

Government College of Engineering, Karad

(An Autonomous Institute of Government of Maharashtra)

Academic Unit

GUIDELINES FOR CURRICULUM UNDER AUTONOMY

Following guidelines shall be strictly followed while designing the curriculum under Autonomy.

- Contact hours and credits for each semester

Semester	Contact Hours	Credits
I & II	60(30+30)	50(25+25)
III & IV	60(30+30)	50(25+25)
V & VI	60(30+30)	40(25+15)
Total Credits		140(75+65)

1 credit for Lecture/ Tutorial hour and 1 credit for 2 Practical hours per week.

- Theory & practical should be separated and made as Theory course & laboratory or Lab course separately.
- There will be max. 5 theory courses and max. 5 Laboratory courses per semester. Total courses (passing heads) in a semester should not be more than 10.
- Number of practical batches for each class should be as under-

Class	No. of Practical batches
1 st Year Class	2
2 nd and 3 rd Year Class	2

- Laboratory courses (excluding seminar & other presentations) should essentially be in laboratory where performance is conducted. Exceptionally demonstration may also be considered for laboratory course. For theoretical subjects, such performance can be evaluated through assignments and quiz.
- Heads are requested not to keep laboratory courses for which laboratory is not available and the department is not likely to purchase required equipment in next three years. That can be considered only after procurement of equipment and establishment of laboratory. Same strategy should be applied for the list of experiments to be included in the syllabus in a particular laboratory.
- ESE for laboratory courses (excluding seminars & projects) should be kept only when performance based practical examination is possible. Under the circumstances, students should essentially be assessed based only on his practical performance during the examination.
- In view of AICTE guidelines, observations in different reports by NKC, NASSCOM, NSDM, FICCI etc., the curriculum shall consist of courses like Professional Practises (I Communication skills, II Soft skills, III Aptitude skills), industrial training, Mini Project, Minor Project, Project, Electives, self-study etc. In view of giving industry exposure, more thrust shall be given on expert lectures from industry, industrial visits, industry problem based/ sponsored projects, real life problem based mini projects etc.
- All laboratory courses including seminar & projects (excluding mini project) shall be assessed continuously based on continuous evaluation formats.
- At least one industrial visit in one of the appropriate laboratory courses in each of III, IV, V semester; it should be mentioned in the details of that course. It is mandatory; however, the department shall encourage more visits, if possible, in many courses at any level. The visit report should be included in the list of experiments and should be a part of journal/ term work to be submitted by students. Due weightage shall be given in CE & ESE of that lab course.

- The credits and the level at which few common courses shall be offered are given below:

Course	Semester/ Level	Contact Hours	Credits	Remarks
Soft Skills	II	2(T)+2(P)	3	
Business Communication	IV	2(T)+2(P)	3	
Professional Communication	V	3(L)	3	
Industrial Training/ Mini Project (Batch size 2 students)	During vacation After SY and credits in V	--	2	Mini project essentially based on industry or real life problem
Minor Project (Project Planning and Management Lab)	IV	5	3	At the most 2 students can do one minor project (Batch of 10 students per faculty)
Seminar	II	2	2	
Elective-I	IV	3	3	
Project Phase-I	V	6	4	At the most 5 students can do one major project (2 project batches per faculty)
Project Phase-II	VI	30	15	
Elective-II & III	V	6	6	

- The curriculum structure should essentially contain list of electives in concerned semester. The list though contain at least three courses, should not be too exhaustive.
 - The curriculum structure & syllabus should be in the formats only.
 - In order to enhance the self-learning ability of the student, the self-study modules needs to be separately specified in the contents of the syllabus for the subject. The student's ability to express his/her own thoughts will be tested by asking questions on self-study modules in ESE
 - Text books, reference books, websites etc should be correctly mentioned with latest version. The Heads are requested to verify it personally on Internet at the time of mentioning in the curriculum.
 - The courses for UG and PG need to be formulated with its Course Objectives, course outcomes, assessment rubrics, mapping of course objectives with programme outcomes etc.
- In the structure all theory courses should appear first followed by laboratory courses

Government College of Engineering, Karad

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MCA Second year Curriculum Structure Semester – III

Sr. No.	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits	EXAM SCHEME				
								CT1	CT2	TA/CA	ESE	TOTAL
1	MC301	Operating System	3	1	-	4	4	15	15	10	60	100
2	MC302	Computer Networks	3	-	-	3	3	15	15	10	60	100
3	MC303	Enterprise Resource Planning	3	2	-	5	5	15	15	10	60	100
4	MC304	Object Oriented Modeling and Design	3	-	-	3	3	15	15	10	60	100
5	MC305	Software Testing	3	-	-	3	3	15	15	10	60	100
6	MC306	Computer Networks Lab	-	-	2	2	1	-	-	50	-	50
7	MC307	Object Oriented Modeling and Design Lab	-	-	2	2	1	-	-	50	-	50
8	MC308	Software Testing Lab	-	-	2	2	1	-	-	25	25	50
9	MC309	Advanced Java Programming Lab	-	2	4	6	4	-	-	50	50	100
		Total	15	5	10	30	25	75	75	225	375	750

L- Lecture T-Tutorial P-Practical

CT1- Class Test 1 TA/CA- Teacher Assessment for theory courses / Continuous Assessment for lab courses

CT2- Class Test 2 ESE- End Semester Examination (For Laboratory End Semester performance)

Credits Distribution:

Course Category	HS (Hum. And So. Sci)	BS (Basic Sc.)	ES (Eng. Sc.)	PC (Programme Core)	PE (Programme Electives)	OE (Open Elective)	MC (Mandatory Course)
Credits	0	0	0	44	0	0	0
Cumulative Sum	6	0	0	69	0	0	0

Government College of Engineering, Karad
(An Autonomous Institute of Government of Maharashtra)
MCA Second year
Curriculum Structure
Semester – IV

Sr. No.	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits	EXAM SCHEME				
								CT1	CT2	TA/CA	ESE	TOTAL
1	MC401	Information Security	3	-	-	3	3	15	15	10	60	100
2	MC402	Advanced Database System	3	-	-	3	3	15	15	10	60	100
3	MC4*3	Elective-I	3	-	-	3	3	15	15	10	60	100
4	MC404	E-Governance	3	-		3	3	15	15	10	60	100
5	MC409	Computer Algorithm	3	-	-	3	3	15	15	10	60	100
6	MC405	Web Technology Lab	-	1	2	3	2	-	-	25	25	50
7	MC406	Scripting Language Lab	-	1	2	3	2	-	-	25	25	50
8	MC407	Project Planning and Management Lab	-	1	4	5	3	-	-	50	50	100
9	MC408	Business Communication	-	2	2	4	3	-	-	50	-	50
		Total	15	5	10	30	25	75	75	200	400	750

L- Lecture T-Tutorial P-Practical

CT1- Class Test 1

TA/CA- Teacher Assessment for theory courses / Continuous Assessment for lab courses

CT2- Class Test 2

ESE- End Semester Examination (For Laboratory End Semester performance)

Elective-I

1. Digital Forensics
2. Embedded Systems
3. Distributed Systems

Credits Distribution:

Course Category	HS (Hum. And So. Sci)	BS (Basic Sc.)	ES (Eng. Sc.)	PC (Programme Core)	PE (Programme Electives)	OE (Open Elective)	MC (Mandatory Course)
Credits	6	0	0	16	3	0	0
Cumulative Sum	12	0	0	85	3	0	0

Government College of Engineering Karad

Second Year M.C.A.

MC301: Operating System

Teaching Scheme	Examination Scheme	
Lectures : 3 Hrs/week	CT1	15
Tutorials: 1 Hr/week	CT2	15
Total Credits: 4	TA	10
	ESE	60

Course Objectives:

- 1 Comprehensive introduction to understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in operating systems.
- 2 In particular, the course will consider inherent functionality and processing of program execution.
- 3 The emphasis of the course will be placed on understanding how the various elements that underlie operating system interact and provides services for execution of application software.

Course Contents

		Hours
Unit I	What is Operating System, Operating system structures: Process Management: Process Concept, Process scheduling, operations on processes, Cooperating processes, interprocess communication, threads overview.	5
Unit II	CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm evaluation. Process Synchronization: The critical –Section problem, synchronization hardware, and semaphore, classic problems of synchronization, critical regions.	5
Unit III	Deadlock: System Model, Deadlock Characterization, Resource-Allocation Graph, Methods for Handling Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection. Memory Management: Concept, Memory Management Techniques, Swapping, Contiguous Memory Allocation, Memory Protection, Memory Allocation, Fragmentation, Paging, Basic Method, Segmentation with Paging, Virtual Memory Concept, Demand Paging, Page Replacement.	5
Unit IV	File System: File System Implementation, Allocation Methods, Free Space Management, Efficiency and Performance.	5

Unit V I/O Systems and Mass Storage: I/O Hardware, Polling, Interrupts, DMA, Disk Structure, Disk scheduling, FCFS Scheduling, SSTF Scheduling, Selection of Disk Scheduling Algorithm, Disk Management 5

Course Outcomes (CO):

- 1 Student should aware of understanding of design issues associated with operating systems.
- 2 Student should aware of concepts of memory management including virtual memory.
- 3 Be familiar with various types of operating systems including Unix.

Text Books:

- 1 Operating Systems: Concepts: By Abraham Siberschatz, Peter Galvin-Wiley-Sixth edition.
- 2 Operating Systems: Seventh Edition by William Stallings, Pearson Publications.

References:

- 1 Operating Systems: Andrew S. Tanenbaum-Pearson Education- Second Edition.
- 2 System Programming and Operating Systems by D.M. Dhamdhare-TMH – Second Edition.
- 3 Operating Systems: Internals and Design Principles, Seventh Edition by William Stallings, Pearson Publications

Useful Links:

- 1 <http://nptel.ac.in/syllabus/syllabus.php?subjectId=106102132>, Prof. Sorav Bansal, IIT Delhi
- 2 <http://nptel.ac.in/courses/106108101/>, Prof. P.C.P. Bhatt, IISc Bangalore
- 3 www.ocw.mit.edu

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√				√			√	√	√
CO2		√			√		√		√	
CO3	√				√	√	√	√		√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering Karad

Second Year M.C.A.

MC302: Computer Networks

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives

- 1 To demonstrate knowledge of basic principles of computer networking.
- 2 To make students familiar with the detailed functionality of the layered network architecture.
- 3 To enable students develop Internet applications and their protocols.
- 4 To develop student's own applications such as Client Server applications, Web Services etc.

Course Contents

		Hours
Unit I	Introduction: Computer Network: Overview of Computer Network, Network hardware and software, Reference model- OSI and TCP/IP and their comparison Network layer-network layer design issues, various routing Algorithms and congestion control algorithms, Networking layer in the internet.	8
Unit II	Transport layer: The transport services, elements of transport protocols, internet transport protocols, ATM – AAL layer protocols, Performance issues.	8
Unit III	TCP/IP: TCP/IP architecture, the internet protocols, IPv4 , IPv6, DHCP and Mobile IP , internet routing protocols , multicast routing ,The network layer in ATM networks	8
Unit IV	The Application layer: Network security – principle of cryptography, secret key and public key algorithm, digital scanners, Domain name system-The DNS name space, resource records, name server, simple network management Protocol –SNMP model, Electronic mail- architecture and services, Message formats and message transfer, email privacy Usenet news- user view of Usenet and Usenet implementation	8
Unit V	Multimedia Information and Networking: Lossless data compression, Video on Demand, Transmission in ATM network, Communication satellites. Additional issues related to security	8

Course Outcomes (CO):

- 1 Students will come to know about various protocols, models in Networks
- 2 Students will be aware of Network hardware, Media Types (cables , Wireless)
- 3 Students will be able to design, implement and analyze simple computer networks.
- 4 Students will know the different strategies of operations of TCP/UDP, FTP, HTTP, SMTP, SNMP

Text Books:

- 1 Andrew. S. Tanenbaum, “Computer Networks”, PHI
- 2 Alberto,Leon –Garcia and Indra widjaja, “Communication Networks- Fundamental concepts and key architectures”, Tata Mc-Graw Hill

References:

- 1 Behrouz A. Forouzan “Data Communications and Networking ”, Tata Mc Graw Hill
- 2 Achyut Godbole, “Data Communications and Networks”, Tata Mc Graw Hill
- 3 Craig Zacker, “Complete Reference Networking”, Tata Mc Graw Hill

Useful Links:

<http://www.nptel.ac.in>

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√				√	√
CO2		√	√		√		√	√		√
CO3	√		√	√	√	√	√	√	√	√
CO4	√	√		√		√	√		√	

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering Karad

Second Year M.C.A.

MC303: Enterprise Resource Planning

Teaching Scheme	Examination Scheme
Lectures 3 Hrs/week	CT1 15
Tutorials 2 Hrs/week	CT2 15
Total Credits: 5	TA 10
	ESE 60

Course Objectives:

- 1 Analyse business enterprise activities and workflow.
- 2 Develop plans for web portals and management.
- 3 Offer enterprise level IT Based solutions.

Course Contents

	Hours
Unit I Curtain Raiser: An overview, Accommodating variety, Integrated Management Information, Seamless Integration, Supply Chain Management, Resource Management, Integrated data model, Scope, Technology, Benefits of FRP, Evolution, ERP revised, ERP & Modern Enterprise, problems.	6
Unit II Business Engineering & ERP: An overview, what is Business Engineering (BE)? Significance of BE, Principles of BE, BPR, ERP & IT, BE with IT, ERP and Management concerns, problems.	8
Unit III Business Modeling for ERP & Implementation: An overview, Building the Business Model, problems. An overview, Role of consultants, vendors & users, customization, precautions, ERP: Post-implementation options, ERP implementation methodology, Guidelines for ERP implementation, problems.	9
Unit IV ERP domain and the Competitive Advantage: An overview, ERP & competitive strategy, problems. MFG/PRO, OFS/Avalon – Industrial & Financial Systems, Baan IV, SAP, SAP R/3 Applications, Examples of as Indian ERP package, The arrival of ERP III, problems.	9
Unit V Case Studies: An overview, Mercedes-Benz, Kee Hin Industries, Bull Electronics Angers Plant Manufactures, Ameritech, Essar Steel, Jindal Iron & Steel Company Ltd, Godrej Soaps ans associates companies, Indian Renewable Energy Development Agency (IREDA), ERP Handles Pressure, Sara ERP case study – Hawkins Cookers Ltd, A wholesome enterprise application, Sara IEMS (ERP III) case study – Pan Century, Oleochemicals, Malaysia.	8

Course Outcomes (CO):

- 1 To get knowledge of enterprise activities and work flow
- 2 To study different web portals.
- 3 To get knowledge of enterprise level IT based solutions.

Text Books:

- 1 Enterprise Resource Planning – Concepts & Practice (Second Edition) By V. K.Garg & N.K. Venkitakishnan
- 2 Enterprise Resource Planning by Alexis Leon.

References:

- 1 ERPWARE – E R P Implementation Framework By V. K. Garg & N. K. Venkitakishnan.
- 2 Enterprise Resource Planning by Mahadev Jaiswal, Ganesh Vanupalli.

Useful Links:

<http://www.nptel.ac.in>,
www.ocw.mit.edu

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1		√		√	√	√	√	√		
CO2	√	√	√	√	√	√	√		√	
CO3	√	√			√	√	√			√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering, Karad

Second Year M.C.A.

MC304: Object Oriented Modelling and Design

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/Week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives:

- 1 Understanding the issues involved in implementation an Object Oriented Design
- 2 Analyze requirements and produce initial design
- 3 Develop the design to the point where it is ready for implementation
- 4 Design Components to maximize their reuse.

Course Contents

	Hours
Unit I Introduction: What is Object Orientation? What is Object Oriented Development? Object Oriented Themes? Evidence for Usefulness of Object Oriented Development, Modeling Concepts: Modeling, Abstraction, The Three Models.	4
Unit II Class Modeling: Object and Class Concepts, Link and Association Concepts, Generalization and Inheritance, A Sample Class Diagram, Navigation of Class Models, Advanced Object and Class Concepts, N-ary Associations, Aggregation, Abstract Classes, Multiple Inheritance, Metadata, Constraints, Derived Data, Packages.	8
Unit III State Modeling: Events, States, Transitions and Conditions, State Diagrams, State Diagram Behaviour, Nested States Diagrams, Nested States, A Sample State Models, A Relation of Class and State Models.	8
Unit IV Interaction Modeling: Use Case Models, Sequence Models, Activity Models, Use Case Relationship, Procedural Sequence Models. Architectural Modeling: Component Diagram, Deployment Diagram	8
Unit V Analysis: Process Overview: Development Stages, Development Life Cycle System Conception: Devising a System Concept, Elaborating a Concept, Preparing a Problem Statement. Domain Analysis: Overview of Analysis	8

Unit VI Design:

6

System Design: Overview of System Design, Estimating Performance, Making a Reuse Plan, Breaking a System into Sub-System, Design Pattern

Implementation:

Implementation Modeling: Overview of Implementation.

Course Outcomes (CO):

- 1 Understand the principles of Object Oriented Design
- 2 Apply UML in Object Oriented Software Development
- 3 Ability to work in teams to perform the Object Oriented Techniques

Text Books:

- 1 Object Oriented Modeling and Design with UML by Michael Blaha, James Rumbaugh, PHI 2nd Edition
- 2 Object Oriented Analysis and Design with Applications - Grady Booch, Pearson Education Asia 3rd Edition

References:

- 1 Object Oriented Analysis and Design with Applications by Addison Wesley, Third Edition
- 2 The Unified Modeling Language User Guide by Booch, Rumbaugh, Jacobson, Second Edition, Pearson
- 3 Object-Oriented Software Engineering : Using UML Patterns, and Java by Bernd Bruegge, Allen H. Dutoit, Third Edition, Prentice Hall

Useful Links:

<http://nptel.ac.in/courses/122105022/27> NPTEL OOMD, IIT Kharagpur, Prof. Vishbajit Mohanty
http://www.tutorialspoint.com/object_oriented_analysis_design/OOMD
 Tutorial Point

Mapping of CO with PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√							√	√	√
CO2	√	√			√		√		√	
CO3	√	√		√	√	√	√	√		√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	-	-	-	-
Understand	4	4	2	20
Apply	5	5	3	25
Analyze	4	4	3	10
Evaluate	2	2	2	05
Total	15	15	10	60

Government College of Engineering Karad
Second Year M.C.A.

MC305: Software Testing

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives:

- 1 To demonstrate knowledge of basic principles of software testing.
- 2 To make students familiar with the test case design methods.
- 3 To enable students develop test cases for manual as well as automation testing.
- 4 To make students familiar with metrics and measurement.

Course Contents

	Hours
Unit I Introduction: Testing as an Engineering Activity – Role of Process in Software Quality – Testing as a Process – Basic Definitions – Software Testing Principles – The Tester’s Role in a Software Development Organization – Origins of Defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository	8
Unit II Test Case Design: Introduction to Testing Design Strategies – The Smarter Tester – Test Case Design Strategies – Using Black Box Approach to Test Case Design Random Testing –Requirements based testing – positive and negative testing — Boundary Value Analysis – decision tables - Equivalence Class Partitioning state-based testing– cause effect graphing – error guessing - compatibility testing – user documentation testing – domain testing Using White–Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White–box Based Test Design –code complexity testing – Evaluating Test Adequacy Criteria.	8
Unit III Levels of testing: The Need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests. The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – scenario testing –defect bash elimination - System Testing – types of system testing - Acceptance testing –performance testing - Regression Testing – internationalization testing – ad-hoc testing -	8

Alpha – Beta Tests – testing OO systems – usability and accessibility testing

Unit IV Test management: 8

People and organizational issues in testing – organization structures for testing teams – testing services - Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process - Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

Unit V Controlling and Monitoring: 8

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation - Test metrics and measurements – project, progress and productivity metrics – Status Meetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types of reviews – Developing a review program – Components of Review Plans– Reporting Review Results. – evaluating software quality – defect prevention – testing maturity model

Course Outcomes (CO):

- 1 Students will be able to demonstrate knowledge of basic principles of software testing.
- 2 Students will be familiar with the test case design methods.
- 3 Students will be able to develop test cases for manual as well as automation testing.

Text Books:

- 1 Iene Burnstein “Practical Software Testing” Springer International Edition Chennai, 2003
- 2 Srinivasan Desikan and Gopaldaswamy Ramesh, “ Software Testing – Principles and Practices”, Pearson education, 2006
- 3 Aditya P. Mathur, “Foundations of Software Testing”, Pearson Education, 2008

References:

- 1 Boris Beizer, “Software Testing Techniques”, Second Edition, Dreamtech, 2000 UNIT III
- 2 Elfriede Dustin, “Effective Software Testing”, First Edition, Pearson Education, 2000 UNIT III
- 3 Renu Rajani, Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004

Useful Links:

<http://www.softwaretestingmentor.com/istqb-videos/> Software Testing by Manish Varma
<http://nptel.ac.in/courses/106101061/18> Software Testing by Prof. Rushikesh Joshi

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√	√		√		√
CO2		√			√		√		√	√
CO3	√	√	√			√			√	

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	05	05		10
Understand	05	05	02	10
Apply	05	05	03	20
Analyze				
Evaluate			02	20
Create			03	
Total	15	15	10	60

Government College of Engineering Karad

Second Year M.C.A.

MC306: Computer Network Lab

Laboratory Scheme		Examination Scheme	
Practical	2 Hrs/week	CA	50
Total Credits	1		

Course Objectives:

- 1 To learn fundamental concepts of computer networks
- 2 To demonstrate topologies, devices, transmission medias in network
- 3 To use different network commands, software to analyze the network
- 4 To make aware about Network simulator for simulation of network effectively.

Course Contents

- Experiment 1** Study of different types of cables.
- Experiment 2** Network devices in details
- Experiment 3** Study of Network address.
- Experiment 4** Connect the computers in Peer to Peer and Client - Server architecture
- Experiment 5** To Share Printer and Folder in Network.
- Experiment 6** Study of Network Commands
- Experiment 7** Configure a Network Topology using packet tracer software
- Experiment 8** Install Wireshark software to capture packet and Configure it to capture Ethernet packet. Verify Ethernet frame structure.
- Experiment 9** To familiarize with the network packet sniffer, ethereal. Analyzing HTTP request and response messages. Locating methods like GET, HEAD, POST etc.
- Experiment 10** Study of Network simulator (NS) and Simulation of Congestion Control Algorithms using NS
- Experiment 11** Applications using TCP and UDP Sockets like DNS, SNMP, File Transfer
- Experiment 12** To visit server room and prepare report on
1. Proxy Server
 2. Server Configuration
 3. Router Configuration
 4. Firewall Configuration
 5. Network setup details (Topology, Back up, IP range, network software, UPS)

Government College of Engineering, Karad
Second Year M.C.A.
MC307: Object Oriented Modelling and
Design Lab

Laboratory Scheme

Practical 2 Hrs/Week

Total Credits 1

Examination Scheme

CA 50

Course Objectives:

- 1 Understanding the use of Object oriented techniques.
- 2 Analyze requirements and produce initial design
- 3 Understanding the prerequisites for software development.

Course Contents

Students should solve the case studies by using analysis and design with using uml.

- Experiment 1 Define the problem of case study
- Experiment 2 Draw the class diagram for case study
- Experiment 3 Draw the object diagram for case study
- Experiment 4 Draw the state diagram for the case study
- Experiment 5 Draw the use case diagram for the case study
- Experiment 6 Draw the sequence diagram for the case study
- Experiment 7 Draw the activity diagram for the case study
- Experiment 8 Draw the component diagram for the case study
- Experiment 9 Draw the deployment diagram for the case study
- Experiment 10 Draw the system architecture for the case study

Course Outcomes (CO):

- 1 Understand the Object Oriented Design and Modeling
- 2 Apply UML techniques in Project Development
- 3 Ability to work in teams to perform the Object Oriented Techniques

Mapping of CO with PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√							√	√	
CO2	√	√			√		√		√	
CO3	√	√		√	√	√	√	√		√

Government College of Engineering Karad

Second Year M.C.A.

MC308: Software Testing Lab

Laboratory Scheme		Examination Scheme	
Practical	2 Hrs/week	CA	25
Total Credits	1	ESE	25

Course Objectives:

- 1 To demonstrate knowledge of basic concepts of software testing.
- 2 To enable students develop test cases for manual as well as automation testing.
- 3 To make students familiar with test case management tools, automation testing software.

Course Contents

Experiment 1

Identify test cases using manual testing

- Experiment 2** Estimate & write test cases for random input triangle problem.
- Experiment 3** Construct equivalence classes and generate test cases for standard input problems.
- Experiment 4** Apply black box testing (Equivalence Class Partitioning & Boundary Value Analysis) for given problem
- Experiment 5** Demonstrate SaaS Test Management tool : Testuff
- Experiment 6** Demonstrate Selenium: An Automation Functional Testing Tool
- Experiment 7** Apply White Box Testing for given source code.
- Experiment 8** Identify test cases for the following applications using Imacro
- Experiment 9** Write the program for quick sorting & debug (analyse) it using eclipse debugger view
- Experiment 10** Identify test cases for the following applications using Load Impact
- Experiment 11** Identify test cases for the following application using LoadUI Web

List of Submission

- 1 Minimum 10 experiments to be performed and evaluated Journal

Course Outcomes (CO):

- 1 Students will be able to demonstrate knowledge of basic concepts of software testing.
- 2 Students will be able to develop test cases for manual as well as automation testing.
- 3 Students will be able to use test case management tools, automation testing software.

Useful Links:

<http://www.softwaretestingmentor.com/istqb-videos/> Software Testing by Manish Varma

<http://nptel.ac.in/courses/106101061/18> Software Testing by Prof. Rushikesh Joshi

Government College of Engineering Karad

Second Year M.C.A.

MC309: Advance Java Programming Lab

Laboratory Scheme		Examination Scheme	
Practical	4 Hrs/week	CA	50
Tutorial	2	ESE	50
Total Credits	4		

Course Objectives:

- 1 Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing etc.
- 2 Design and develop Web applications.
- 3 Designing applications using pre-built frameworks.

Sample List of Experiments:

- Experiment 1 Program to Class and Method.
- Experiment 2 Program to Packages & Interfaces.
- Experiment 3 Program using JDBC demonstrating the use of prepared statement.
- Experiment 4 Develop a program demonstrating the use of generic servlet class.
- Experiment 5 Develop a program demonstrating the use of HTTP Servlet class.
- Experiment 6 Develop a program demonstrating the use of cookies management.
- Experiment 7 Develop a dynamic webpage demonstrating the use of JSP.
- Experiment 8 Write applet to draw human face.
- Experiment 9 Program to create an extended AWT component.
- Experiment 10 Develop a program to demonstrate the communication between client and server using socket programming.
- Experiment 11 Develop a program demonstrating the use of Swing.
- Experiment 12 Develop a program demonstrating the use of Struts.
- Experiment 13 Develop a program demonstrating the use of Java Beans

Tutorial:

A set of Tutorial/ problems based on above syllabus is to be submitted

List of Submission:

- 1 Total number of Experiments : 13

Government College of Engineering Karad

Second Year M.C.A.

MC401: Information Security

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives

- 1 Recount the history of computer security and how it evolved into information security
- 2 Define key terms and critical concepts of information security
- 3 Enumerate the phases of the security systems development life cycle
- 4 Describe the information security roles of professionals within an organization

Course Contents

	Hours
Unit I Information Security: Introduction, History of Information security, What is Security, CNSS Security Model, Components of Information System, Balancing Information Security and Access, Approaches to Information Security Implementation, The Security Systems Development Life Cycle.	6
Unit II Cryptography: Concepts and Techniques, symmetric and asymmetric key cryptography, steganography, Symmetric key Ciphers: DES structure, DES Analysis, Security of DES, variants of DES, Block cipher modes of operation , AES structure, Analysis of AES , Key distribution Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Analysis of RSA, Diffie-Hellman Key exchange	10
Unit III Message Authentication and Hash Functions: Authentication requirements and functions, MAC and Hash Functions, MAC Algorithms: Secure Hash Algorithm, Whirlpool, HMAC, Digital signatures, X.509, Kerberos	8
Unit IV Security at layers(Network, Transport, Application): IPSec, Secure Socket Layer(SSL), Transport Layer Security(TLS), Secure Electronic Transaction(SET), Pretty Good Privacy(PGP), S/MIME	8
Unit V Intruders, Virus and Firewalls: Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls	8

Course Outcomes (CO):

- 1 Upon completion of this material, students should be able to define information security
- 2 Students will be able to recount the history of computer security and how it evolved into information security
- 3 Students will be able to define key terms and critical concepts of information security
- 4 Students will be able to enumerate the phases of the security systems development life cycle
- 5 Students will be able to describe the information security roles of professionals within an organization

Text Books:

- 1 Principles of Information Security : Michael E. Whitman, Herbert J. Mattord, CENGAGE Learning, 4th Edition.
- 2 Cryptography and Network Security : William Stallings, Pearson Education, 4th Edition
- 3 Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 2nd Edition

References:

- 1 Network Security and Cryptography: Bernard Menezes, CENGAGE Learning
- 2 Cryptography and Network Security : C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
- 3 Introduction to Network Security: Neal Krawetz, CENGAGE Learning
- 4 Principles of Computer Security: WM.Arthur Conklin, Greg White, TMH
- 5 Handbook of Security of Networks, Yang Xiao, Frank H Li, Hui Chen, World Scientific, 2011.
- 6 Cryptography and Network Security : Atul Kahate, Mc Graw Hill, 2nd Edition

Useful Links:

- 1 <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-858-computer-systems-security-fall-2014/> Computer Systems Security by Prof. Nikolai Zeldovich
- 2 <http://nptel.ac.in/courses/106106129/> Information Security by Professors at IIT Madras
- 3 http://vlab.co.in/ba_labs_all.php?id=2 Information Security Virtual Labs by Professors at IIIT Hyderabad
- 4 <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-858-computer-systems-security-fall-2014/> Computer Systems Security by Prof. Nikolai Zeldovich

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√	√		√		√
CO2		√			√		√		√	√
CO3	√	√	√	√		√			√	
CO4	√		√		√			√		
CO5	√	√	√	√	√	√	√	√		√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering Karad
Second Year M.C.A.

MC402: Advanced Database System

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives:

- 1 Understand basic database concepts, including the structure and operation of the relational data model.
- 2 Construct simple and moderately advanced database queries using Structured Query Language (SQL).
- 3 Understand and successfully apply logical database design principles, including E-R diagrams and database normalization
- 4 Describe and discuss selected advanced database topics, such as a distributed database systems and the data warehouse.
- 5 Understand the role of the database administrator.

Course Contents

		Hours
Unit I	Query Processing: Measures of Query Cost, Selection Operation, Sorting, Join Operation, Evaluation of Expressions.	6
Unit II	Query Optimization: Transformation of Relational Expressions, Estimating Statistics of Expression Results, Choice of Evaluation Plans, Advanced Topics in Query Optimization.	10
Unit III	Database-System Architectures: Centralized and Client –Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems, Network Types.	8
Unit IV	Parallel Databases: I/O Parallelism, Interquery Parallelism, Intraquery Parallelism, Intraoperation Parallelism, Interoperation Parallelism, Query Optimization, Design of Parallel Systems.	8
Unit V	Distributed Databases: Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions, Commit Protocols, Concurrency Control in Distributed Databases, Availability, Distributed Query Processing, Heterogeneous Distributed Databases.	8

Course Outcomes (CO):

- 1 Evaluate and Apply Advanced Database Development Techniques.
- 2 Evaluate Database Systems.
- 3 Administer Database Systems
- 4 Design & Implement Advanced Database Systems.

Text Books:

- 1 Database system concepts', 5th Edition –Abraham Silberschatz, Henry Korth, S, Sudarshan, (McGraw Hill International).
- 2 Database Management Systems - Raghu Ramkrishnan, Johannes Gehrke Second Edition, (McGraw Hill International)

References:

- 1 Fundamentals of Database Systems - Ramez Elmasri , Shamkant Navathe
- 2 Data Mining: Concepts and systems - Jiawei nan, Micheline Kamber, (Morgan Kaufmann publishers

Useful Links:

- 1 <http://nptel.ac.in/courses/106106093/>, Database Design, Dr. S. Srinath, IIT Madras
- 2 www.ocw.mit.edu

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√		√		√	√
CO2		√		√		√		√	√	√
CO3	√	√	√		√			√		
CO4	√			√		√	√		√	√

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	05	05		10
Understand	05	05	02	10
Apply	05	05	03	20
Analyze				
Evaluate			02	20
Create			03	
Total	15	15	10	60

Government College of Engineering Karad

Second Year M.C.A.

MC413: Elective-I Digital Forensics

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives:

- 1 To get knowledge of fundamental concepts of Digital Forensics (DF)
- 2 To understand types, Evidence Collection, Duplication and Preservation in DF
- 3 To study Current Computer Forensic tools

Course Contents

	Hours
Unit I Computer Forensics Fundamentals: What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement - Computer Forensic Technology - Types of Business Computer Forensic Technology Computer Forensics Evidence and Capture: Data Recovery Defined -Data Back-up and Recovery-The Role of Back-up in Data Recovery - The Data- Recovery Solution	6
Unit II Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options obstacles-- Types of Evidence - The Rules of Evidence-Volatile Evidence - General Procedure - Collection and Archiving -Methods of Collection - Artifacts - Collection Steps- Controlling Contamination: The Chain of Custody Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene - Computer Evidence Processing Steps - Legal Aspects of Collecting and Preserving Computer Forensic Evidence Computer Image Verification and Authentication: Special Needs of Evidential Authentication - Practical Consideration -Practical Implementation	10

- Unit III Computer Forensics analysis and validation: 8**
Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions
Network Forensics: Network forensics over view, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honey net project.
Processing Crime and Incident Scenes:
Identifying digital evidence. collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case
- Unit IV Current Computer Forensic tools: 8**
Evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software
E-Mail Investigations: Exploring the role of e-mailing investigation, exploring the roles of the client and server in email, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools
Cell phone and mobile device forensics:
Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.
- Unit V Working with Windows and DOS Systems: 8**
Understanding file systems, exploring Microsoft File Structures. Examining NTFS disks. Understanding whole disk encryption, windows registry. Microsoft startup tasks. MS-DOS startup tasks, virtual machines.

Course Outcomes (CO):

- 1 Students will be able to get knowledge of fundamental concepts of Digital Forensics (DF)**
- 2 Students will be able to understand types, Evidence Collection, Duplication and Preservation in DF**
- 3 Students will be able to study Current Computer Forensic tools**

Text Books:

- 1 Gregory Kipper, “Wireless Crime and Forensic Investigation”, Auerbach Publications, 2007**
- 2 Iosif I. Androulidakis, “ Mobile phone security and forensics: A practical approach”, Springer publications, 2012**

References:

- 1 Andrew Hoog, “ Android Forensics: Investigation, Analysis and Mobile Security for Google Android”, Elsevier publications, 2011**
- 2 Angus M.Marshall, “ Digital forensics: Digital evidence in criminal investigation”, John – Wiley and Sons, 2008**

Useful Links:

<https://www.youtube.com/watch?v=-d5xSZeLepI> Computer Forensics by
Jeremy Martin

<https://www.youtube.com/watch?v=AyJCSUGzLws> Computer
Forensics by O'Reilly - Video Training

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√	√		√		√
CO2		√	√		√		√		√	√
CO3	√	√	√	√		√			√	

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering Karad

Second Year M.C.A.

MC423: Elective-I Embedded Systems

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives:

- 1 To demonstrate knowledge of basic principles of Embedded Systems.
- 2 To make students familiar with the Memory, Processes, IO.
- 3 To enable students for circuit designing.

Course Contents

		Hours
Unit I	Embedded Computing: Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.	8
Unit II	Memory and Input / Output Management: Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.	8
Unit III	Processes and Operating Systems: Multiple tasks and processes – Context switching – Scheduling policies – Inter process communication mechanisms – Performance issues.	8
Unit IV	Embedded Software: Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools–Emulators and debuggers.	8
Unit V	Embedded System Development: Design issues and techniques – Case studies – Complete design of example embedded systems.	8

Course Outcomes (CO):

- 1 Students will be able to demonstrate knowledge of basic principles of Embedded Systems.
- 2 Students will be able to inculcate knowledge of Memory, Processes, and IO.
- 3 Students will be able to design circuits.

Text Books:

- 1 Wayne Wolf, “Computers as Components: Principles of Embedded Computer System Design”, Elsevier, 2006.
- 2 Michael J. Pont, “Embedded C”, Pearson Education, 2007.

References:

- 1 Steve Heath, “Embedded System Design”, Elsevier, 2005
- 2 Muhammed Ali Mazidi, Janice Gillispie Mazidi and Rolin D. McKinlay, “The 8051 Microcontroller and Embedded Systems”, Pearson Education, Second edition, 2007

Useful Links:

- 1 <http://nptel.ac.in/courses/108102045/> Embedded Systems by Dr. Santanu Chaudhury
- 2 <http://www.embedded.com/electrical-engineer-community/general/4402976/VIDEO--MIT-lectures-on-Computer-Science-Programming> Embedded Systems by Bernard Cole
- 3 <http://nptel.ac.in/courses/108102045/> Embedded Systems by Dr. Santanu Chaudhury

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√	√		√		√
CO2			√		√		√		√	√
CO3		√	√			√				

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering Karad

Second Year M.C.A.

MC433: Elective-I Distributed Systems

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives:

- 1 To understand basic concepts of Distributed Systems.
- 2 To learn process, synchronization, security in Distributed Systems.
- 3 To apply knowledge of Distributed Systems in cluster formation or any other Distributed Systems.

Course Contents

		Hours
Unit I	Introduction: Definition, goals, types of distributed system, architecture, architectural styles, system architectures, Client-server model and examples of distributed system.	8
Unit II	Processes, communication & Synchronization: Threads, virtualization, clients, servers, remote procedure calls, distributed shared memory	8
Unit III	Synchronization: clock synchronization, logical clock, mutual exclusion	8
Unit IV	Consistency And Replication: Introduction, Data Centric Consistency Model, Client Centric Consistency Model, Replica Management, Consistency Protocol Fault Tolerance: Introduction, Process Resilience, Reliable Client Server Communication, Reliable Group Communication, Distributed Commit, Recovery	8
Unit V	Security: Introduction, Secure Channels, Access Control, Security Management	8

Course Outcomes (CO)

- 1 Students will be able to understand basic concepts of Distributed Systems.
- 2 Students will be able to learn process, synchronization, security in Distributed Systems.
- 3 Students will be able to apply knowledge of Distributed Systems in cluster formation or any other Distributed Systems.

Text Books:

- 1 Distributed system - A S Tanenbaum (2nd edition) (chapter 1 and 2).
- 2 Wayne Wolf, “Computers as Components: Principles of Embedded Computer System Design”, Elsevier, 2006.
- 3 Michael J. Pont, “Embedded C”, Pearson Education, 2007.

References:

- 1 Distributed operating systems - Dr. P. K. Sinha (PHI)
- 2 Distributed system , concepts and design ,4th edition - Coulouirs, Dollimore, Kindberg (Addison Wesley)

Useful Links

- 1 <http://video.mit.edu/watch/lecture-20-distributed-systems-1845/>
Distributed Systems by Saman Amarasinghe
- 2 <http://www.nptel.ac.in/courses/106106107/> Distributed Systems by Prof. Ananthnarayana V.S.

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√	√		√		√
CO2		√	√		√		√		√	√
CO3	√	√	√	√		√			√	

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering, Karad

Second Year M.C.A.

MC404 E-Governance

Teaching Scheme		Examination Scheme	
Lectures	3 Hrs/Week	CT1	15
Total Credits	3	CT2	15
		TA	10
		ESE	60

Course Objectives:

- 1 Explains basic concepts of e-government.
- 2 Good practice approaches, tools and techniques widely used for managing e-Government.
- 3 The technical implementation, management, and security of e-government.

Course Contents

		Hours
Unit I	Introduction to e-Government: Definitions, Domains, Taxonomy, Current Status in India and Global, Conceptual Foundations, Citizen Centric E-Governance, E-Governance Services, E-Governance Models.	6
Unit II	Managing E-Governance-Strategy and Implementation: Management Models-Centralised, Decentralised, Hybrid, Implementation Models- Back End Automation, Front End Services, Holistic, Business Models- Self Finance, PPP, JV, Different Payment, Facilities Management outsourcing, Management of Intellectual Properties	8
Unit III	Theories of Evolution in e-Government: Four stages of e-Government evolution, Various models, e-Government maturity model.	4
Unit IV	Managing e-Government: Transformational Government for value creation, Theory and practice of BPRs, Change Management, Capacity Building, Role of Political Leadership, Role of Social Media and Citizens, Technology- Components and Overview, Procurement Strategy and Challenges.	8
Unit V	E-Government Life Cycle: Different between general and e-Government Project Life Cycle, Concept behind and importance of each PLC stage. Challenges in Implementation of e-Government Project: Universally identified challenges, Challenges facing e-Government practitioners in India.	8

Unit VI Performance Management: 8

India and Global Assessment framework and variety of e-readiness indexes and their usefulness Outcomes and Benefits management.

Case Studies:

Global and Indian Case studies of Successful and Unsuccessful Projects. Cloud computing for e-governance.

Course Outcomes (CO):

- 1 Understand the basic functioning of e-government**
- 2 Apply the technical and management skills in implementing e-governance projects.**
- 3 Analyse and evaluate assessment framework of e-government projects.**

Text Books:

- 1 E-Government: From vision to implementation. Subhash Bhatnagar, Sage Publications India Pvt. Ltd.**
- 2 E-Government- Concepts and case studies, C S R Prabhu**

References:

- 1 Unlocking E-Governance Potential Concepts Cases and Practical Insights, Subhash Bhatnagar, Sage Publications India Pvt. Ltd.**
- 2 Compendium of E-Governance Initiatives in India, Piyush Gupta, R. K. Bagga, University Press India.**
- 3 E-Governance Case Studies, Ashok Agarwal, University Press India**
- 4 Information Technology and E-Governance, N. Gopalsamy, New Age International Publications.**

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√		√	√	√	√		√		√
CO2		√	√		√		√		√	√
CO3	√	√	√	√		√			√	

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering, Karad
Second Year M.C.A.
MC409: Computer Algorithm

Teaching Scheme

Lectures 3 Hrs/week

Tutorial 2 Hrs/week

Total Credits: 5

Examination Scheme

CT1 15

CT2 15

TA 10

ESE 60

Duration of ESE 2 Hrs 30

Min

Course Objectives:

1To learn Algorithm specifications, performance analysis

2To learn Dynamic programming

3To learn Basic traversal and search techniques:

Course Contents

	Hours
Unit I Introduction: Algorithm specifications, performance analysis, randomize algorithm, Data structures like stack, queue, graph, tree.	6
Unit II Divide and conquer: general method, binary search, finding maximum and minimum, merge sort, quick sort, STRASSEN's matrix multiplication, convex hull.	6
Unit III The greedy method: KNAPSACK problem, tree vertex splitting, job sequencing with dead lines, optimal merge pattern, single source shortest paths.	7
Unit IV Dynamic programming: Multistage graphs, All pairs shortest path, optimal binary search trees, string edition, 0/1 KNAPSACK, reliability design, traveling salesman problem.	7
Unit V Basic traversal and search techniques: Techniques for binary trees, Breadth first, depth first search, connected components and spanning trees, bi connected components and Depth First Search (DFS), Breadth First Search (BFS).	7
Unit VI Back Tracking and Branch and bound: The 8 Queen's problem, sum of subsets, Graph coloring, KNAPSACK problem. The method, 0/1 KNAPSACK problem, Traveling salesman problem, Efficiency considerations.	7
Tutorial Ten tutorials to be submitted based on the above syllabus.	

Course Outcomes (CO):

1Students will be able to understand the Algorithm specifications, performance analysis

2Students will be able to design the different Algorithms

3Students will be able to use the different Algorithms in programming techniques.

Text Books:

- 1 Fundamentals of computer algorithm by Horowitz and Sahni, Galgotia
 2 Design and analysis of algorithm by Aho and Ullman, Addison Wesley and company 6
 2008.

References:

- 1 Data Structures and Algorithms by Alfred V. Aho, Jeffrey Ullman-Pearson Education Asia-
 Seventh Indian reprints 2002.
 2 Algorithms in Nutshell by George Heineman, Gary Pollice-SPD-Oct 2008.

Useful Links:

<http://www.nptel.ac.in>,
www.ocw.mit.edu

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1		ç		ç	ç	ç	ç	ç		
CO2	ç	ç	ç	ç	ç	ç	ç		ç	
CO3	ç	ç			ç	ç	ç			ç

Assessment Pattern

Knowledge Level	CT1	CT2	TA	ESE
Remember	5	5	-	10
Understand	5	5	2	10
Apply	5	5	3	20
Analyze	-	-	-	-
Evaluate	-	-	2	20
Create	-	-	3	-
Total	15	15	10	60

Government College of Engineering Karad

Second Year M.C.A.

MC405: Web Technology Lab

Laboratory Scheme		Examination Scheme	
Practical	2 Hrs/week	TA	25
Tutorial	1 Hrs/week	ESE	50
Total Credits	2		

Course Objectives:

- 1 To give Students a Hands-on Experience on HTML, CSS and Other Web technologies.
- 2 To give Students a Hands-on Experience on Advanced Web Concepts.

Course Contents

	Hours
Unit I Introduction to web, HTML5 CSS and Graphics: Introduction to web, basic concepts- www, mark up languages, scripting languages etc., HTML 5 tags: traditional HTML tags, video- add/control video with JavaScript, canvas- basic shapes and animation, audio, Geolocation etc. CSS text, font, margins, links, lists, transforms, transitions, borders, background, shadows, opacity, padding, display, dimensions, positions, outline, tables.	6
Unit II Introduction to JavaScript, Variables, Operators & Expressions: A limited featured programming language, Object name, Property, Methods, The dot syntax, The main event, values & variables, Parts of an expression, Multiple operations, Types of operators. If statement, switch...case statement, Loop statements: for, while, do...while, continue, What is a function?, Definition of a function, The scope of variables & arguments, Calling a function, Functions calling another function, Returning values from a function. .	6
Unit III Arrays & Strings: What is an array, declaring an array, Defining array elements, Looping the array, adding an array element, Sorting array elements, making a new array from existing array, Combining array elements into a string, Changing elements of the array, Why manipulate a string ?, Joining Strings, Dividing text, Converting numbers & strings, Changing case of the string, Strings & Unicode.	7
Unit IV Forms, Event Handling & Cookies: Building blocks of a form, Responding to form events, Form objects & elements, Changing attribute values, labels & option list dynamically, Evaluating check box selection, Manipulating elements before the form, Disabling elements, Read-only elements, Cookie basics, creating a cookie, reading a cookie, setting a expiration date,	7

deleting a cookie.

Unit V JavaScript and Frames: **6**
Frame basics, Calling a child window's JavaScript function, Changing the content of a child window, Changing the focus of a child window, Writing to a child window from a JavaScript, Accessing Elements of another child window.

Tutorial:

A set of Tutorial/ problems based on above syllabus is to be submitted

Sample List of Experiments:

- Experiment 1** Overview of internet technology
- Experiment 2** Short note on Html and its various tags.
- Experiment 3** Brief description of attribute of different tags.
- Experiment 4** Image Tag and links.
- Experiment 5** Creating a table.
- Experiment 6** Creating a Frame.
- Experiment 7** Creating a Form.
- Experiment 8** CSS (Cascading style sheet).
- Experiment 9** Introduction to java script.
- Experiment 10** Functions of java script

List of Submission:

- 1** Total number of Experiments: 10

Course Outcomes (CO):

- 1** Students will able to understand the requirement of customers.
- 2** Students will remember the technology and apply it.
- 3** After completion of these suggestive experiments students will get hands-on experience on developing a web site.

Text Books:

- 1** JavaScript Demystified By Jim Keogh
- 2** Web Technologies: Black Book, Kogent Learning Solutions Inc..

References:

- 1** JavaScript 2.0-The Complete Reference, Second Edition by Thomas Powell and Fritz chneider
- 2** JavaScript: The Good Parts by Douglas Crockford

Government College of Engineering Karad

Second Year M.C.A.

MC406: Scripting Language Lab

Laboratory Scheme		Examination Scheme	
Practical	2 Hrs/week	CA	25
Tutorial	1	ESE	50
Total Credits	2		

Course Objectives:

- 1 Design and develop scripts using javascript, JQuery.
- 2 Design and develop Web applications using sever side scripting language PHP.
- 3 Design and develop scripts using Phython, VBScripts.

Sample List of Experiments:

- Experiment1 Introduction to Various Scripting Langauges.
- Experiment 2 Progam to a JavaScript program to display information box as soon as page loads.
- Experiment 3 Create a form, put validation checks on values entered by the user using JavaScript (such as age should be a value between 1 and 150, Mandatory fields, Input Numbers only).
- Experiment 4 Highlight table row record on hover with jQuery.
- Experiment 5 Event Handling using Jquery.
- Experiment 6 To create a text box and submit button of event handling submit form () using AJAX.
- Experiment 7 Develop a dynamic webpage demonstrating the use of AJAX and APIs.
- Experiment 8 Program to PHP Enumerated Arrays, PHP Associative Arrays, Array Iteration, PHP Multi-Dimensional Arrays, Array Functions.
- Experiment 9 String Handling in PHP.
- Experiment 10 Program to PHP Form handling, PHP GET, PHP POST, PHP Form Validation, PHP Form Sanitization. Hotel management system
- Experiment 11 Develop a program demonstrating the use of Variables, strings, and Numbers in Python
- Experiment 12 Use Python to demonstrate Input-Output, Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files.
- Experiment 13 Using Conditional Statements in VBScript

Experiment 14 Using Procedures & Functions in VBScript

Experiment 15 Develop a Webpage demonstrating the use of PHP and MySQL (Database Connectivity in PHP).

Tutorial:

A set of Tutorial/ problems based on above syllabus is to be submitted

List of Submission:

1 Total number of Experiments : 12

Course Outcomes(CO):

- 1 Implement Concept of JDBC.**
- 2 Implement advanced java concepts servlet, JSP, AWT, applet, socket programming, Swing, struts**
- 3 Implement concept and use of Java beans and Struts frameworks development**

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√	√	√	√	√	√	√	√	√	√
CO2							√		√	√
CO3		√	√	√	√	√			√	

Government College of Engineering, Karad

Second Year M.C.A.

MC407: Project Planning and Management Lab

Laboratory Scheme		Examination Scheme	
Practical	4 Hrs/Week	CA	50
Tutorial	1	ESE	50
Total Credits	3		

Course Objectives:

- 1 Students will have will have good knowledge of the issues and challenges faced while doing the Software project Management.
- 2 Students will be able to understand why majority of the software projects fails and how that failure probability can be reduced effectively.
- 3 Students will be able to do the Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.

Course Contents

The project batches of 2-3 students should be formed, which will work on the project allocated by the department. The batch must complete it during first semester only. Term work submission should be done in the form of a joint report. The term work assessment will be done jointly by teachers appointed by Head of the Institution. The oral examination will be conducted by an internal and external examiner as appointed by the University.

- 1 Project work should be continually evaluated based on the contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
- 2 Two mid-term evaluations should be done, which includes presentations and demos of the work done.

Tutorial:

A set of tutorial based on above syllabus is to be submitted.

Course Outcomes (CO):

- 1 Students will demonstrate knowledge of the distinction between critical and non-critical systems.
- 2 Students will demonstrate the ability to manage a project including planning, scheduling and risk assessment/management.
- 3 Students will demonstrate proficiency in rapid software development techniques.
- 4 Students will be able to identify specific components of a software design that can be targeted for reuse.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1		√		√	√		√	√		√
CO2	√	√	√		√	√	√	√	√	
CO3	√	√	√	√		√		√	√	√
CO4	√	√		√	√	√	√		√	√

Government College of Engineering Karad

First Year M.C.A.

MC408: Business Communication

Laboratory Scheme

Tutorial 2 Hrs/week

Practical 2 Hrs/week

Total Credits 3

Examination Scheme

CA 50

Course Objectives:

- 1 To identify latent talents and sharpen them into effective tools for success in career.
- 2 To apply practical knowledge for self-development focusing upon various skill sets as per industry requirement.
- 3 To live up to the popular saying "the first impression is the last impression", the focus is on building a pleasing personality leading to positive branding of oneself.
- 4 To keep oneself abreast with the social & professional etiquette by working on power dressing, elegant presentation & one's brand management.

Course Contents

		Hours
Unit I	Self-Awareness: Personality Assessment, Competency Mapping, Self-Concept.	6
Unit II	Communication Skills: Interpersonal Behavioural Styles, Assertive Communication	6
Unit III	Self-management: Response Able Behaviour, Beginning with End in Mind	6
Unit IV	Image Management: Presentation Skills, Grooming and Etiquette	6
Unit V	Aptitude: Percentages, Profit and loss, Time and work, Time and distance, Problems on trains, Puzzle test, Directions, Blood relations, Coding and Decoding	21
Unit VI	Language: Special Package for Acquiring Competency in English (SPACE)	15

Sr. No.	Domain	Theme	Oral Outcome	Written Outcome
1	Letter Writing	Material Possession	Conversation & Description	Letter Writing & News Report

Course Outcomes (CO):

After completing this course students will be able

- 1 To produce various genres of discourses such as conversations, descriptions, narratives, reports, essays, letters, biographical sketches, news reports, etc. both orally and in writing.**
- 2 To participate in debates, discussions, seminars and speak effectively, fluently and forcefully**
- 3 To read critically different genres of written English**
- 4 To understand the differences between positive and negative attitude**
- 5 To learn scientific methods of developing positive attitude towards self & others**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	√	√	√	√	√					
CO2		√	√	√	√	√				
CO3			√	√		√	√	√		
CO4	√	√	√	√	√	√	√			
CO5	√		√	√	√					