RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

CSIT-601 Software Engineering & Agile

Course Objectives:

1. This course introduces the concepts and methods required for the construction of large software intensive systems.
2. The course aims are to develop a broad understanding of the discipline of software engineering and management of software systems.

Course Outcomes:

1. Apply project management concepts and techniques to an IT project.
2. Identify issues that could lead to IT project success or failure.
3. Explain project management in terms of the software development process.
4. Describe the responsibilities of IT project managers.
5. Apply project management concepts through working in a group as team leader or active team member on an IT project.

Course Contents:

UNIT I:

Introduction, Software- problem and prospects Software development process: Software life cycle models, Open source software development, the unified process, documentation, configuration management, Safety, risk assessment.

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, design Like, Top-Down, bottom-up, team etc. techniques, User interface design, modularity Functional decomposition Data flow design, Data structure design, Object-oriented design, Design patterns implementation strategies.

UNIT IV:

Coding standard and guidelines, programming style, code sharing, code review, software components, 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:

Agile Vs Traditional SDLC Models, Phases of Agile Model, Principles of Agile model, Agile Model - Pros and Cons, , When to use the Agile Model? , Agile Testing Methods, Scrum, Product Backlog, Scrum Practices, Process flow of Scrum Methodologies, extreme Programming (XP), Phases of eXtreme programming, Crystal Methodologies, Dynamic Software Development Method (DSDM), Feature Driven Development (FDD), Lean Software Development, KANBAN, Agile metrics.

Recommended Books:

1. Schwalbe, Kathy (2016) Information Technology Project Management Edition: 8th ISBN-13: 978-1285452340, ISBN-10: 1285452348.
2. Software Engineering. A Practitioner's Approach by P, S. Pressman New edition McGraw.
3. Software project Management from concept to development Black Book by Kieron Conway, Dreamtech Press.
4. Software Engineering principle and practices- Deepak Jain Oxford University Press.
5. Software Engineering for students 4/e - Bell Douglas Pearson Education.
6. Software Project Management, Kelkar, PHI Learning.
7. Learning Agile: Understanding Scrum, XP, Lean, and Kanban, By Andrew Stellman, Jennifer Greene, 2015, O Reilly

List of Experiments:

1. Identifying the requirements from problem statements.
2. Modeling UML use case diagram & capturing use case scenarios.
3. E-R modeling from the problem statements.
4. Activity & state chart modeling.
5. Modeling UML class diagram & collaboration diagrams/sequence diagrams.
6. Identifying domain classes from the problem statements.
7. Modeling DFD.
8. Designing test suite.
9. Estimation of test coverage metrics & structural complexity.
10. Estimation of project metrics.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

CSIT-602 Machine Learning

Course Objectives:

To introduce students to the basic concepts and techniques of Machine Learning and to develop skills of using recent machine learning software for solving practical problems.

Course Outcomes:

1. Apply knowledge of computing and mathematics to machine learning problems, models and algorithms,
2. Analyze a problem and identify the computing requirements appropriate for its solution;
3. Design, implement, and evaluate an algorithm to meet desired needs.
4. Apply mathematical foundations, algorithmic principles, and computer science theory to the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.

Course Contents:

UNIT I:
Introduction to machine learning, scope and limitations, regression, probability, statistics and linear algebra for machine learning, convex optimization, data visualization, hypothesis function and testing, data distributions, data preprocessing, data augmentation, normalizing data sets, machine learning models, supervised and unsupervised learning.

UNIT II:
Linearity vs non linearity, activation functions like sigmoid, ReLU, etc., weights and bias, loss function, gradient descent, multilayer network, back propagation, weight initialization, training, testing, unstable gradient problem, auto encoders, batch normalization, dropout, L1 and L2 regularization, momentum, tuning hyper parameters.

UNIT III:
Convolution neural network, flattening, sub sampling, padding, stride, convolution layer, pooling layer, loss layer, dance layer 1x1 convolution, inception network, input channels, transfer learning, one shot learning, dimension reductions, implementation of CNN like tensor flow, keras etc.

UNIT IV:

Recurrent neural network, Long short-term memory, gated recurrent unit, translation, beam search and width, Bleu score, attention model, Reinforcement Learning, RL-framework, MDP, Bellman equations, Value Iteration and Policy Iteration, , Actor-critic model, Q-learning, SARSA.

UNIT V:

Support Vector Machines, Bayesian learning, application of machine learning in computer vision, speech processing, natural language processing etc, Case Study: ImageNet Competition.

Recommended Books:

1. Christopher M. Bishop, "Pattern Recognition and Machine Learning", Springer-Verlag New York Inc., 2nd Edition, 2011.
2. Tom M. Mitchell, "Machine Learning", McGraw Hill Education, First edition, 2017.
3. Ian Goodfellow and Yoshua Bengio and Aaron Courville, "Deep Learning", MIT Press, 2016.
4. Aurelien Geon, "Hands-On Machine Learning with Scikit-Learn and Tensorflow: Concepts, Tools, and Techniques to Build Intelligent Systems", Shroff/O'Reilly; First edition (2017).
5. Francois Chollet, "Deep Learning with Python", Manning Publications, 1 edition (10 January 2018).
6. Andreas Muller, "Introduction to Machine Learning with Python: A Guide for Data Scientists", Shroff/O'Reilly; First edition (2016).
7. Russell, S. and Norvig, N. "Artificial Intelligence: A Modern Approach", Prentice Hall Series in Artificial Intelligence. 2003.

List of Experiments:

1. How to setup a python environment for Machine Learning & Deep Learning with Anaconda.
2. Program to implement linear algebra (like Matrix multiplication, transposition etc.).
3. Write a program to implement linear regression.
4. Write a program to build ANN by implementing Back-propagation algorithm using some dataset.
5. Write a program to implement Neural Network in python with step by step.
6. Write a program to construct a Bayesian Network considering Medical data.
7. Write a program to implement Support vector machine.
8. Write a program to implement K-Means.
9. Write a program to implement Principal Component Analysis.
10. Write a program to implement of Dimensionality Reduction.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

Departmental Elective CSIT- 603 (A) Wireless and Mobile Computing

Course Objectives:

To explain the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks. To enable students to compare and contrast multiple division techniques, mobile communication systems, and existing wireless networks.

Course Outcomes:

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.

Course Contents:

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.

Recommended Books:

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.
6. Stojmenic Ivan, Handbook of Wireless Networks and Mobile Computing, John Wiley and Sons Inc 2002.
7. Yi Bing Lin and Imrich Chlamtac, Wireless and Mobile Network Architectures, John Wiley and Sons Inc 2000
8. Pandya .aj, Mobile and Personal Communications Systems and Services, PHI 2004.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

Departmental Elective CSIT- 603 (B) 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.

Course Outcomes:

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.

Course Contents:

UNIT I:

Introduction to Raster scan displays, Storage tube displays, Pixel, refreshing, flickering, interlacing, colour monitors, working of different types of 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, Bezier 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, 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.

Recommended Books:

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.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

Departmental Elective CSIT- 603 (C) Advanced Computer Architecture (ACA)

Objectives

This subject aims to provide students with a fundamental knowledge of computer hardware and computer systems, with an emphasis on system design and performance. The module concentrates on the principles underlying systems organization, issues in computer system design, and contrasting implementations of modern system

Course Outcomes:

1. Discuss the classes of computers, and new trends and developments in computer architecture.
2. Study advanced performance enhancement techniques such as pipelines, dynamic scheduling branch predictions, caches.
3. Compare and contrast the modern computer architectures such as RISC, Scalar, and multi CPU systems.
4. Critically evaluate the performance of different CPU architecture.
5. Improve the performance of applications running on different CPU architectures.
6. Develop applications for high performance computing systems.

Course Contents:

UNIT I:

Flynn's Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and multicomputers, Multivector and SIMD Computers. Data and resource dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks.

UNIT II:

Instruction set architecture, CISC Scalar Processors, RISC Scalar Processors, VLIW architecture, Memory Hierarchy, Inclusion, Coherence and Locality, Memory capacity planning. Interleaved memory organization-memory interleaving, pipelined memory access, Bandwidth and Fault Tolerance. Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt.

UNIT III:

Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling - score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscalar pipeline design, Super pipeline processor design.

UNIT IV:

Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel. Vector Processing Principles, Vector instruction types, Vector-access memory schemes. Vector supercomputer architecture, SIMD organization: distributed memory model and shared memory model. Principles of Multithreading: Multithreading Issues and Solutions, Multiple-Context Processors.

UNIT V:

Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data-Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Tools and Environments.

Recommended Books:

1. Kai Hwang, "Advanced computer architecture", TMH.
2. J.P.Hayes, "computer Architecture and organization"; MGH.
3. V.Rajaranam & C.S.R.Murthy, "Parallel computer"; PHI Learning.
4. Kain,"Advance Computer Architecture: -A System Design Approach", PHI Learning.
5. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design"; Narosa Publishing.
6. Hwang and Briggs, "Computer Architecture and Parallel Processing"; MGH.
7. David E. Callav & Jaswinder Pal Singh Marge Kaufmann",Advance Computer Architecture", EIS India.
8. Sajjan G. Shiva, Taylar & Francis, "Advance Computer Architecture.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

Open Elective CSIT- 604 (A) Cryptography and Network Security

Course Objectives:

This Course focuses towards the introduction of network security using various cryptographic algorithms. It also focuses on the practical applications that have been implemented and are in use to provide email and web security.

Course Outcomes:

1. Analyze and evaluate the cyber security needs of an organization.
2. Analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
3. Measure the performance and troubleshoot cyber security systems.
4. Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
5. Design and develop security architecture for an organization.
6. Design operational and strategic cyber security strategies and policies.

Course Contents:

UNIT I:

Introduction to Network Security, Computer Securit y and Cyber Security. Security Terminologies and Principle, Security Threats, Types of attacks (Operating System, application level, Shrink Wrap code, Misconfiguration attacks etc.). Introduction to Intrusion, Terminologies, Intrusion Detection System (IDS), Types of Intrusion Detection Systems, System Integrity Verifiers (SIVS).Indication of Intrusion: System Indications, File System Indications Network Indications. Intrusion Detection Tools ,Post attack IDS Measures & Evading IDS Systems. Penetration Testing, Categories of security assessments, Vulnerability Assessment, Types of Penetration Testing. Risk Management.

UNIT II:

Cryptography, Classical Cryptographic Techniques, Encryption, Decryption, Code Breaking: Methodologies, Cryptanalysis, Cryptography Attacks, Brute-Force Attack, Use of Cryptography. Public key cryptography, Principles of Public key Cryptosystems, Cryptographic Algorithms RSA, Data Encryption Standard (DES), RC4, RC5, RC6, Blowfish, Key Management, Diffie- Hellman key exchange, elliptic curve cryptography.

UNIT III:

Hash Functions, One-way Hash Functions, SHA (Secure Hash Algorithm), Authentication Requirements, Authentication Functions, Kerberos. Message Authentication codes, Message Digest Functions, MD5, SSL (Secure Sockets Layer), SSH (Secure Shell), Algorithms and Security, Disk Encryption, Government Access to Keys (GAK) Digital Signature: Analysis, Components, Method, Applications, Standard, Algorithm: Signature Generation/Verification, ECDSA, EIgamal Signature Scheme, Digital Certificates.

UNIT IV:

Trojans and Backdoors: Overt and Covert Channels, Working, Types (Remote Access Trojans, Data-Sending Trojans, Destructive Trojans, Trojans, Proxy Trojans, FTP Trojans, Security Software Disablers). **Viruses and Worms:** Characteristics, Working, Infection Phase, Attack Phase. Sniffers: Definition, spoofing, Sniffing, Vulnerable Protocols, Types.**Phishing:** Methods, Process, Attacks Types (Man-in-the-Middle Attacks, URL Obfuscation Attacks, Hidden Attacks, Client-side Vulnerabilities, Deceptive Phishing, Malware-Based Phishing, DNS Based Phishing, Content-Injection Phishing, Search Engine Phishing). **Web Application Security-** Secured authentication mechanism, secured session management, Cross-site Scripting, SQL Injection and other vulnerabilities **Denial-of Service Attacks:** Types of Attacks (Smurf Attack, Buffer Overflow Attack, Ping of Death Attack, Teardrop Attack, SYN Attack, SYN Flooding), DDoS Attack(Distributed DoS Attack.), Session Hijacking, Spoofing v Hijacking, TCP/IP hijacking, CAPTCHA Protection.

UNIT V:

IP Security, Web Security, Firewalls: Types, Operation, Design Principles, Trusted Systems. Computer Forensics, Need, Objectives,Stages & Steps of Forensic Investigation in Tracking Cyber Criminals, Incident Handling. Hacking, Classes of Hacker (Black hats, grey hats, white hats, suicide hackers), Footprinting, Scanning (Types-Port, Network, Vulnerability), E-Mail Spiders, Overview of System Hacking Cycle.

Recommended Books:

1. William Stallings, “Cryptography and Network Security: Principles and Practice” Pearson Charlie Kaufman, Radia Perlman, Mike Speciner, Michael Speciner, “Network Security - Private communication in a public world” TMH
2. Fourozon, “Cryptography & Network Security” TMH.
3. Joseph Migga Kizza, Computer Network Security, Springer International Edition.
4. Atul Kahate, “Cryptography and Network Security” Mc Graw Hill
5. Carl Endorf, Eugene Schultz, Jim Mellander “Intrusion Detection & Prevension” TMH.
6. Neal, Krawetz, Introduction to Network Security,Cengage Learning.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

Open Elective CSIT- 604 (B) 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.

Course Outcomes:

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.

Course Contents:

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.

Recommended Books:

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.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

Open Elective CSIT- 604 (C) Intellectual Property Rights

Course Objective:

To enable Students to understand Primary forms of IPR, infringement of copyright and its consequences and to introduce criteria and procedure for obtaining patents.

Course Outcomes:

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. Understand the registration procedures related to IPR.
5. Have exposure to contemporary issues and enforcement policies in IPR.

Course Contents:

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 Semiconductors, 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.

Recommended Books:

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.
7. Universal's Guide to Patents Law (English) 4th Edition (Paperback, MANISH ARORA) - Publisher: Universal Law Publishing House ISBN: 9788175345836, 8175345837 Edition: 4thEdition, 2007.

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Computer Science & Information Technology, VI-Semester

CSIT-605 Programming in Python

Course Objective:

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language. Learning Outcomes: Problem solving and programming capability.

Course Outcomes:

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.

Course Contents:

UNIT I:
Introduction, History, Features, Python –Environment Setup Local Environment Setup, Getting Python, Installation of Python, Use of IDE.

UNIT II:
Python –Basic SyntaxPython 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.

UNIT III:
Python –Variables, Assigning Values to Variables, Multiple Assignment, Standard Data Types; Python Numbers, Python Strings, Python Lists, Python Tuples, Dictionary, DataType Conversion.

UNIT IV:
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.

UNIT V:

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

Recommended Books:

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;

List of Experiments:

1. Write a program for literals, constants, data type, i/o.
2. To create a program for list, tuples and dictionary.
3. To write a program to find mean, median, mode for the given set of numbers in a list.
4. To write a program to find the first n prime numbers.
5. Write a Program for checking whether the given number is an even number or not.
6. Write a program to find the square root of a number.
7. To write a program to find the exponentiation (Power of a number).
8. To write a program to print Fibonacci Series.
9. To write a program to show Inheritance.
10. To achieve functional Polymorphism.
11. Write a program to print each line of a file in reverse order.

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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, VI-Semester

CSIT-606 Android Programming

Course Objective:

The course is designed with an objective to Install and configure Android application development tools. Design and develop user Interfaces for the Android platform, Save state information across important operating system events and apply Java programming concepts to Android application development.

Course Outcomes:

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.

Course Contents:

UNIT I:

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.

UNIT II:

My First Android Application, How to setup Android Development Environment, Android development Framework - Android-SDK, Eclipse.

UNIT III:

Emulators – What is an Emulator / Android AVD, Creating & setting up custom Android emulator, Android Project Framework, My First Android Application.

UNIT IV:

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.

UNIT V:

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.

Recommended Books:

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

List of Experiments:

1. Setting up the development Environment.
2. Implement an android application that demonstrates the use of scroll view for text with HTML formatting.
3. Develop an application that uses GUI components, Font and Colors.
4. Develop an application that uses Layout Managers and event listeners.
5. Write an application that draws basic graphical primitives on the screen.
6. Develop an application that makes use of database.
7. Develop an application that makes use of RSS Feed.
8. Develop a native application that uses GPS location information.
9. Implement an application that creates an alert upon receiving a message.
10. Implement an application that implements Multi threading.
11. Implement an application that writes data to the SD card.