

- M. Sc. in COMPUTER SCIENCE
- FOURTH SEMESTER (EVEN SEMESTER)

FACULTY OF SCIENCE

Eligibility Criteria (Qualifying Exams)	Course Code	Course Type	Course (Paper/Subjects)	Credits	Contact Hours Per WeeK			EoSE Duration (Hrs.)	
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After appearing in the Third semester examination irrespective of any number of back/ arrear papers	CMP 401	CCC	NETWORK SECURITY	5	4	2	0	3	0
	CMP 411	CCC	NETWORK SECURITY – LABORATORY WORK	2	00	00	3	00	3
	CMP402	CCC	MOBILE COMPUTING AND APPLICATION DEVELOPMENT	5	4	2	0	3	0
	CMP 412	CCC	MOBILE COMPUTING AND APPLICATION DEVELOPMENT – LABORATORY WORK	2	00	00	3	00	3
	CMP403	CCC	SYSTEM DESIGN AND SOFTWARE ENGINEERING	5	4	2	0	3	0
	CMP 413	CCC	SYSTEM DESIGN AND SOFTWARE ENGINEERING – LABORATORY WORK	2	00	00	3	00	3
	CMP 421	SSC/PRJ	DISSERTATION	12	00	00	18	00	8
	MINIMUM CREDITS IN INDIVIDUAL SUBJECT IS 6 AND IN COMPLETE SEMESTER IT WOULD BE 30				TOTAL= 33				

M.Sc. in COMPUTER SCIENCE (FOURTH SEMESTER)	
COURSE CODE: CMP 401	COURSE TYPE : CCC
COURSE TITLE: NETWORK SECURITY	
CREDIT: 07	HOURS: 135
THEORY: 05 PRACTICAL: 02	THEORY: 90 PRACTICAL: 45
MARKS: 100	
THEORY: 70 CCA : 30	PRACTICAL: 33
OBJECTIVE: The main objective is to know about Cryptography,Security,SymmetricCipher,Public Key Cryptography,HashFunction,Web Security and System Security.	
UNIT-1 15Hrs	Foundations of Cryptography and security Security trends, The OSI Security architecture Security attack, services and mechanism Ciphers and secret messages, Mathematical tools for cryptography: substitution techniques, modular arithmetic, Euclid's algorithm, finite fields, polynomial arithmetic.
UNIT-2 20Hrs	Symmetric Cipher Symmetric cipher model, Design Principles of Block Ciphers, Theory of Block Cipher Design, Feistel cipher network structure, Data Encryption Standard (DES), Strength of DES Triple DES ,Modes of operation.Advance encryption Standard (AES)- Evaluation criteria of AES,AES cipher ,key distribution.
UNIT-3 20 Hrs	Public Key cryptography and Hash function Prime numbers and testing for primality, factoring large numbers, Principles of public key cryptosystem, RSA algorithm. Key management: Diffie-Helman Key exchange, elliptic curve arithmetic, elliptic curve cryptography, Hash and Message authentication Code (MAC), Hash and MAC algorithms, Digital signature and Authentication protocol.
UNIT-4 20 Hrs	IP and Web security protocols: Authentication application: Kerberos, Public key infrastructure .E-mail: Pretty Good Privacy (PGP), S/MIME. IP security, Web Security: Secure Socket layer (SSL) and Transport layer security,Secure Electronic Transaction (SET).
UNIT- 5 15 Hrs	System Security: Basics of System security ,Types of System Security,Firewall, Intrusion Detection system (IDS), Malicious Software , Spywares ,Hacking Concepts, Spoofing ,Phishing ,Mail Bombing, Virus and it's types, Concept of infected files and it's remedies .

**LABORATORY WORK
CMP-411**

1. Practicals based on private key based algorithms.
2. Practicals based on public key based algorithms.
3. Practicals based on cryptography.
4. Practicals based on Web Security.
5. Practicals based on Networking.
6. Practicals based on Email.
7. Practicals based on Spoofing .
8. Practicals based on Phishing.
9. Practicals based on Virus .
10. Practicals based on IP Address .

**SUGGESTED
READINGS**

1. Cryptography and Network Security By William Stallings, 4th Edition Pearson Publication
2. Applied cryptography - protocols and algorithm By Bruce Schneier, Springer Verlag 2003
3. Cryptography and Network Security By Atul Kahate , TMH Publication.
4. Cryptography and Network Security By Behrouz A. Forouzan, First Edition, TMH Publication.
5. Network Security: Private Communication in Public World By Charlie Kaufman, Radia Perlman and Mike Speciner , PHI Publication.

M.Sc. in COMPUTER SCIENCE (FOURTH SEMESTER)	
COURSE CODE: CMP 402 COURSE TYPE : CCC	
COURSE TITLE: MOBILE COMPUTING AND APPLICATION DEVELOPMENT	
CREDIT: 07	HOURS: 135
THEORY: 05 PRACTICAL: 02	THEORY: 90 PRACTICAL: 45
MARKS: 100	
THEORY: 70	CCA : 30 PRACTICAL: 33
OBJECTIVE: The use of mobile communication and android based applications are increasing day by day. It is therefore necessary for students to know that how mobile communication works and how to build mobile apps for android operating system. This course covers the necessary concepts which are required to understand mobile communication and to develop Android Applications. Thus ,it is key course for computer engineers, who want to work in the area of communication.	
UNIT-1 15Hrs	Introduction to Mobile Computing: Concept of Mobile Communication, Different generations of wireless technology ,Basics of cell, cluster and frequency reuse concept ,Noise and its effects on mobile, Understanding GSM and CDMA,Basics of GSM architecture and services like voice call, SMS, MMS, LBS, VAS ,Different modes used for Mobile Communication,Architecture of Mobile Computing(3 tier),Design considerations for mobile computing,Characteristics of Mobile Communication ,Application of Mobile Communication,Security Concern Related to Mobile Computing,Middleware and Gateway required for mobile Computing,Making Existing Application Mobile Enable,Mobile IP, Basic Mobile Computing Protocol ,Mobile Communication via Satellite • Low orbit satellite • Medium orbit satellite • Geo stationary satellite Satellite phones .
UNIT-2 15Hrs	Introduction to Android: Overview of Android ,What does Android run On – Android Internals, Android for mobile apps development,Environment setup for Android apps Development , Framework - Android- SDK, Eclipse , Emulators – What is an Emulator / Android AVD. Android Emulation – Creation and set up , First Android Application .
UNIT-3 20 Hrs	Android Activities and GUI Design Concepts: Design criteria for Android Application : Hardware Design Consideration, Design Demands For Android application, Intent, Activity, Activity Lifecycle and Manifest, Creating Application and new Activities, Simple UI -Layouts and Layout properties : Introduction to Android UI Design, Introducing Layouts , XML Introduction to GUI objects viz.: Push Button , Text / Labels , EditText, ToggleButton , Paddingetc.
UNIT-4 20 Hrs	Advanced UI Programming : Event driven Programming in Android (Text Edit, Button clicked etc.) , Activity Lifecycle of Android ,Exception Handling, Application Development using UI Programming.
UNIT- 5 20 Hrs	Toast, Menu, Dialog, List and Adapters: Menu :Basics, Custom v/s System Menus, Create and Use Handset menu Button (Hardware) , Dialog : Creating and Altering Dialogs , Toast : List & Adapters, Demo Application Development and Launching , Basic operation of SQLite Database, Android Application Priorities .

1. Installation and setup of java development kit(JDK),setup android SDK,setup eclipse IDE,setup android development tools (ADT) plugins,create android virtual device.
2. Create “Hello World” application. That will display “Hello World” in the middle of the screen using TextView Widget in the red color.
3. Create application for demonstration of android activity life cycle.
4. Create sample application with login module.(Check username and password) On successful login, ChnageTextView “Login Sucessful”. And on failing login, alert user using Toast “Login fail”.
5. Create an application for demonstration of Relative and Table Layout in android.
6. Create an application that will pass two number using TextView to the next screen , and on the next screen display sum of that number.
7. Create an application that will get the Text Entered in Edit Text and display that Text using toast (Message).
8. Create an UI such that, one screen have list of all the types of cars. On selecting of any car name, next screen should show Car details like: name, launched date, company name.
9. Create an application that will Demonstrate Dialog Box Control In Android.
10. Create Registration page to demonstration of Basic widgets available in android.

- Building Android Apps , In Easy Steps, McGraw-Hill Education.
- Professional Android 2 Application Development ,Reto Meier , Wiley India Pvt Ltd .
- Beginning Android , Mark L Murphy , Wiley India Pvt Ltd .
- . Pro Android ,Sayed Y Hashimi and SatyaKomatineni , Wiley India Pvt Ltd .

M.Sc. in COMPUTER SCIENCE (FOURTH SEMESTER)	
COURSE CODE: CMP 403 COURSE TYPE : CCC	
COURSE TITLE: SYSTEM DESIGN AND SOFTWARE ENGINEERING	
CREDIT: 07	HOURS: 135
THEORY: 05 PRACTICAL: 02	THEORY: 90 PRACTICAL: 45
MARKS: 100	
THEORY: 70	CCA : 30
PRACTICAL: 34	
OBJECTIVE: The main objective is to face the problems of Software Development. How informations are collected from sites, locations, industries etc and how remedies were developed and implemented .	
UNIT-1 15Hrs	System Concept: System, Characteristics and Elements of System, Types of System ,System Development Life Cycle: Various phases, Fact Finding process and techniques, Feasibility Study: Technical, Operational and Economic feasibilities, Cost & Benefit Analysis
UNIT-2 15Hrs	Tools of Structured Analysis: Data Dictionary, Form, Gantt Charts, System Model, Pseudo Codes, System Flow Chart, DFD, Decision Tree, Decision Tables, Input and Output Form Design Methodologies.
UNIT-3 20 Hrs	Software Engineering Fundamentals : Definition of software product, software development paradigms;software engineering and end user development approaches. Software Analysis : Software requirements specification (SRS) standards, Specification tools, flow based, data based and object orientated analysis design documentation standards.
UNIT-4 20 Hrs	Systems Design : Idealised and constrained design, process oriented design (Gane and Sarson and Yourdon notations); data oriented design, Object oriented design (Booch approach), Cohesion and coupling; Role of case tools, Re-engineering legacy systems, Coding standards.
UNIT- 5 20 Hrs	Software Quality And Testing : Software quality assurance, types of software testing (white box, black box, unit, integration, validation, system etc), debugging and reliability analysis, program complexity analysis,software quality and metrics; software maturity model and extensions. Software cost and Time estimation, introduction to the Rayleigh curve, algorithmic cost model (COCOMO). Software Project Management : Planning software projects, work background structures, integrating software, software design and project planning, software project teams, project monitoring and controls.

**LABORATORY WORK
CMP 412**

1. Software Analysis and design of Various software models.
2. Practice for Data dictionary and DFD various S/W.
3. Form Designing & coding of various S/W.
4. Testing for various coding based on their requirements.
5. Practice for Debugging and S/W Testing .
6. Practice for database connectivity with any Front End Language and Backend Database.
7. Web design practice in Web based Programming Language.
8. Website development in Web based Programming Language.
9. Various S/W models developed according to need of users.
10. Develop any complete software with Front End Language and Backend Database.

**SUGGESTED
READINGS**

1. Software Engineering: A Practitioner's Approach , pressman Roger, Tata McGraw Hill.
- 2 . An Integrated approach to Software Engineering ,JalotePankaj, Narosa: New delhi. 1991.
3. I Sommerville, " Software Engineering V edition: ", Addison Wesley, 1996.
4. Software Engineering Demystified By DeeptiBhanot, Galgotia Publications.
5. System Analysis and Design By V K JAM, DreamTech Press .
6. Modern System Analysis & Design By A Hoffer, F George, SValaciahlow .

M.Sc. in COMPUTER SCIENCE (FOURTH SEMESTER)	
COURSE CODE: CMP 421	COURSE TYPE : SSC/PRJ
COURSE TITLE: DISSERTATION	
CREDIT: 12	HOURS: 270
MARKS: 200	
OBJECTIVE: The main objective is to give Training to students for Software Development .They familiar about the latest market requirement tools for Software Development.	

Guide Lines for Development of Major Project	All the students of M.Sc.(CS) final semester are required to submit a project report based on the work done by him/her during the project period.
	All students must submit a Synopsis/Summary/Abstract separately with the project report. It should be such that the Internal Guide must aware about the software which the student wants to submit and comprise of about 10-15 pages. The content should be as brief as is sufficient enough to explain the objective and implementation of the project that the candidate is going to take up. The write up must adhere to the guidelines and should be in touch with the internal guide and the progress must be constantly updated to the Internal guide.
	Project Evaluation Guidelines. The project is evaluated on the basis of following heads : Presentation - 25% of total marks. Viva - 20% of total marks. Thesis/Project report- 30% of total marks.
	Software Coding i) Documentation - 10% of total marks. ii) SoftwareExecution- 15% of total marks.
	The following suggested guidelines must be followed in preparing the Final project Report: Good quality white executive bond paper A4 size should be used for typing and duplication. Care should be taken to avoid smudging while duplicating the copies. Page Specification : (Written paper and source code) Left margin - 3.0 cms 3 Right margin- 2.0 cms Top margin 2.54 cms Bottom margin 2.54 cms Page numbers - All text pages as well as Program source code listing should be numbered at the bottom center of the pages. Normal Body Text: Font Size: 12, Times New Roman, Double Spacing, Justified. 6 point above and below para spacing Paragraph Heading Font Size: 14, Times New Roman, Underlined, Left Aligned. 12 point above & below spacing. Chapter Heading Font Size: 20, Times New Roman, Centre Aligned, 30 point above and below spacing. Coding Font size : 10, Courier New, Normal Submission of Project Report to the University : The student will submit his/her project report in the prescribed format. The Project Report should include : 1) One copy of the summary/abstract. 2) One hard Copy of the Project Report. 3) Soft copy of project on CD/DVD in a thick envelope pasted inside of the back cover of the project report. 4) The Project Report may be about 60-90 pages (including coding)

FORMAT OF THE STUDENT PROJECT REPORT ON COMPLETION OF THE PROJECT

1. Cover Page as per format
2. Declaration
3. Certificate of the project guide
4. Certificate of the Company/Organisation
5. Certificate by Internal and External Examiner
6. Forwarding Certificate by HOD/Principal
7. Acknowledgement
8. Main Report
 - a) Objective & Scope of the Project
 - b) Theoretical Background
 - c) Definition of Problem
 - d) System Analysis & Design vis-a-vis User Requirements
 - e) System Planning
 - f) Methodology adopted, System Implementation & Details of Hardware & Software used
 - g) System Maintenance & Evaluation
 - h) Feasibility Study
 - i) Database Design details
 - k) Module Description
 - i) Detailed Life Cycle of the Project
 - a) ERD
 - b) DFD
 - j) Coding
 - k) Methodology used for testing
 - l) Test Report
 - m) Input and Output Screen Snapshots
 - m) Future Aspects
 - n) Limitations
 - o) Bibliography
 - p) References