

Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

New Scheme of Examination as per AICTE Flexible Curricula

VIII Semester

Bachelor of Technology (B.Tech.) Computer Science and Engineering/ **(w.e.f. July, 2020)**
Computer Engineering/Computer Science & Technology]

S.No.	Subject Code	Category	Subject Name	Maximum Marks Allotted					Total Marks	Contact Hours per week			Total Credits
				Theory			Practical			L	T	P	
				End Sem.	Mid Sem. Exam.	Quiz/ Assignment	End Sem	Term work					
								Lab Work & Sessional					
1.	CS 801	DC	Distributed System	70	20	10	30	20	150	2	1	2	4
2.	CS 802	DE	Departmental Elective	70	20	10	-	-	100	3	1	-	4
3.	CS 803	OE	Open Elective	70	20	10	-	-	100	3	0	0	3
4.	CS 804	D Lab	Departmental Elective Lab	-	--	-	30	20	50	-	-	6	3
5.	CS 805	P	Major Project-II	-	-	-		100	100	-	-	8	4
6.	Additional Credits [#]	[#] Additional credits can be earned through successful completion of credit based MOOC's Courses available on SWAYAM platform (MHRD) at respective UG level.											
Total				210	60	30	60	140	500	8	2	16	18

Departmental Electives	Open Electives
802(A) Digital Image Processing	803(A) Digital Marketing & SEO
802 (B) Bio Informatics	803(B) Agile Software Development
802 (C) Semantic Web & Ontologies	803(C) Quantum Computing
802 (D) Natural Language Processing	803 (D) Mobile Application Development

Open Electives can be offered to students of all branches **including CSE branch**. However, they can be offered to students of Non-CSE branches only if they have not taken any similar courses previously and have sufficient knowledge of pre-requisite courses (if any) of respective open electives subject.

1 Hr Lecture	1 Hr Tutorial	2 Hr Practical
1 Credit	1 Credit	1 Credit

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CS-801 Distributed System

Course Objectives:

1. To understand the foundations of distributed systems.
2. To learn issues related to clock Synchronization and the need for global state in distributed systems.
3. To learn distributed mutual exclusion and deadlock detection algorithms.
4. To understand the significance of agreement, fault tolerance and recovery protocols in Distributed Systems.
5. To learn the characteristics of peer-to-peer and distributed shared memory systems.

Course Outcomes:

1. Elucidate the foundations and issues of distributed systems
2. Understand the various synchronization issues and global state for distributed systems.
3. Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
4. Describe the agreement protocols and fault tolerance mechanisms in distributed systems.
5. Describe the features of peer-to-peer and distributed shared memory systems

UNIT I

Introduction to distributed systems

Architecture for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System,

UNIT-II

Distributed Share Memory & Distributed File System

Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Design & Implementations issues In DSM System, Structure of Share Memory Space, Consistency Model, and Thrashing. Desirable features of good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault tolerance. Naming: - Features, System Oriented Names, Object Locating Mechanism, Human Oriented Name.

UNIT-III

Inter Process Communication & Synchronization

API for Internet Protocol, Data Representation & Marshaling, Group Communication, Client Server Communication, RPC- Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms: Bully & Ring Algorithms.

UNIT-IV

Distributed Scheduling & Deadlock

Distributed Scheduling-Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock-Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms,

UNIT-V

Distributed Multimedia & Database system

Distributed Data Base Management System(DDBMS), Types of Distributed Database, Distributed Multimedia:- Characteristics of multimedia Data, Quality of Service Managements. Case Study of Distributed System:- Amoeba, Mach, Chorus

Recommended Books:

1. Sinha, Distributed Operating System Concept & Design, PHI
2. Coulouris & Dollimore, Distributed System Concepts and Design, Pearson Pub
3. Singhal & Shivratri, Advance Concept in Operating System, McGraw Hill
4. Attiya & Welch, Distributed Computing, Wiley Pub.

List of Experiments:

1. Implement concurrent day-time client-server application.
2. Configure following options on server socket and tests them: SO_KEEPALIVE, SO_LINGER, SO_SNDBUF, SO_RCVBUF, TCP_NODELAY
3. Simulate the functioning of Lamport's Logical Clock in C/C++.
4. Simulate the Distributed Mutual Exclusion in C/C++.
5. Implement a Distributed Chat Server using TCP Sockets in C/C++.
6. Implement Java RMI mechanism for accessing methods of remote systems.
7. Simulate Balanced Sliding Window Protocol in C.
8. Implement CORBA mechanism by using C++program at one end and Java program on the other.
9. Incrementing a counter in shared memory.
10. Monitor SOAP request and response packets. Analyze parts of it and compare them with the operations (java functions) headers.

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Departmental Electives CS-802(A) Digital Image Processing

Course objectives:

1. Describe and explain basic principles of digital image processing.
2. Design and implement algorithms that perform basic image processing (e.g. noise removal and image enhancement).
3. Design and implement algorithms for advanced image analysis (e.g. image compression, image segmentation).
4. Assess the performance of image processing algorithms and systems.

Course outcomes:

1. State the Image representation and modeling.
2. Describe the various Fourier transformation techniques.
3. Identify the various Image enhancements and filter techniques.
4. Recognize the Image encoding and segmentation techniques
5. Illustrate the various morphology operations.

UNIT I

Digital Image fundamentals, a simple image model, Sampling and Quantization. Relationship between pixels, Imaging geometry, Image acquisition systems, Different types of digital images

UNIT II

Image transformations, Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine transformation

UNIT III

Image enhancement, Filters in spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.

UNIT IV

Image encoding and segmentation, Encoding: Mapping, Quantizer, Coder, Error free compression, Lossy Compression schemes. JPEG Compression standard, Detection of discontinuation by point detection, Line detection, edge detection, Edge linking and

boundary detection, Local analysis, Global processing via Hough transforms and graph theoretic techniques

UNIT V

Mathematical morphology- Binary, Dilation, crosses, Opening and closing, simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation

Recommended Books:

1. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing Pearson.
2. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing using Matlab – TMH.
3. Sonka, Digital Image Processing & Computer Vision, Cengage Learning
4. Jayaraman, Digital Image Processing, TMH.
5. Pratt, Digital Image Processing, Wiley India

List of Experiments:

1. To create a program to display grayscale image using read and write operation.
2. To obtain histogram equalization image.
3. To Implement smoothing or averaging filter in spatial domain.
4. Program for opening and closing of the image.
5. To fill the region of interest for the image.
6. Program for edge detection algorithm.
7. Program of sharpen image using gradient mask.
8. Program for morphological operation: erosion and dilation
9. Program for DCT/IDCT computation.
10. To create a program for segmentation of an image using watershed transforms.

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Departmental Electives CS -802(B) Bioinformatics

Course Objectives:

1. Provide an introduction to what bioinformatics is and why it is important.
2. Provide an overview of the application areas of bioinformatics, with a focus.
3. Learn about various living organism.
4. Learn about different biological at molecular or cellular level.

Course Outcomes: After completion of the course students will be able to-

1. Understand selection of the simple features that can be annotated on a DNA sequence of interest.
2. To understand structures of proteins its significance.
3. Describe about Multiple Sequence Alignment, its significance, algorithms and tools used for MSA
4. To gain knowledge on various techniques, algorithms and tools employed in DNA sequencing, assembly and its applications in Next Generation Sequencing.
5. Understand about various approaches in genome sequencing and NGS

UNIT-I

Introduction-Introduction to bioinformatics, objectives of bioinformatics, Basic chemistry of nucleic acids, structure of DNA & RNA, Genes, structure of bacterial chromosome, cloning methodology, Data maintenance and Integrity Tasks.

UNIT-II

Bioinformatics Databases & Image Processing- Types of databases, Nucleotide sequence databases, Protein sequence databases, Protein structure databases, Normalization, Data cleaning and transformation, Protein folding, protein function, protein purification and characterization, Introduction to Java clients, CORBA, Using MYSQL, Feature Extraction.

UNIT-III

Sequence Alignment and database searching- Introduction to sequence analysis, Models for sequence analysis, Methods of optimal alignment, Tools for sequence alignment, Dynamics Programming, Heuristic Methods, Multiple sequences Alignment

UNIT-IV

Gene Finding and Expression- Cracking the Genome, Biological decoder ring, finding genes through mathematics & learning, Genes prediction tools, Gene Mapping, Application of Mapping, Modes of Gene Expression data, mining the Gene Expression Data.

UNIT-V

Proteomics & Problem solving in Bioinformatics- Proteome analysis, tools for proteome analysis, Genetic networks, Network properties and analysis, complete pathway simulation: E-cell, Genomic analysis for DNA & Protein sequences, Strategies and options for similarity search, flowcharts for protein structure prediction.

Recommended Books

1. Gopal & Jones, BIOINFORMATICS with fundamentals of Genomics & Proteomics, TMH Pub
2. Rastogi, Bioinformatics –Concepts, skills & Applications, CBS Pub
3. Bergeron, Bioinformatics computing, PHI
4. Claverie, Bioinformatics, Wiley pub
5. Baxevanis, Bioinformatics, Wiley Pub
6. Stekel, Microarray Bioinformatics, Cambridge

List of Experiments:

1. To find information in online databases.
2. To retrieve the sequence of the Human keratin protein from UniProt database and to interpret the results.
3. To retrieve the sequence of the Human keratin protein from Genbank database and to interpret the results.
4. To find the similarity between sequences using BLAST.
5. To find the similarity between sequences using FASTA
6. To align more than two sequences and find out the similarity between those sequences using ClustalW.

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Departmental Electives CS-802(C) Semantic Web & Ontologies

Course Objective:

1. To learn Web Intelligence and Knowledge Representation for the Semantic Web
2. To learn Ontology Engineering
3. To learn Semantic Web Applications, Services and Technology
4. To understand the role of ontology and inference engines in semantic web

Course Outcomes:

1. Ability to understand and knowledge representation for the semantic web.
2. Ability to modeling and variability.
3. Design semantic web meta data and RDF schema.
4. Understand Electronic sources for network analysis and different Ontology languages.
5. Evaluate Web- based social network and Ontology.

UNIT I

Semantic Web: Building Models , Calculating with knowledge, Exchanging Information, Semantic Web Technologies ,Types of Web :Smart Web & Dumb Web, Applications ,Semantic Data ,Search Engine for Semantic Web

UNIT II

Semantic Modeling: Modeling for human communication, Explanation and prediction, Mediating Variability: Variation & Classes, Variation & Layers, Expressivity in Modeling.

UNIT III

Resource Description Language RDF : Introduction , Advanced features , simple ontologies in RDF Schema , encoding of special data structures, RDF formal semantics ,syntactic reasoning with deduction rules ,Distributing data across web , Managing data from multiple sources .

UNIT IV

Web Ontology Language OWL : OWL syntax and Intuitive semantics , OWL species , Owl formal semantics : Description Logics , Model-Theoretic Semantics of OWL, Automated

reasoning with OWL, Ontology Matching and Distributed Information .

UNIT V

Semantic Web Application Architecture: RDF Parser/Serializer, RDF store: RDF data standards and Interoperability of RDF stores , RDF query engines , SPARQL: Query language for RDF , conjunctive Queries for OWL DL ,RDF backed web portals , Data federation .

Ontology Engineering: Constructing Ontologies manually, Reusing Existing Ontologies, Semiautomatic Ontology Acquisition, Ontology Mapping

Recommended Books:

1. Hitzler, Markus, Rudolph , “ Foundations of Semantic Web Technologies” , Chapman & Hall/CRC,2009,ISBN 9781420090505
2. Allemang , Hendler , “ Semantic Web for the working Ontologist” 2nd ed. Elsevier Pub
3. Liang Yu , “ Introduction to the Semantic Web and Semantic Web Services”, Chapman & Hall/CRC
4. Antoniou , Harmelen , “A semantic Web Primer”, PHI Pub.
5. Rajendra Akerkar ,“ Foundations of Semantic Web” , Narosa Publishing ,NewDelhi

List of Experiments:

1. Working with XML
2. Working with XML Schema, DTD
3. Design of Ontology using RDF
4. Design RDF document with different Serialization format (e.g. turtle,N-triple)
5. Design of Ontology using RDFS
6. Design of Ontology using OWL
7. Case study : Pizza Ontology
8. Querying Ontology using SPARQL
9. Case Study : Dbpedia
10. Case study : LOD Cloud

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Departmental Electives CS-802(D) Natural Language Processing

Course Objective:

1. To gain the knowledge for developing advanced technology of computer systems like speech recognition and machine translation.

Course Outcome: Upon completion of the course, the students will be able to:

1. To tag a given text with basic Language features
2. To design an innovative application using NLP components
3. To implement a rule based system to tackle morphology/syntax of a language
4. To design a tag set to be used for statistical processing for real-time applications
5. To compare and contrast the use of different statistical approaches for different types of NLP applications.

UNIT I

Introduction to Natural Language Understanding- Levels of language analysis- Syntax, Semantics, Pragmatics, Applications, Ambiguity, Morphology, Parsing with Finite State Transducers, Regular Expressions, Stemmer, Spelling errors.

UNIT II

Computational Phonology: speech sound, phonetic transcription, text to speech, Pronunciation Variations, Bayesian Method to spelling and pronunciations, Minimum Edit Distance, Weighted Automata, N-grams.

UNIT III

HMM and speech recognition, Viterbi algorithm, Acoustic processing of speech, Feature Extraction, Speech Synthesis; Part-of-Speech Tagging: rule based, stochastic, transformation based.

UNIT IV

Syntax Processing: Parsing with CFG, CKY parsing and the Earley parser, Probabilistic parsing; Semantic Processing: Meaning representation, First Order Predicate Calculus. Lexical Semantics: Internal structure of words, thematic roles, Primitive decomposition, WordNet.

UNIT V

Word sense disambiguation; Information Retrieval: Vector space model, Improving user queries; Pragmatic Processing: Discourse; Natural Language Generation, Machine Translation.

Recommended Books:

1. D. Jurafsky and J.H. Martin; Speech and Language Processing; Processing; Prentice Hall; 2000.
2. C. Manning and H.Schutze, "Foundations of Statistical Natural Language Processing",
3. James Allen. "NaturalLanguage Understanding",AddisonWesley,1994.
4. Richard M Reese, Natural Language Processing with Javall, OReilly Media, 2015.
5. Tanveer Siddiqui, U.S. Tiwary, Natural Language Processing and Information Retrieval, Oxford University Press, 2008

List of Experiments:

1. Write a program on Word Analysis.
2. Write a program on Word Generation
3. Write a program on Morphology
4. Write a program on N-Grams
5. Write a program on Part of Tagging
6. Part of Tagging POS Tagging:Viterbi Algorithm

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Open Electives CS 803(A) Digital Marketing & SEO

Course Objective:

1. To facilitate students to understand digital marketing and its importance.
2. To help students to gain a basic understanding social and email marketing.
3. To inculcate knowledge of Search Engine Optimization.

Course Outcomes:

1. Understand the concept of digital marketing and its real-world iterations
2. Articulate innovative insights of digital marketing enabling a competitive edge
3. Understand how to create and run digital media-based campaigns
4. Identify and utilize various tools such as social media etc.
5. Understand how to do SEO Audit

UNIT-1

Digital Marketing: Introduction, Moving from Traditional to Digital Marketing, Integrating Traditional and Digital Marketing, Reasons for Growth. Need for a comprehensive Digital Marketing Strategy. Concepts: Search Engine Optimization (SEO); Concept of Pay Per Click

UNIT-2

Social Media Marketing: Introduction, Process - Goals, Channels, Implementation, Analyze. Tools: Google and the Search Engine, Facebook, Twitter, YouTube and LinkedIn. Issues: Credibility, Fake News, Paid Influencers; Social Media and Hate/ Phobic campaigns. Analytics and linkage with Social Media. The Social COMMUNITY.

UNIT-3

Email Marketing: Introduction, email marketing process, design and content, delivery, discovery. Mobile Marketing: Introduction and concept, Process of mobile marketing: goals, setup, monitor, analyze; Enhancing Digital Experiences with Mobile Apps. Pros and Cons; Targeted advertising. Issues: Data Collection, Privacy, Data Mining, Money and Apps, Security, Spam. Growth Areas.

UNIT-4

Managing Digital Marketing: Content Production; Video based marketing; Credibility and Digital Marketing; IoT; User Experience; Future of Digital Marketing.

UNIT-5

SEO Analytics, Monitoring & Reporting : Google Search Console (GSC), Key Sections & Features of GSC; How to monitor SEO progress with Key Features of GSC: Overview, Performance, URL Inspection, Coverage, Sitemaps, Speed, Mobile Usability, Backlinks, Referring Domains, Security & Manual Actions, How to do SEO Reporting

Recommended Books:

1. Dodson, Ian: The Art of Digital Marketing - The Definitive Guide to Creating Strategic, Targeted, and Measurable Online Campaigns. Wiley
2. Ryan, Damien: Understanding Digital Marketing - Marketing Strategies for Engaging the Digital Generation. Kogan Page Limited.
3. Gupta, Sunil: Driving Digital Strategy. Harvard Business Review Press
4. Tuten, Tracy L. and Solomon, Michael R.: Social Media Marketing. Sage
5. Bhatia, Puneet S.: Fundamentals of Digital Marketing. Pearson
6. Kotler, Philip: Marketing 4.0: Moving from Traditional to Digital. Wiley

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Open Electives 803(B) Agile Software Development

Course Objective:

1. To learn best practices and methods of software development

Course Outcomes: After completing the course student should be able to:

1. Describe the fundamental principles and practices associated with each of the agile development methods.
2. Compare agile software development model with traditional development models and identify the benefits and pitfalls.
3. Use techniques and skills to establish and mentor Agile Teams for effective software development.
4. Apply core values and principles of Agile Methods in software development.

UNIT I

Fundamentals of Agile Process: Introduction and background, Agile Manifesto and Principles, Stakeholders and Challenges, Overview of Agile Development Models: Scrum, Extreme Programming, Feature Driven Development, Crystal, Kanban, and Lean Software Development.

UNIT II

Agile Projects: Planning for Agile Teams: Scrum Teams, XP Teams, General Agile Teams, Team Distribution; Agile Project Lifecycles: Typical Agile Project Lifecycles, Phase Activities, Product Vision, Release Planning: Creating the Product Backlog, User Stories, Prioritizing and Estimating, Creating the Release Plan; Monitoring and Adapting: Managing Risks and Issues, Retrospectives.

UNIT III

Introduction to Scrum: Agile Scrum Framework, Scrum Artifacts, Meetings, Activities and Roles, Scrum Team Simulation, Scrum Planning Principles, Product and Release Planning, Sprinting: Planning, Execution, Review and Retrospective; User story definition and Characteristics, Acceptance tests and Verifying stories, Burn down chart, Daily scrum, Scrum Case Study.

UNIT IV

Introduction to Extreme Programming (XP): XP Lifecycle, The XP Team, XP Concepts: Refactoring, Technical Debt, Timeboxing, Stories, Velocity; Adopting XP: Pre-requisites, Challenges; Applying XP: Thinking- Pair Programming, Collaborating, Release, Planning, Development; XP Case Study.

UNIT V

Agile Software Design and Development: Agile design practices, Role of design Principles, Need and significance of Refactoring, Refactoring Techniques, Continuous Integration, Automated build tools, Version control; Agility and Quality Assurance: Agile Interaction Design, Agile approach to Quality Assurance, Test Driven Development, Pair programming: Issues and Challenges.

Recommended Books:

1. Robert C. Martin, Agile Software Development- Principles, Patterns and Practices, Prentice Hall, 2013.
2. Kenneth S. Rubin, Essential Scrum: A Practical Guide to the Most Popular Agile Process, Addison Wesley, 2012.
3. James Shore and Shane Warden, The Art of Agile Development, O'Reilly Media, 2007.
4. Craig Larman, —Agile and Iterative Development: A manager's Guide, Addison-Wesley, 2004.
5. Ken Schwaber, Mike Beedle, Agile Software Development with Scrum, Pearson, 2001.
6. Cohn, Mike, Agile Estimating and Planning, Pearson Education, 2006.
7. Cohn, Mike, User Stories Applied: For Agile Software Development Addison Wisley, 2004.

Online Resources:

1. IEEE Transactions on Software Engineering
2. IEEE Transactions on Dependable and Secure Computing
3. IET Software
4. ACM Transactions on Software Engineering and Methodology (TOSEM)
5. ACM SIGSOFT Software Engineering Notes

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Open Electives CS803(C) Quantum Computing

Course Objective:

Objective of the course: The objective of this course is to provide the students an introduction to quantum computation. Students understand the concept of Entanglement, Quantum Computer, and Quantum Algorithm.

Course Outcomes:

1. Students would learn the framework of quantum computation, and how that may be useful for future quantum technologies.
2. The students learn concept of Density Operation and Quantum measurement theory.
3. understand the main concepts Entanglement and basic of Quantum Computer.
4. Design and understand the concept of computer algorithm.
5. Ability to understand and Quantum Error Correction.

UNIT I

Introduction to quantum mechanics : Postulates of quantum mechanics, Qubit and quantum states, Vector Spaces, Single Qubit Gates, multiple Qubit Gates, Controlled Gates, Composite Gates, Matrices and operators.

UNIT II

Density operators :Density Operator for a Pure State, Density Operator for a Mixed State, Properties of a Density Operator, Characterizing Mixed States, Completely Mixed States, Partial Trace and Reduced Density Operator.

Quantum measurement theory: Distinguishing Quantum States and Measurement, Projective Measurements, Measurements on Composite Systems, Generalized Measurements, Positive Operator Valued Measures.

UNIT III

Entanglement: Quantum state entanglement ,Bell's Theorem, The Pauli Representation, Using Bell States For Density Operator Representation, Quantum gates and circuits: Single Qubit Gates, The Z Y Decomposition ,Basic Quantum Circuit Diagrams, Controlled Gates, Application of Entanglement in teleportation and super dense coding., Distributed quantum communication

Quantum Computer : Guiding Principles, Conditions for Quantum Computation, Harmonic Oscillator Quantum Computer, Optical Photon Quantum Computer – Optical cavity Quantum electrodynamics, Ion traps, Nuclear Magnetic resonance.

UNIT IV

Quantum Algorithm: Hadamard Gates, The Phase Gate, Matrix Representation of Serial and Parallel Operations, Quantum Interference, Quantum Parallelism and Function Evaluation, Deutsch -Jozsa Algorithm, Quantum Fourier Transform, Phase Estimation, Shor's Algorithm ,Quantum Searching and Grover's Algorithm

UNIT V

Quantum Error Correction: Introduction, Shor code, Theory of Quantum Error Correction, Constructing Quantum Codes, Stabilizer codes, Fault Tolerant Quantum Computation, Entropy and information –Shannon Entropy, Basic properties of Entropy, Von Neumann, Strong Sub Additivity, Data Compression, Entanglement as a physical resource.

Recommended Books:

1. Quantum Computing Explained: David McMahon, Wiley Interscience (IEEE Computer Science).
2. Quantum Computing without Magic Devices : Zdzislaw Meglicki; PHI .
3. Quantum Computation and Quantum Information: M.A. Nielsen & Isaac L. Chuang, Cambridge University Press .
4. Quantum Computing and communications: An Engineering Approach: Sandor Imre and Ferenc Balazs, Wiley.

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Open Electives CS- 803 (D) Mobile Application Development

Course Objective:

1. To facilitate students to understand android SDK
2. To help students to gain a basic understanding of Android application development
3. To inculcate working knowledge of Android Studio development tool

Course Outcomes: After the completion of this course, the students will be able to:

1. Identify various concepts of mobile programming that make it unique from programming for other platforms.
2. Critique mobile applications on their design pros and cons.
3. Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
4. Program mobile applications for the Android operating system that use basic and advanced phone features.
5. Deploy applications to the Android marketplace for distribution.

UNIT I

Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building you First Android application, Understanding Anatomy of Android Application, Android Manifest file.

UNIT II

Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

UNIT III

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

UNIT IV

Testing Android applications, Publishing Android application, Using Android preferences,

Managing Application resources in a hierarchy, working with different types of resources.

UNIT V

Using Common Android APIs: Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

Recommended Books:

1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd ed. (2011)
2. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
3. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd3.R3.
Android Application Development All in one for Dummies by Barry Burd, Edition: I