Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

New Scheme of Examination as per AICTE Flexible Curricula

VI Semester Bachelor of Technology (B.Tech.) Information Technology *(w.e.f. Jan, 2020)*

S.No.	Subject Code	Category	Subject Name	Maximum Marks Allotted					Total Marks	Contact Hours per week			Total Credits
				Theory			Practical						
				End Sem.	Mid Sem. Exam.	Quiz/ Assignment	End Sem	Term work / Lab Work & Sessional		L	T	P	
1.	IT601	DC	Computer Graphics & Multimedia	70	20	10	30	20	150	2	1	2	4
2.	IT602	DC	Wireless and Mobile Computing	70	20	10	30	20	150	2	1	2	4
3.	IT603	DE	Departmental Elective	70	20	10	-	-	100	4	-	0	4
4.	IT604	OE	Open Elective	70	20	10	-	-	100	4	-	0	4
5.	IT605	D Lab	Programming in Python	-	-	-	30	20	50	-	-	6	3
6.	IT606	O/E Lab	Android Programming	-	-	-	30	20	50	-	-	6	3
7.	IT607	IN	Internship-III	To be completed anytime during Fifth/Sixth semester. Its evaluation/credit to be added in Seventh Semester.									
8.	IT608	P	Minor Project II	-	-	-	-	50	50	-	-	4	2
9.	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	280	80	40	120	130	650	12	2	20	24

Departmental Electives	Open Electives
603 (A) Compiler Design	604(A) Intellectual Property Rights
603 (B) Data Mining	604(B) Software Engineering
603 (C) Embedded Systems	604 (C) Wireless Sensor Networks

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

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI- semester

IT 601 Computer Graphics & Multimedia

Course Objectives:

1. To introduce the principles of computer graphics and the components of a graphics system
2. To introduce basic algorithms for drawing line, circle and curves.
3. To develop understanding of the basic principles of 2D and 3D computer graphics and how to transform the shapes to fit them as per the picture definition.
4. To introduce multimedia architecture and hardware
5. To introduce multimedia file formats

Unit I

Introduction to Raster scan displays, Storage tube displays, refreshing, flickering, interlacing, colour monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.

Unit II

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Beizier Method, B-spline Method.

Unit III

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen, Point Clipping, Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV.

Unit IV

Introduction to multimedia components applications, Multimedia System Architecture, Evolving technologies for Multimedia, Defining objects for Multimedia systems, Multimedia Data interface standards, Multimedia Databases, Multimedia Hardware, SCSI, IDE, MCI, Multimedia Tools, presentation tools, Authoring tools.

Unit V

Compression & Decompression, Multimedia Data & File Format standards, TIFF, MIDI, JPEG, DIB, MPEG, RTF, Multimedia I/O technologies, Digital voice and audio, Video image and animation, Full motion video, Storage and retrieval technologies.

References:-

1. Donald Hearn and M.Pauline Baker, Computer Graphics C Version, Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, Multimedia Systems and Design, PHI Learning,
3. Tay Vaughan, Multimedia making it work, Tata McGraw Hill edition.
4. Amarendra N Sinha & Arun D Udai, Computer Graphics, McGraw Hill publication.
5. Mukherjee, Fundamental of Computer Graphics and Multimedia, PHI Learning.

List of Practicals:

1.Write a program to implement DDA line drawing algorithm
2.Write a program to implement Bresenham's line drawing algorithm.
3.Write a program to implement Bresenham's circle drawing algorithm.
4.Write a program to draw an ellipse using Bresenham's algorithm.
5.Write a program to perform various transformations on line , square & rectangle.
6.Write a program to implement Cohen Sutherland line clipping algorithm.
7.Write a program to implement Liang-Bersky line clipping algorithm.
8.Write a program to implement Cohen-Sutheland polygon clipping algorithm to clip a polygon with a Pattern.
9.Write a program to convert a color given in RGB space to it's equivalent CMY color space.
10.Study of various Multimedia file formats:-RTF,MIDI,GIF,JPEG,MPEG,TIFF etc.
11.Write a program to implement JPEG compression scheme for still images.
12.Write a program to perform Packbits compression & decompression.
13.Write a short program to create a TIFF file using bitmap segments and text files as the TIFF File components.
14. Write a program to convert a BMP file into either JPEG or GIF file.
15.Study of various Multimedia Authoring Tools.

Course Outcomes:

Upon completion of this course, students will be able to-

1. Understand the core concepts of computer graphics.
2. Implement various shapes drawing algorithms.
3. Apply geometric transformations on graphic objects and also implement clipping, shading and colour models.
4. Understand multimedia systems architecture, multimedia components and use various multimedia tools.
5. Perform activities involved in design, development and testing of modeling, rendering, shading and animation.

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-Semester

IT 602 Wireless and Mobile Computing

Course Objectives:

1. To provide an overview of Wireless Communication networks area and its applications in communication engineering.
2. To introduce various standards of mobile communication.
3. To explain the various terminology, principles, devices, schemes, concepts used in Wireless Communication Networks.
4. To introduce the concepts of Adhoc networks and Sensor networks and their issues
5. To introduce various security threats in wireless networks and the techniques for the prevention and detection of threats

Unit I:

Antenna , radiation pattern, antenna types, antenna gain, propagation modes, types of fading. Model for wireless digital communication, multiple access technique-SDMA, TDMA, FDMA, CDMA, DAMA, PRMA, MAC/CA, Cellular network organization, operations of cellular system, mobile radio propagation effects, handoff, power control, sectorization, traffic engineering, Infinite sources, lost calls cleared, grade of service, poison arrival process

Unit II:

GSM- Services, system architecture, radio interface, logical channels, protocols, localization and calling, handover, security, HSCSD, GPRS-architecture, Interfaces, Channels, mobility management DECT, TETRA, UMTS.

Unit III:

IEEE 802.11: LAN-architecture, 802.11 a, b and g, protocol architecture, physical layer, MAC layer , MAC management, HIPERLAN-protocol architecture, physical layer, access control sub layer, MAC sub layer. Bluetooth-user scenarios- physical layer, MAC layer.

Unit IV:

Mobile IP, DHCP, Ad hoc networks: Characteristics, performance issue, routing in mobile host. Wireless sensor network, Mobile transport layer: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, transaction oriented TCP. Introduction to WAP.

Unit V:

Intruders, Intrusion detection, password management, viruses and related threads, worms, trojan horse defense, difference biometrics and authentication system, firewall design principle.

References:-

1 J. Schiller, “Mobile Communication”, Addision , Wiley
2 William Stalling, “Wireless Communication and Network”, Pearson Education
3 Upena Dalal,” Wireless Communication”, Oxford Higher Education
4 Dr. Kamilo Feher, “Wireless Digital communication”, PHI
5 William C.Y Lee, “Mobile Communication Design Fundamental” , John Wiley.

Suggested List of Practicals:

To implement mobile network using open source softwares like NS2 etc.
Implement Code Division Multiple Access (CDMA).
To write a programme to implement concept of frequency reuse when given size of geographical area and the set of available frequencies.
Study of OPNET tool for modeling and simulation of different cellular standards.
Study and Analysis of wired network.
Study and Analysis of wireless network.
Study and Analysis of Bluetooth.
Study of Mobile IP.
Write programs using WML (Wireless Markup Language) Rajiv Gandhi Proudyogiki Vishwavid

Course Outcomes:

Upon completion of this course, students will be able to-

1. Explain the basic concepts of wireless network and wireless generations.
2. Demonstrate the different wireless technologies such as CDMA, GSM, GPRS etc
3. Explain the design considerations for deploying the wireless network infrastructure.
4. Appraise the importance of Adhoc networks such as MANET and Wireless Sensor networks
5. Differentiate and support the security measures, standards. Services and layer wise security considerations

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-Semester

Departmental Elective IT 603(A) Compiler Design

Course Objectives:

1. To teach the students the basic concepts of Compiler, programming languages and develop an understanding of the compilation phases
2. To make students understand what is syntax analysis and various types of parsers
3. To introduce syntax trees and dependency graphs
4. To introduce intermediate code generation, memory management and the role of symbol table and its organization
5. To introduce Code generation and code optimization

UNIT-I:
Introduction to Compiler, analysis of source program, phases and passes, Bootstrapping, lexical analyzers, data structures in compilation – LEX: lexical analyzer generator, Input buffering, Specification and Recognition of tokens, YACC, The syntactic specification of programming languages: Context free grammars, derivation and parse trees, capabilities of CFG.

UNIT-II:
Syntax Analysis: working of Parser, Top down parsing, Bottom-up parsing, Operator precedence parsing, predictive parsers, LR parsers (SLR, Canonical LR, LALR), constructing SLR parsing tables, constructing Canonical LR parsing tables, Constructing LALR parsing tables, using ambiguous grammars, an automatic parser generator.

UNIT-III:
Syntax Directed Translation: Definitions, Inherited Attributes, L-attributed definitions, S-attributed definitions, Dependency graph, Construction of syntax trees, Top down translation, postfix notation, bottom up evaluation.

UNIT-IV:
Intermediate Code Generation: Three address code, quadruple & triples, translation of assignment statements, Boolean expression and control structures, Backpatching, Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management.

UNIT-V:
Code Optimization and Generation: organization of code optimizer, basic blocks and flow graphs, DAG representation of basic blocks, loops in flow graph, peephole optimization, Basic of block optimization.

References:-

1. A. V. Aho, R. Sethi & J. D. Ullman, Compilers: Principles, Techniques and Tools, Pearson Ed.
2. Alfred V. Aho, Jeffrey D. Ullman, Principles of Compiler Design, Narosa Publishing House.
3. Ronald Mak, Writing Compilers and Interpreters, Wiley IndiacEdition.
4. Louden, Compiler Construction, Cengage learning.

Course Outcomes:

Upon completion of this course, students will be able to-

1. Demonstrate an understanding of the compilation phases.
2. Specify and analyze the lexical, syntactic and semantic structures of advanced language features.
3. Write a scanner, parser, and semantic analyser without the aid of automatic generators.
4. Describe techniques for intermediate code and machine code optimization.
5. Design the structures and support required for compiling advanced language features.

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-

Semester

Departmental Elective IT 603(B) Data Mining

Course Objectives:

1. To introduce data warehouse and its components
2. To introduce knowledge discovery process, data mining and its functionalities
3. To develop understanding of various algorithms for association rule mining and their differences
4. To introduce various classification techniques
5. To introduce various clustering algorithms.

Unit I:

Data Warehousing**:** Need for data warehousing , Basic elements of data warehousing, Data Mart, Data Warehouse Architecture, extract and load Process, Clean and Transform data, Star ,Snowflake and Galaxy Schemas for Multidimensional databases, Fact and dimension data, Partitioning Strategy-Horizontal and Vertical Partitioning, Data Warehouse and OLAP technology, Multidimensional data models and different OLAP Operations, OLAPServer: ROLAP, MOLAP, Data Warehouse implementation, Efficient Computation of Data Cubes, Processing of OLAP queries, Indexing data.

Unit II:

Data Mining**:** Data Preprocessing, Data Integration and Transformation, Data Reduction, Discretizaion and Concept Hierarchy Generation, Basics of data mining, Data mining techniques, KDP (Knowledge Discovery Process), Application and Challenges of Data Mining

Unit III:

Mining Association Rules in Large Databases**:** Association Rule Mining, Single-Dimensional Boolean Association Rules, Multi-Level Association Rule, Apriori Algorithm, Fp- Growth Algorithm, Time series mining association rules, latest trends in association rules mining.

Unit IV:

Classification and Clustering: Distance Measures, Types of Clustering Algorithms, K-Means Algorithm, Decision Tree, Bayesian Classification, Other Classification Methods, Prediction, Classifier Accuracy, Categorization of methods, Outlier Analysis.

Unit V:

Introduction of Web Mining and its types, Spatial Mining, Temporal Mining, Text Mining, Security Issue, Privacy Issue, Ethical Issue.

References:-

1. Arun k Pujari “Data Mining Technique” University Press
2. Han,Kamber, “Data Mining Concepts & Techniques”,
3. M.Kaufman., P.Ponnian, “Data Warehousing Fundamentals”, John Wiley.
4, M.H.Dunham, “Data Mining Introductory & Advanced Topics”, Pearson Education.
5. Ralph Kimball, “The Data Warehouse Lifecycle Tool Kit”, John Wiley.
6. E.G. Mallach , “The Decision Support & Data Warehouse Systems”, TMH

Course Outcomes:

Upon completion of this course, students will be able to-

1. Demonstrate an understanding of the importance of data warehousing and OLAP technology
2. Organize and Prepare the data needed for data mining using pre preprocessing techniques
3. Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on various data sets.
4. Define and apply metrics to measure the performance of various data mining algorithms.
5. Demonstrate an understanding of data mining on various types of data like web data and spatial data

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-Semester

Departmental Elective IT 603(C) Embedded Systems

Course Objectives:

1. To introduce students with knowledge about the basic functions and applications of embedded systems
2. To introduce the architecture of embedded systems
3. To introduce the various communication protocols
4. To enable students to have knowledge of the memory types and supporting technologies of embedded systems.
5. To enable students to have knowledge about the development of embedded software

UNIT-I Introduction to Embedded Systems: Definition of embedded system, embedded systems vs. general computing systems, history of embedded systems, classification, major application areas, purpose of embedded systems, characteristics and quality attributes of embedded systems, common design metrics, and processor technology: general purpose processor, application specific processor, single purpose processor.

UNIT-II Embedded System Architecture: Von Neumann v/s Harvard architecture, instruction set architecture, CISC and RISC instructions set architecture, basic embedded processor, microcontroller architecture, CISC & RISC examples: 8051, ARM, DSP processors.

UNIT-III Input Output and Peripheral Devices Timers and counters, watchdog timers, interrupt controllers, PWM, keyboard controller, analog to digital converters, real time clock. Introduction to communication protocols: basic terminologies, concepts, serial protocol: I2C, CAN, firewire, USB. Parallel protocols: PCI bus, IrDA, bluetooth, IEEE 802.11, wireless protocols.

UNIT-IV Memory System Architecture Caches, virtual memory, MMU, address translation, memory and interfacing, memory write ability and storage performance. Memory types, composing memory – advance RAM interfacing, microprocessor interfacing I/O addressing, interrupts, direct memory access, arbitration multilevel bus architecture.

UNIT-V Embedded System Supporting Technologies Difference between normal OS and RTOS, scheduling algorithms. Case study: Tiny OS, VxWorks, QNX. Overview of VLSI technology, introduction to device drivers. Case studies: washing machine, air-conditioning, auto focus camera.

References:

1. F Vahid, T Giogarvis, Embedded systems: A unified hardware/software approach, Wiley, 1999.

2. Raj Kamal, Embedded Systems Introduction, 2nd Ed., TMH publication, 2015.

3.David E Simons, An Embedded Software Primer, Pearson, 1999.

Course Outcomes:

Upon completion of this course, students will be able to-

1. Explain the embedded system concepts and architecture of embedded systems
2. Describe the architecture of 8051 microcontroller and write embedded program for 8051 microcontroller
3. Select elements for an embedded systems tool.
4. Understand the memory types used in embedded systems
5. Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-Semester

Open Elective IT 604(A) Intellectual Property Rights

Course Objectives:

1. To enable Students to understand Primary forms of IPR
2. To enable Students to understand what is infringement of copyright and its consequences
3. To introduce criteria and procedure for obtaining patents
4. To enable Students to understand the registration procedures related to IPR.
5. To expose Students to contemporary issues and enforcement policies in IPR.

UNIT I Introduction

Introduction and Justifications of IPR, Nature of IP, Major forms of IP- Copyright, Patent, Trade Marks Designs, Geographic indication, layout design of Semi conductors, Plant varieties, Concept & Meaning of Intellectual Property. Major international documents relating to the protection of IP - Berne Convention, Paris Convention, TRIPS. The World Intellectual Property Organization (WIPO).

UNIT II Copyright

Meaning and historical development of copyright , Subject matter , Ownership of copyright, Term of copyright, Rights of owner, Economic Rights, Moral Rights. Assignment and licence of rights, Infringement of copyright, Exceptions of infringement, Remedies, Civil, Criminal, Administrative, Registration Procedure.

UNIT III Patents

Meaning and historical development,. Criteria for obtaining patents, Non patentable inventions, Procedure for registration, Term of patent, Rights of patentee, Compulsory licence, Revocation, Infringement of patents, Exceptions to infringement, Remedies, Patent office and Appellate Board.

UNIT IV – Trade Marks, Designs & GI

Trade Marks: Functions of marks, Procedure for registration, Rights of holder, Assignment and licensing of marks, Infringement, Trade Marks Registry and Appellate Board.

Designs: Meaning and evolution of design protection, Registration, Term of protection, Rights of holder, unregistered designs.

Geographical Indication: Meaning and evolution of GI, Difference between GI and Trade Marks, Registration, Rights, Authorised user.

UNIT V Contemporary Issues & Enforcement of IPR

IPR & sustainable development, The Impact of Internet on IPR. IPR Issues in biotechnology, E-Commerce and IPR issues, Licensing and enforcing IPR, Case studies in IPR

References:

1. P. Narayanan, Intellectual Property Law, Eastern Law House
2. . Neeraj Pandey and Khushdeep[Dharni, Intellectual Property Rights, PHI, 2014
3. N.S Gopalakrishnan and T.G. Agitha, Principles of Intellectual Property, Eastern Book Co. Lucknow, 2009.
4. Anand Padmanabhan, Enforcement of Intellectual Property, Lexis Nexis Butterworths, Nagpur, 2012.
5. Managing Intellectual Property The Strategic Imperative, Vinod V. Sople, PHI.
6. Prabuddha Ganguli, " Intellectual Property Rights" Mcgraw Hill Education, 2016.

Course Outcome:

Upon completion of this course, students will be able to:

1. Understand Primary forms of IPR
2. Assess and critique some basic theoretical justification for major forms of IP Protection
3. Compare and contrast the different forms of IPR in terms of key differences and similarities.
4. Uderstand the registration procedures related to IPR.
5. Have exposure to contemporary issues and enforcement policies in IPR.

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Information Technology, VI- semester

Open Elective IT 604(B) Software Engineering

Course Objectives:

1. To introduce software development life cycle and various software process models
2. To introduce measures and metrics for software quality, reliability and software estimation techniques
3. To develop an understanding of software analysis and design phases
4. To introduce coding standards, guidelines and various software testing techniques
5. To introduce various activities for software maintenance and quality assurance

Unit I

Introduction, Software- problem and prospects Software development process: System Development Life Cycle, Waterfall Model, Spiral Model and other models, Unified process Agile development-Agile Process- Extreme Programming- Other agile Process models.

Unit II

Measures, Metrics and Indicators, Metrics in the Process and Project Domains, Software Measurement, Metrics of Software Quality, S/W reliability, Software estimation techniques, LOC and FP estimation. Empirical models like COCOMO, project tracking and scheduling, reverse engineering.

Unit III

Software requirements and specification: feasibility study, Informal/formal specifications, pre/post conditions, algebraic specification and requirement analysis models, Specification design tools. Software design and implementation: Software design objectives and techniques, User interface design, Modularity, Functional decomposition, DFD, Data Dictionary, Object oriented design, Design patterns implementation strategies like top- down, bottom-up.

Unit IV

Coding standard and guidelines, programming style, code sharing, code review, rapid prototyping, specialization, construction, class extensions, intelligent software agents, reuse performance improvement, debugging. Software Testing Strategies: Verification and Validation, Strategic Issues, test plan, white box, black-box testing, unit and integration testing, system testing test case design and acceptance testing, maintenance activities.

Unit V

Software Maintenance: Software Supportability, Reengineering, Business Process Reengineering, Reverse Engineering, Restructuring, Forward Engineering, Economics of Reengineering, project scheduling and tracking plan, project management plan, SQA and quality planning, SCM activities

and plan, CMM, Software project management standards, Introduction to component based software engineering.

References:

1 P.S. Pressman, Software Engineering. A Practitioner's Approach, TMH.
2 Rajib Mall, Fundamental of Software Engineering, PHI.
3 Hans Van Vliet, Software Engineering, Wiley India Edition.
4 James S. Peters, Software Engineering, Wiley India Edition.
5 Pankaj Jalote, Software Engineering: A Precise Approach, Wiley India.
6 Kelkar, Software Project Management, PHI Learning

Course Outcomes:

Upon completion of this course, students will be able to-

1. Define various software application domains and remember different process model used in software development.
2. Understand various measures of software and Generate project schedule.
3. Describe functional and non-functional requirements of software and develop design models of software.
4. Investigate the reason for bugs and apply the software testing techniques in commercial environment.
5. Understand various activities to be performed for improving software quality and software maintenance.

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-Semester

Open Elective IT 604(C) Wireless Sensor Networks

Course Objectives:

1. To Understand the basic WSN technology and supporting protocols
2. Understand the medium access control protocols and address physical layer issues
3. Learn localization concepts for sensor networks
4. Learn energy efficiency and power control in sensor networks
5. Understand the security challenges in sensor networks.

Unit I

Overview of Wireless Sensor Networks: Network Characteristics, Network Applications, Network Design Objectives, Network Design Challenges, Technological Background : MEMS Technology , Wireless Communication Technology , Hardware and Software Platforms, Wireless Sensor Network Standards, Introduction, Network Architectures for Wireless Sensor Networks, Classifications of Wireless Sensor Networks, Protocol Stack for Wireless Sensor Networks.

Unit II

Fundamental MAC Protocols, MAC Design for Wireless Sensor Networks, MAC Protocols for Wireless Sensor Networks: Contention-Based Protocols, Contention-Free Protocols, Hybrid Protocols. Introduction, Fundamentals and Challenges, Taxonomy of Routing and Data Dissemination Protocols, Overview of Routing and Data Dissemination Protocols: Location-Aided Protocols, Layered and In-Network Processing-Based Protocols, Data-Centric Protocols, Multipath-Based Protocols, Mobility-Based Protocols, QoS Based Protocols, Heterogeneity-Based Protocols.

Unit III

Introduction, Query Processing in Wireless Sensor Networks, Data Aggregation in Wireless Sensor Networks, Node Localization: Concepts and Challenges of Node Localization Technologies, Ranging Techniques for Wireless Sensor Networks, Wireless Localization Algorithms, Wireless Sensor Node Localization.

Unit IV

Need for Energy Efficiency and Power Control in Wireless Sensor Networks, Passive Power Conservation Mechanisms: Physical-Layer Power Conservation Mechanisms, MAC Layer Power Conservation Mechanisms, Higher Layer Power Conservation Mechanisms, Active

Power Conservation Mechanisms: MAC Layer Mechanisms, Network Layer Mechanisms, Transport Layer Mechanisms.

Unit V

Fundamentals of Network Security, Challenges of Security in Wireless Sensor Networks, Security Attacks in Sensor Networks, Protocols and Mechanisms for Security, IEEE 802.15.4 and ZigBee Security .

References:

1. Wireless Sensor Networks A Networking Perspective, Jun Zheng & Abbas Jamalipour, a john Wiley & sons, Inc., publication .
2. Wireless sensor networks Technology, Protocols, and Applications , kazem sohraby, daniel minoli, taieb znati , a john Wiley & sons, Inc., publication .
3. Fundamentals of wireless sensor networks theory and practice, Waltenegus Dargie, Christian Poellabauer, A John Wiley and Sons, Ltd., Publication.

Course Outcomes:

Upon completion of this course, students will be able to-

1. Have knowledge of some existing applications of wireless sensor actuator networks
2. Learn the various hardware, software platforms that exist for sensor networks
3. Have knowledge of the various protocols for sensor networks
4. Analyze modeling and simulation of sensor networks
5. Understand what research problems sensor networks pose in disciplines such as signal processing, wireless communications and even control systems

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-

Semester

IT 605 Programming in Python

Python –Overview
Introduction, History, Features

Python –Environment Setup
Local Environment Setup, Getting Python, Installation of Python, Use of IDE

Python –Basic Syntax
Python Identifiers, Reserved Words, Lines & Indentation, Multiline Statements, Quotation in Python, Comments & other useful constructs

Python –Variables
Assigning Values to Variables, Multiple Assignment, Standard Data Types

Python Numbers
Python Strings, Python Lists, Python Tuples, Dictionary, DataType Conversion

Python –Basic Operators
Types of Operators, Arithmetic Operators, Comparison Operators, Assignment Operators, Bitwise Operators, Logical Operators, Operator Precedence.

Python –Decision Making & Loops
Flowchart, If statement Syntax

Python-Functions
Syntax for defining a function, Calling a Function, Function Arguments, Anonymous Functions
Python-Applications & Further Extensions

References:

1. Python Crash Course: A Hands-On, Project-Based Introduction to Programming, by Eric Matthes, No Starch Press
2. Learn Python the Hard Way' by Zed A. Shaw (3rd Edition), Addison Wesley
3. Head-First Python, by Paul Barry, O'Reilly
4. 'Python Programming' by John Zelle, Franklin, Beedle & Associates Inc;

Course Outcomes:
Upon completion of this course, students will be able to-

1. Install Python and have knowledge of syntax of Python
2. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
3. Express different Decision Making statements and Functions
4. Develop code in Python using functions, loops etc.
5. Design GUI Applications in Python and evaluate different database operations

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New Scheme Based On AICTE Flexible Curricula

Information Technology, VI-Semester

IT 606 Android Programming

Introduction to Android:
A little Background about mobile technologies, Overview of Android, An Open Platform for Mobile development, Open Handset Alliance, What does Android run On – Android Internals, Why to use Android for mobile development,

Developing for Android:
My First Android Application, How to setup Android Development Environment, Android development Framework - Android-SDK, Eclipse, Emulators – What is an Emulator / Android AVD, Creating & setting up custom Android emulator, Android Project Framework, My First Android Application.

Android Activities and UI Design
Understanding Intent, Activity, Activity Lifecycle and Manifest, Creating Application and new Activities, Expressions and Flow control, Android Manifest, Simple UI -Layouts and Layout properties, Fundamental Android UI Design, Introducing Layouts
Creating new Layouts, Drawable Resources, Resolution and density independence (px,dip,dp,sip,sp), XML Introduction to GUI objects viz., Push Button Text / Labels, EditText, ToggleButton, WeightSum, Padding, Layout Weight

Reference:
Head First Android Development, 2nd edition, OREILLY.
Android App Development for Dummies, 3rd edition, Michael Burton, John Wiley sons
Busy Coder's Guide to Android Development, Mark L. Murphy, Commonsware

Course Outcomes:
Upon completion of this course, students will be able to-

1. Experiment on Integrated Development Environment for Android Application Development.
2. Design and Implement User Interfaces and Layouts of Android App.
3. Use Intents for activity and broadcasting data in Android App.
4. Design and Implement Database Application and Content Providers.

5. Experiment with Camera and Location Based service and develop Android App with Security features.