIT II

Open Grid Services Architecture (OGSA)-OGSI-OGSA use cases: Commercial data center (CDC), National Fusion collaboratory (NFS), Online media and entertainment – OGSA platform components - OGSA basic services - Policy Architecture- Security Architecture

UNIT III

Resource management on the Grid - Grid resource management systems- Work management-Layers of Grid computing. Globus GT3 Toolkit: GT3 Software Architecture model- Resource allocation- Resource management and Data management services.

UNIT IV

Cloud Architecture and Model: Technologies for Network-Based System – System Models for Distributed and Cloud Computing. Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand – Security in cloud.

UNIT V

Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim.

REFERENCE BOOKS

1. Joshy Joseph, Craig Fellenstein, “Grid Computing”, IBM Press, Pearson Education, Indian Reprint, 2009.
2. Ian Foster, Carl Kesselman, “The Grid 2: Blueprint for a New Computing Infrastructure”, Morgan Kaufmann Publishers (Elsevier), II Edition, 2004.
3. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
4. RajkumarBuyya, Christian Vecchiola, S.ThamaraiSelvi, „Mastering Cloud Computing”, Tata McGraw Hill Publishers, 2013.

Course Title : Data Analysis and Business Intelligence

No. of Credits:4

Course Code :18CSEAE04

No. of Teaching Hours:T-60, P-0

Course Objectives

To impart knowledge to make the students

1. To understand the Data Analytic concepts, tools and analysis of data using the tools.

UNIT I

Data warehousing: Introduction – Definition – Multidimensional data model – OLAP operations – Warehouse schema – Data warehousing architecture – Warehouse server – Meta data – OLAP Engine – Data warehouse backend process – Cloud data warehousing - Other features

UNIT II

Data analytics: Statistical data analysis – Fact based decision making using statistical data analysis – Descriptive model – Predictive model - Analyze and predict results based on historical patterns-Apply statistical methods to economic data, problems and trends

UNIT III

Statistics for Data Engineers: Mean, Median, Variance, Standard Deviation –Regression-Correlation Test: Chi square, Spearman Rank correlation, Pearson correlation coefficient – Parametric Test: period sample t-test, Two Independent t-test, One sample t-test – Non Parametric Test: The wilcoxon rank sum text and mannwhileny test, wilcoxon signed-ranked test

UNIT IV

Business Intelligence: Introduction – Need for BI – Related Areas - Data Preprocessing – Visualization - Variable reduction, Principle components, Course of Dimensionality – Business Intelligence model - Design Business Intelligence model and conducting the analysis

UNIT V

Tools for BI: (Any one tool in depth) Tools Overview – Tools: Cognos, Business Object, Intelligent Miner, Siebel, BI Tool, Oracle Miner, SAS.

REFERENCES

1. The Data Warehouse ETL Toolkit: Practical Techniques for Extracting, Cleaning, Ralph Kimball, Joe Casertra
2. Successful Business Intelligence: Secrets to Making BI a Killer App , By CindiHowson
3. “Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner” by GalitShmueli, Nitin R. Patel and Peter C., Bruce, Wiley, 2007.
3. Data Analytics: The Time Is Now! , By RajendraChaudhary.

4. Discovering Statistics using SAS, Andy Field & Jeremy
5. ReemaThareja, "Data Warehousing", Oxford University Press.

Course Outcomes

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

CO1	To explain the nature, source and uses of data	Understand
CO2	To analyze the correlation between various parameters of a data set using suitable techniques through statistical study	Analyze
CO3	To apply statistical learning using various regression techniques in analytics	Apply
CO4	To apply supervised learning techniques for data analytics	Apply
CO5	To apply Unsupervised learning techniques for data analytics	Apply
CO6	To identify suitable technique for various stages of data analytics	Analyze

Course Prepared by : Dr. S. Gavaskar

Course Verified by : Dr. T. Devi

Course Title : Image Processing

No. of Credits: 4

Course Code :18CSEAE08

No. of Teaching Hours: T-30, P-30

Course Objectives

To impart knowledge to make the students

- 1.To understand the Image processing.
- 2.To understand the image enhancement, image filtering and restoration

UNIT I

Introduction: Fundamental Steps in Image processing – Elements – Digital Image Fundamentals – Image representation – Modeling – Image enhancement – Image restoration – Image analysis – Image reconstruction from projections – Image data compression – Two-Dimensional Systems and Mathematical Preliminaries: Notation and definitions – Discrete and Fast Fourier Transform

UNIT II

Image Enhancement: Point operations – Enhancement by point processing – Histogram modeling – Spatial operations – Enhancement in Frequency Domain – Transform operations – Multispectral Image Enhancement – Color Image Enhancement

UNIT III

Image Filtering and Restoration: Degradation model – Diagonalization of circulant and block circulant matrices - Algebraic approach to restoration – Inverse and Wiener filtering – Finite impulse response Wiener filters – Other Fourier Transform Filters – Smoothing splines and Interpolation – Least square filters – Recursive and semirecursive filtering – Maximum entropy restoration – Bayesian methods – Coordinate transformation and Geometric correction – Blind deconvolution – Extrapolation of band-limited signals

UNIT IV

Image Data compression: Fundamentals – Image compression models – Elements of information theory – Pixel coding – Predictive techniques – Transform coding theory – Transform coding of images – Hybrid coding and vector DPCM – Inter frame coding – Image coding in the presence of channel errors – Coding of two tone images – color and multi-spectral Image coding – Lossless and lossy compressions - standards

UNIT V

Image Segmentation – Representation and Description – Recognition – Interpretation – Image analysis and Computer vision – Image reconstruction from Projections – Artificial Neural networks for color classification - Realization for real time processing – Three-dimensional Filters

REFERENCE BOOKS

1. Anil K. Jain, “Fundamentals of Digital Image Processing”, Second Edition, Prentice-Hall of India Private Limited, New Delhi, 1995.
2. Rafael C. Gonzalez and Richard E. Woods, “Digital Image Processing”, Addison-Wesley Publishing Company, Newyark, Third edition, 2008.
3. Maher A. Sid-Ahmed, “Image Processing – Theory, Algorithms and Architectures”, McGraw Hill, Inc, Newyark, 1995.
4. Moeslund Thomas B, “Introduction to Video and Image Processing”, Springer, 2012.

Course Title : Soft Computing
Course Code : 18CSEAE09

No. of Credits: 4
No. of Teaching Hours: T-60, P-0

Course Objectives:

On completion of this course, student will be able to:

- Understand and apply evolutionary concepts.
- Design neural network models.
- Use fuzzy logic.
- Apply soft computing frameworks to problem solving.

UNIT I

Introduction to Soft computing - Evolution of Computing - Soft Computing Elements – From Conventional AI to Computational Intelligence - Machine Learning – Optimization and search techniques - Multi-Objective optimization problems - Principles of Multi-objective optimization – Pareto-optimality - Pareto Front and Non-dominated Solutions.

UNIT II

Introduction to evolutionary computing - Genetic Algorithms - Evolutionary Strategies – Representations – Recombination - Binary Strings - Real-Valued Vectors - Various Selection Strategies. Search Operators - Crossover and Mutation – Fitness function - Generational cycles – Stopping criteria and constraints - Advances in Genetic Algorithms

UNIT III

Evolution of neural networks- basic models – Fundamentals of Artificial neural networks - Architecture – Learning Paradigms – Taxonomy -Activation functions - Machine Learning Using neural network, Adaptive networks – Supervised Learning and unsupervised learning networks – Advances in neural networks.

UNIT IV

Fuzzy logic - Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions -Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making - Adaptive Neuro-Fuzzy Inference Systems.

UNIT V

Biologically inspired optimization techniques - Ant Colony Optimization - Pheromone mediated search - Search space - Exploration and Exploitation, Particle swarm optimization - PSO strategies and variants - Neighborhood topologies – Applications of Soft Computing - Real world Optimization problems.

Reference Books

1. David E Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Pearson Education India, 2013.
2. S. Rajasekaran, G. A.VijayalakshmiPai, "Neural Networks, Fuzzy Logic and Evolutionary Algorithms: Synthesis & Applications", Prentice-Hall of India Pvt. Ltd., II edition, 2017.
3. S.N.Sivanandam and S.N.Deepa, "Principles of Soft Computing", Wiley India Pvt Ltd, 2011.
4. Marco Dorigo, Thomas Stutzle, "Ant Colony Optimization", MIT Press, 2010.

Course Title : Progressive Web Application Development

No. of Credits: 4

Course Code :18CSEAE16

No. of Teaching Hours: T-30, P-30

UNIT I

PWA and Angular 2 -What is a Progressive Web App (PWA)? - Features of Progressive Web App (PWA) - Different PWA Platforms; What is Angular 2 - Angular 2 Architecture - Angular 2 features; Install Node.js server - Install Git hub - Install Typescript - Install Angular 2 - Install Angular CLI; Working with Angular CLI features - Creating an Angular Project - Creating component - Creating a module - Creating a service - Creating pipes - Creating directive - Creating Enum

UNIT II

Components-What is a Component made of? - Working with the component HTML and Style Sheet - Working with component type script code - Understanding typescript basics - Adding the component to the module; Understanding and working with flex layout - Installing the Flex Layout - Building and working with different Layouts; Install and implement Angular Material components - Adding a Material UI component to angular component - Working with Angular Material UI Elements - Working with Material icons

UNIT III

Events -How are events implemented in angular code? - Understanding component life cycle events - Responding to common component UI events; Understanding the structure of the component class - Defining the properties and variables - Understanding Data binding - Defining the methods - Defining and understanding @Input - Defining and understating the @Output

UNIT IV

Understanding Directives - Working with ngIf - Working with ngFor - Understanding Pipes - Implementing a simple pipe for a date substitution - Creating custom Pipes; Understanding Navigation in Angular 2 - How is router enabled? - Understanding the base routing? - Working with router outlet - Understanding router events; What is MVC/ Web API? - How to create an MVC application with Microsoft Visual Studio? - How to create an entity to show json output? - Creating and running the MVC Service

UNIT V

Understanding HTTP Service - Understanding and Working with Dependency Injection - Calling an MVC Service with HTTP Service - Handling Json Data from MVC and binding the data; How is code reusability ensured in Angular 2? - Building custom services - Building module to integrate component - Building components into parents to facilitate interaction; How to build custom service? - How to add the service to a module? - Calling a service inside a component; Understanding web hosting? - Understanding angular build environment - How to build the production code? - Deployment of the production code to web site

REFERENCES

1. Jake Spurlock, 'Bootstrap', O'Reilly Media, 2013
2. Alex Pop, 'Learning AngularJS for .NET Developers', Packt Publishing Ltd., 2014.
3. Rajesh Gunasundaram, 'Learning Angular 4 for .NET Developers', Packt Publishing Ltd., 2017
4. www.pluralsight.com

Course Title : Python programming

No. of Credits:4

Course Code :18CSEAE17

No. of Teaching Hours: T-30 P-30

Course Objectives

To impart knowledge to make the students

1. To understand the Python programming techniques

UNIT I

Data Types and Data Structures: Introduction to Python: - using the Python interpreter, Overview of programming in Python, Python built-in types, Arithmetic in Python, Program input and Program output, Variables and assignment. Strings and string operations, List basics, List operations, Dictionaries, Dictionary basics and Tuples

UNIT II

Control Structures: Control Statements: -if statements, while statement, for statements, functions, formal arguments, variable-length arguments, Exceptions, detecting and handling exceptions.

UNIT III

Classes, files and modules: Introduction to Classes and Objects: -classes, class attributes, instances, instance attributes, binding and method invocation, inheritance, polymorphism, Built-in functions for classes and instances.

UNIT IV

Files and input/output, reading and writing files, methods of file objects, using standard library functions, dates and times

UNIT V

Database and web programming - Python database application programmer's interface (DB-API), connection and cursor objects, Type objects and constructors, python database adapters. Creating simple web clients, introduction to CGI, CGI module, building CGI applications, python web application frameworks: Django.

REFERENCES

1. Core Python Programming by Wesley J. Chun, 2nd Edition , Pearson Education
2. An Introduction to Python by Guido Van Russom, Fred L.Drake, Network Theory Limited.
3. Beginning Python: From Novice To Professional By Magnus Lie Hetland, Second Edition.
4. Programming in Python 3 by Mark Summerfield, Pearson Education
5. Online version of An Introduction To Python
6. <http://www.network-theory.co.uk/docs/pytut>
7. <http://docs.python.org/tutorial/>
8. www.spoken-tutorial.org

Course Outcomes

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

CO1	To understand the concepts of object-oriented programming as used in Python: classes, subclasses, in-heritance, and overriding.	Understand
CO2	To adequately use standard programming constructs: repetition, selection, functions, composition, modules, aggregated data (arrays, lists, etc.)	Understand
CO3	To use library software for (e.g.) building a graphical user interface, web application, or mathematical software	Apply
CO4	To identify and repair coding errors in a program	Apply
CO5	To write desktop and web applications with Python	Apply

Course Prepared by : Dr. T. Devi

Course Verified by : Dr. T. Devi

Course Title : .NET Programming

No. of Credits: 4

Course Code :18CSEAE18

No. of Teaching Hours:T-30, P-30

Course Objectives

1. To understand the .Net Framework components, Object oriented concepts
2. To develop Database Application using ADO .NET Frameworks and Design Applications to process data using Files. Apply LINQ in VB.NET and C# Programming

UNIT I

Software Development the .NET Framework – The VB.NET Development Environment – Common Elements in Visual C# – Name spaces Modules and Namespaces – data Types – Assignments and Operators – Types: Classes– Class Members– Member Functions– Structures– Enumerations –Bitwise Enumeration –Equivalence versus Identity Structures and Enumeration – Control Structures – Control Flow – Error Handling: Basics

UNIT II

Arrays and Collections: – Array Elements –Multidimensional Arrays –Jagged Arrays – System. Array– System. Array Properties – params keyword – Array Conversion Collections: Array List Collection – Bit Array Collection – Hash table Collection-A standard exception model – Structuredexceptionhandling–System.Exception–RemoteException–Unhandledexception– Windows Forms: Basics – Windows Forms Controls: Text Boxes, Labels, Buttons, Checkboxes, Radio Buttons, List Boxes, Combo Boxes Files – Picture Box – Scroll Bars

UNIT III

Object Oriented Programming in .NET Programming (VB.NET /C#) — Using - Class Fundamentals: Fields, Methods, Properties, Contractors, Events, Shared Members – Inheritance: Basics, Overriding, Sealed and Virtual Classes – Interfaces – Delegates – Attributes - – Threading: Fundamentals, Thread Synchronization – Components and Assemblies – Reflection

UNIT IV

Data Access with ADO.NET using VB.NET – Binding controls to database- Handling Database in Code-XML and ADO.NET – Reporting Crystal Reports – Creation – Binding with Data – Parameter Passing – Files and Directories: Directory and File Classes, Path Class – Streams: Stream class, stream operations, stream readers and writers, reading and writing text files, reading and writing xml files

UNIT V

Entity Framework –Architecture – Model View Framework – Architecture LINQ. Introduction to LINQ: C# Extension-LINQ Essentials–LINQ to Objects–Examples of LINQ to Object as– LINQ Operators. Queue Collection–Stack Collection– Specialized Collections - NETRemoting.

REFERENCES

1. Donis Marshall, "Programming Visual C# 2008: The Language ", Microsoft Press Publication, 2008
2. Jason Price, Mike Gunderloy, "Mastering Visual C# .Net ", John Wiley & Sons Publication,
3. Christian Nagel, Bill Evjen, Morgan Skinner, Jay Glynn, Karli Watson, „Professional C# 2012 and .NET 4.5 ,, Wiley India, 2012.
4. The Complete Reference – Visual Basic .NET, JeffreyR.Shapiro, Tata McGraw-Hill, 2002
5. Visual Basic .Net Programming Black Book, StevemHolzner, Dreamtech Press, Reprint 2011
6. Programming Microsoft Visual Basic .NET, Francesco Balena , Microsoft press 2003
7. www.spoken-tutorial.org

Course Outcomes

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

CO1	To understand .NET Framework Components and basic programming structures	Understand
CO2	To understand Object oriented Concepts, Event Handling, Delegates	Remember
CO3	To design applications using Object Oriented concepts in VB.NET and C#	Apply
CO4	To describe Thread creation, Multi-threading and synchronization, File handling operations and	Analyze
CO5	To create Database ADO .NET components/ Files in designing applications for specific problems	Apply
CO6	To evaluate the usage of LINQ features and .NET remoting in application designing	Evaluate
CO7	To design and Develop Applications for real time societal problems using .NET Framework	Evaluate

Course Prepared by : Dr. V. Bhuvaneshwari

Course Verified by : Dr. T. Devi