About us:

The Department of Computer Applications is one of the pioneering departments of the institution that offers Information Technology courses namely MCA, M.Sc in Computer Science and M.Tech in Data Analytics and one among the top five offering MCA course in the country. It is committed to impart quality education in the sub-fields of IT, a field growing in leaps and bounds.

Vision:

Towards a school of Information Science and Technology conforming to international standards

Mission:

- To offer state-of-art education in Information Science and Technology
- To provide strong theoretical foundation complemented with extensive practical training
- To inculcate value-based, socially committed professionalism to the cause of overall development of students and society

MASTER OF SCIENCE (COMPUTER SCIENCE)

Objectives of the Programme:

- To impart quality education in the field of Computer Science.
- To cater to the demands of the IT and IT enabled sectors through strong theoretical foundation with high quality teaching complemented with extensive practical training.
- To inculcate value-based, socially committed professionalism to the cause of overall development of research attitude and life-long learning.
The board of studies for Computer Applications Department includes the following members:

- **Chairman:**
  Dr. S.R. Balasundaram
  Head of the department

- **External Experts:**
  Dr. V. Ramachandran, Professor,
  Department of Information Science and Technology,
  Anna University, Chennai.
  Mr. Krishna Ramachnadran
  Principal Education & Research
  Infosys, Chennai.

- **Members:**
  1. Dr. N.P. Gopalan, Professor
  2. Dr. A.V. Reddy, Professor
  3. Dr. B. Ramadoss, Professor
  4. Dr. S. Nickolas, Professor
  5. Dr. Michael Arock, Professor
  6. Dr. P.J.A Alphonse, Professor
  7. Dr. S. Domnic, Associate Professor
  8. Dr. (Mrs) B. Janet, Assistant Professor
  9. Dr. (Mrs) S. Sangeetha, Assistant Professor
  10. Dr. (Mrs). R. Eswari, Assistant Professor
  11. Dr. U. Srinivasulu Reddy, Assistant Professor
  12. Dr. C. Sivaraj
  13. Dr. (Mrs). Adlin Suji
  14. Ms. Cynthia Devi
  15. Ms. Jenie Arock
  16. Mr. K. Vignesh
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L: LECTURE | T: TUTORIAL | P: PRACTICAL | C: CREDITS
# LIST OF ELECTIVES

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*L* = LECTURE | *T* = TUTORIAL | *P* = PRACTICAL | *C* = CREDITS
CAS761 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Objectives:

- To acquire skills in solving mathematical and logical problems.
- To comprehend mathematical principles and logic.
- To understand fundamental concepts and tools in discrete mathematics with emphasis on their applications to computer science.

Set Theory: Sets and operations, properties - power set - methods of proof - relations, graph and matrix of a relation - partial and total orders, well ordering - equivalence relations, classes and properties - functions, 1-1, onto and bijective - composition of relations and functions - inverse functions.


Graph Theory: Definitions and basic results - Representation of a graph by a matrix and adjacency list - Trees - Cycles - Properties - Paths and connectedness - Sub graphs - Graph Isomorphism - Operations on graphs - Vertex and edge cuts - Vertex and edge connectivity, Spanning Trees, Euler circuits, Hamiltonian graphs.


Sampling Distributions & Descriptive Statistics: The Central Limit Theorem, Distributions of the sample mean and the sample variance for a normal population, Sampling distributions (Chi-Square, t, F, z). Test of Hypothesis- Testing for Attributes – Mean of Normal Population – One-tailed and two-tailed tests, F-test and Chi-Square test - - Analysis of variance ANOVA – One way and two way classifications.

References:


Outcome:

Students will be able to:

- Apply the concepts of discrete mathematics in the modeling and design of computational problems.
CAS763 MULTIMEDIA COMMUNICATIONS

Objectives:
- To understand multimedia content representation and transmission
- To be familiar with existing state-of-the-art in network protocols, architectures, and applications.
- To gain comprehensive knowledge about multimedia data transmission over the network.

Introduction, multimedia information representation, multimedia applications, media types, communication modes, network types media types, communication modes, network types, multipoint conferencing, network QoS application QoS. - Multimedia Information Representation: Introduction, digital principles, text, images, audio, video.

Compression - Text And Image Compression: Introduction, compression principles, text compression, image compression. - Audio And Video Compression: Introduction, audio compression, DPCM, ADPCM, APC, LPC, video compression, video compression principles, H.261, H.263, MPEG, MPEG-1, MPEG-2, and MPEG-4

Multimedia Information Networks: Introduction, LANs, Ethernet, Token ring, Bridges, FDDI High-speed LANs, LAN protocol


Transport Protocol: Introduction, TCP/IP, TCP, UDP, RTP and RTCP.

References:


Outcomes:
Students will be able to:
- Use and apply appropriate network protocols to transmit multimedia content
CAS 765 DATA STRUCTURES AND ALGORITHMS

Objectives:

- To learn the basics of programing
- To learn basic concepts of data structures
- To design and analyse algorithms


Revisiting various operations of different data structures with time complexity analysis – Design and Analysis of Heap Sort - Quick Sort – Sorting in linear time – Radix sort – Selection in linear time.


References


Outcomes:

Students will be able to:

- Design and implement abstract data types/Data structures.
- Design and analyse algorithms
## CAS 767 DATABASE TECHNOLOGIES

### Objectives:
- To learn different database models and design of databases
- To study query languages, transaction management, indexing and hashing
- To be aware of emerging database technologies


Relational Query Languages – Relational Algebra – Tuple and domain Relational Calculus – SQL – Query processing and optimization – Transformation of relational expressions – Evaluation plans


File organization – Organization of records in files – Indexing – B tree and B+ tree index files – Static hashing – Dynamic hashing

Parallel and distributed databases – Object-based databases - Mobile databases - XML and Web databases – Intelligent databases – Mongo DB – NOSQL - PostgreSQL

### References:

### Outcomes:
Students will be able to:
- Illustrate the features of DBMS and models for designing databases
- Apply logical database design principles in solving real world problems
- Describe the nuances of data retrieval methods
- Acquire the knowledge about emerging database systems.
CAS 769 ADVANCED OPERATING SYSTEMS

Objectives:

- To understand design of an operating system and services provided by the OS.
- To understand what a process is and how processes are synchronized and scheduled.
- To acquire knowledge on different approaches to memory management
- To understand the structure and organization of the file system and disk.
- To know the concepts of distributed and Mobile operating systems


Distributed Operating Systems – Distributed system structure, Distributed file system; Mobile Operating systems

References:


Outcomes:

Students will be able to:

- Use system calls for managing processes, memory and the file system
- Be familiar with various types of operating systems including UNIX, Linux and windows.
- Explore the functionalities of distributed and Mobile operating systems.
CAS751 DATA STRUCTURES LAB

Exercises for learning basic features of C and exercises to implement various data structures for real world applications

**Course Outcomes:**

Students will be able to:

1. Write C programs for solving any problems.
2. Implement linear and nonlinear data structures to solve real-time problems
3. Perform searching and sorting techniques to different application domains
4. Implement different design strategies to solve complex problems

CAS 753 OPERATING SYSTEMS LAB – UNIX & SHELL PROGRAMMING

Exercises for learning basic features of UNIX and to solve problems using shell programming

**Course Outcomes:**

Students will be able to:

1. Work on the concepts, design, and structure of the UNIX operating system.
2. Use basic UNIX Utilities
3. Work on UNIX shell programming.
CAS762 HIGH PERFORMANCE COMPUTING

Objectives:
- To learn the fundamentals of High Performance Computing.

Modern processors-Stored-program computer architecture - General-purpose cache-based microprocessor architecture - Memory hierarchies-Multicore processors - Multithreaded processors -Vector processors

Parallel computers-Taxonomy of parallel computing -Shared-memory computers- Distributed-memory computers-Hierarchical (hybrid) systems-Networks - Basics of parallelization - Why parallelize? Parallelism-Parallel scalability

Shared-memory parallel programming with OpenMP-OpenMP - Case study: OpenMP-parallel Jacobi algorithm -Advanced OpenMP: Wavefront parallelization- Efficient OpenMP programming-Proﬁling OpenMP programs -Performance pitfalls. Case study: Parallel sparse matrix-vector multiply

Locality optimizations on ccNUMA architectures-Locality of access on ccNUMA-Case study: ccNUMA optimization of sparse MVM-Placement - ccNUMA issues with C++

Distributed-memory parallel programming with MPI-Message passing –MPI - Example: MPI parallelization of a Jacobi solver - Efficient MPI programming- Hybrid parallelization with MPI and OpenMP-Basic MPI/OpenMP programming models - MPI taxonomy of thread interoperability-Hybrid decomposition and Potential benefits and drawbacks of hybrid programming

References:

Outcomes:
Students will be able to:
- Deal with fundamental design issues in HPC
- Design parallel algorithms and handle advanced tools, techniques
CAS764 DATA MINING AND ANALYTICS

Objectives:

- To introduce the basic concepts and techniques of data mining and analytics.
- To develop skills of using recent data mining and analytics software for solving problems.
- To be aware of advanced concepts of data mining and analytics techniques and its applications in the knowledge discovery process.

Data Mining Techniques:

- Data Mining Process
  - Process with a typical set of data
- Data Analytic Techniques
  - Big Data
  - Visualization of data through data mining and analytical software.

Data Mining Methods as Tools:

- Memory-Based reasoning methods of Data Mining
- Algorithms with prototypical data based on real applications using data analytical methods.

Data Stream Mining, Mining Time Series, Text Mining, Data Stream Clustering, mining Big Data through data mining and analytical tools.

Market Basket Analysis:

- Fuzzy Data Mining approaches
- Fuzzy Decision Tree approaches

Social Computing:

- Analysis
- Graph Mining – Social Network Mining
- Web Mining – Web Usage Mining
- Privacy Preserving Data Mining

References:


Outcomes:

Students will be able to:

- Understand the concepts and algorithms of data mining and analytics.
- Apply data mining and analytic techniques for business intelligence.
- Be aware of the privacy and security issues in data mining and analytics.
CAS766 Advanced Statistical Techniques for Data Science

**Objectives:**
- To understand advanced statistical techniques
- To gain comprehensive knowledge on applications of statistical techniques for data analysis


Basic multivariate statistics: multivariate descriptive statistics, multivariate distributions (normal, etc), multivariate inferential statistic.

Multivariate data - Analysis of variance (ANOVA), Multivariate analysis of variance (MANOVA) - Case study: MANOVA

Multiple linear regression - Multiple and partial correlation - Detection of Collinearity - Stepwise regression.

Validation of model assumptions - Detection of outliers - influential observation and autocorrelation

**References:**


**Outcomes:**
*Students will be able to:*
- Apply statistical techniques for real time data analysis applications
CAS768 PROBLEM SOLVING USING Python and R

**Objectives:**

- To write simple Python programs using Python data structures.
- To develop object oriented programs in Python.
- To manipulate files using Python.
- To work on few python packages.
- To write simple R programs for statistical computing.

Problems solving fundamentals, Python: variables, expressions, statements, precedence of operators; Data structures: list, Dictionary, tuples; Lists: list slices, list methods, mutability, cloning lists, List comprehension; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; Conditional constructs; Iterative constructs. Strings: string slices, immutability, string functions and methods;

Functions: parameters, return values, local and global scope, function composition, recursion, and lambda functions;

Object orientation – Classes, Objects, methods, Operator overloading, and Inheritance. Files and exception: text files, reading and writing files, format operator; errors and exceptions, handling exceptions; creating modules and packages;

Python Modules and Packages: Python Standard Library, Numpy, Pandas, Matplotlib, GUI-Tkinter, wxWidgets ; Database- MySQLDB, Scikit-Learn, NLTK

R Programming - Control Structures - Functions - Data Manipulation - String Operations- Data Visualization – R for Statistical computing.

**References:**


**Outcomes:**

Students will be able to:

- Write programs using Python data structures.
- Develop solutions to real world problems using object oriented concepts
- Read and write data from/to files using Python.
- Make use of Python Modules and Packages to solve complex problems
- Write simple R programs for statistical computing.
CAS752  HIGH PERFORMANCE COMPUTING LAB

Exercises to implement parallel algorithms using openMP, MPI etc. with CUDA and other architectures.

Course Outcomes:
Students will be able to:
1. Investigate modern design structures of pipelined and multiprocessors systems.
2. Write algorithms using parallel programming principle.
3. Design the architecture of parallel systems.

CAS754 DBMS AND DATA MINING LAB

Exercises to construct and query databases.
Exercises to implement Data mining algorithms using ENCOG and WEKA

Course Outcome

Students will be able to:
1. Work with ETL tools
2. Demonstrate the classification, clustering and etc. in large data sets.
3. Ability to add mining algorithms as a component to the exiting tools.
4. Ability to apply mining techniques for realistic data.
Objectives:

- To comprehend basics of the internet and web terminologies.
- To introduce scripting language concepts for developing client side applications.
- To practice server side programming features – ASP.NET, PHP, JSP.
- To be familiar with database applications
- To know the usefulness of web services.

Internet and World Wide Web: Introduction to Internet, www, Internet browsers Netscape & Explorer, Introduction to Client Server Architecture/Computing, History of the web, Growth of the web, Protocols governing the web, resources of Internet, H/W & S/W requirements of Internet, Internet service providers, Internet Services, Internet Clients and Internet Servers. Concept of E-Commerce and E-governance.


Server Side Scripting: Introduction to server side scripting language, RMI, The Problem with Servelet. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat- Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging - Sharing Data Between JSP pages, Requests and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

PHP Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs.

References:


Outcomes:

Students will be able to:

- Design and develop web applications.
- Understand client and server side scripting and their applicability.
CAS773 ARTIFICIAL INTELLIGENCE

Objectives:

- To explore various AI search algorithms
- To understand fundamentals of knowledge representation
- To acquire knowledge on the basic concepts and techniques of Machine Learning.
- To gain knowledge on the applications of AI.

Philosophy of artificial intelligence, problem solving, search techniques, constraint satisfaction, and game playing - minimax, handling uncertainty: probability theory, Bayesian Networks.

Knowledge representation and reasoning: predicate logic, rule based systems, Decision tree, Semantic networks, Ontology, Basics of Semantic Web

Machine learning- Supervised learning- Regression, Classification; unsupervised learning- Clustering; Reinforcement learning.

Computational Intelligence- Fuzzy systems, Swarm intelligence, neural networks models- Learning through neural nets; Basics of Deep learning

Applications of Artificial Intelligence- Natural Language Processing, Speech recognition, Computer vision, Expert systems

References:


Outcomes:

Students will be able to:

- Know how to build simple knowledge-based systems
- Apply knowledge representation and machine learning techniques to solve real world problems
- Apply Computational Intelligence techniques to solve real-world problems
CAS 775 OBJECT ORIENTED SOFTWARE ENGINEERING

Objectives:
- To comprehend basics of the software engineering process life cycle.
- To be introduced to the object-oriented (OO) approach to software development, through OO principles.
- To be conversant with UML (Unified Modelling Language) and the benefits of visual modeling / diagramming.
- To get introduced to software engineering principles for both procedural and object oriented approaches.


References:

Outcomes:
Students will be able to:
- Practice the application principles of object-oriented software development and various CASE tools.
- Convey design decisions using UML.

CAS755  PROJECT WORK –Phase I
To explore various research papers pertaining to chosen domain and arrive at a survey.

Outcome: To publish papers in conference or a journal.

CAS757 FOSS LAB
To expose students to FOSS environment and introduce them to use and modify existing programs using open source packages/Technologies listed below:

1. Linux
2. Android/Mozilla OS
3. GIMP: GNU Image Manipulation Program
4. Apache Struts
5. PHP
6. Python
7. Ruby
8. Apache Cassandra database
9. Mongo DB, NoSQL
10. Hadoop

CAS 799 PROJECT WORK –Phase II
Internal project work 6 Months duration with submission of thesis and viva-voce examination
Outcome: To publish papers in conference or a journal.
ELECTIVES
CAS7A1 BIG DATA ANALYTICS

Objectives:
- To get introduced to big data analytics and to understand the importance of big data.
- To get introduced with different approaches of exploiting big data sources such as social media, mobile devices and sensors through understanding methodologies of analyzing big data.
- To acquire knowledge of handling unstructured and semi-structured data using NoSQL database.


Big Data Analytics: Classification, Clustering, and Mining, Information Extraction, Regression and Feature Selection, Reasoning: Logic and its Limits, Dealing with Uncertainty, Bayesian Inference, Forecasting, Neural Models, Introduction to Deep Learning.

HADOOP: History of Hadoop- The Hadoop Distributed File System – Components of Hadoop-Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS Basics- Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features

NoSQL Databases: Evolution of Document DataBases – Design and use of NoSQL Databases – Storage and Retrieval of Unstructured Data – NoSQL Applications and query options. Types of NoSQL Databases, Graph Databases – Neo4j ; Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

FRAMEWORKS: Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper - Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications ; Introduction to Tableau.

Introduction: IT revolution, digital media, relationship among people, media and information, The fundamental structure of web, Social media as a platform, the framework of media, the

References:
Outcomes
Students will be able to:

- Comprehend the concepts of big data analytics.
- Build web-intelligence applications exploiting big data using new big data platforms based on the 'map-reduce' parallel programming framework.
- Effectively use NoSQL database for storage and retrieval of big data.
CAS7A2 COMPUTATIONAL INTELLIGENCE

Objectives:
- To introduce the fundamentals of key intelligent systems technologies including neural networks, fuzzy systems, evolutionary computation and swarm intelligence
- To explain the integration of intelligent systems technologies

Introduction to Computational Intelligence - Intelligence machines - Computational Intelligence paradigms – Fuzzy logic - Fuzzy relationships - Fuzzy Sets - Operations on Fuzzy sets - Fuzzy rules - Fuzzy inference systems - Fuzzy expert systems - Applications of Fuzzy Set theory to different branches of science and engineering


Evolutionary computation – Chromosomes - Fitness functions - Selection mechanisms - Genetic algorithms - Crossover - mutation – Convergence – Applications - Genetic programming - Evolution strategies - Evolutionary neural network - Case studies


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<td>Apply intelligent systems technologies in a variety of engineering applications</td>
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<td>Model global optimization solutions for various real life problems</td>
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CAS7A3 CYBER SECURITY

Objectives:
- To study the concepts and principles of Cyber Security.
- To understand the various security threats and the ways to overcome them effectively.
- To know the effectiveness of various network and data security toolkits.


Cryptography: Classical Cryptography, Symmetric Cryptography, Public Key (Asymmetric cryptography), Modern Cryptography. Forensics: DRM technology (including watermarking and finger printing), Steganography, Biometrics


References:


Outcomes:
Students will be able to:
- Understand and anticipate cyber security issues and to suggest preventive measures.
- Design and execute penetration testing on a real computer network.
# CAS7B1 GPGPU PROGRAMMING

**Objectives:**

- To introduce the features of massively parallel programming architecture.
- To utilize massively parallel computing capability of a GPU for high performance computing requirements.
- To provide an overview of parallel design patterns.

**Introduction:**


Parallel Programming Patterns: Overview, Element Addressing - Multidimensional Kernel, Map, Gather, Scatter, Reduce, Scan, Thread Handling, Overview, Barrier Synchronization, Thread Synchronization Demo, Warp Divergence, Matrix Multiplication

CUDA Tools and APIs: Tools Overview, Using NSight Visual Studio and Eclipse, Running CUDA Apps, Debugging, Profiling, CUDA Architecture, CUDA APIs, CUDA 5.5 and 6 Features

CUDA programming: Overview, Compilation Process, Von Neumann Processor and CUDA Thread, Execution Model, First program in CUDA (Vector Addition), Location Qualifiers, Grid and Block Dimensions, Global Memory, Constant and Texture Memory, Shared Memory, Register and Local Memory, Data Movement, Error Handling, Device Introspection

Atomics: Overview, Need for Atomics, Atomic Functions, Atomic Sum, Monte Carlo Pi, Handling Events and Streams, Overview, Events, Event API, Event example, Pinned

**References:**


**Outcomes**

*Students will be able to:*

- Utilize massively parallel computing capability of a GPU.
- Solve High Performance Computing problems using GPUs.
CAS7B2 PATTERN RECOGNITION

Objectives:

- To understand the fundamental concepts related to image processing, feature extraction, pattern analysis etc.
- To apply the concepts to solve computer vision problems of different fields.

Fundamentals of Image Formation, Transformation: Orthogonal, Euclidean, Affine, Projective, etc; Fourier Transform, Convolution and Filtering, Image Enhancement-Histogram Processing

Edges - Canny, LOG, DOG; Line detectors (Hough Transform), Corners - Harris and Hessian Affine, Orientation Histogram, SIFT, SURF, HOG, GLOH, Scale-Space Analysis- Image Pyramids and Gaussian derivative filters, Gabor Filters and DWT.

Image Segmentation: Region Growing, Edge Based approaches to segmentation, Graph-Cut, Mean-Shift, MRFs, Texture Segmentation; Object detection.

Motion analysis: Background Subtraction and Modeling, Optical Flow, KLT, Spatio-Temporal Analysis, Dynamic Stereo; Motion parameter estimation.


References:


Outcomes:

Students will be able to:

- Apply fundamental algorithms in Image Processing and analyse their applicability for real time problems.
- Design solutions for various computer vision problems.
## CAS7B3 CRYPTOGRAPHY

### Objectives:
- To understand the principles of encryption algorithms: conventional and public key cryptography.
- To have a detailed knowledge about authentication, hash functions and application level security mechanisms.


Message authentication: Authentication requirements – Authentication functions – Message Authentication Codes (MAC) – Hash functions – Security of hash functions and MACs, MD5 Message Digest Algorithm.

Implementing cryptographic algorithms: Tamperproof Query strings, Hashed Passwords, Salted Passwords, Crypto Stream, Web Site Encryption, Digital Signatures - Authentication Protocols - Digital Signature Standard (DSS), Digital Certificates, Key Sizes and Storage, SSL/TSL.

### References:

### Outcomes:
Students will be able to:
- Understand fundamental techniques used in Cryptography.
- Decide upon the use of a particular cryptographic technique for a specific real time scenario.
Objectives

- To comprehend the rationale and benefits of software design patterns.
- To impart knowledge on the development of good design patterns.

Introduction: Introduction to Design Patterns, Object Oriented Analysis and Design, Types of Design Patterns, Applications of Design Patterns, Anti Patterns, Code Refactoring Techniques for design patterns

Creational Patterns: Factory Methods, Static Factory Pattern, Singleton Pattern, Abstract Factory Pattern, Object Pool Pattern, Prototype Pattern, Builder Pattern, Telescopic Constructor Pattern

Structural Patterns: Adapter Pattern, Bridge Pattern, Composite Pattern, Decorator Pattern, Façade Pattern, Flyweight Pattern, Private Class Data, Proxy Pattern

Behavioral Design Patterns - I: Chain of responsibility Pattern, Command Pattern, Interpreter Pattern, Iterator Pattern, Mediator Pattern

Behavioral Design Patterns – II: Memento Pattern, Null Object Pattern, Observer Pattern, State Pattern, Strategy Pattern, Template method, Visitor Pattern

References:


Outcomes

Students will be able to:

- Solve common problems in software design with ease.
- Represent design decisions more effectively with examples and architectural use cases.
CAS7C2  INTERNET OF THINGS

Objectives
- To understand the fundamentals of internet of things.
- To acquire skills to program the embedded devices and connecting them to the web and cloud.

Internet of things: Overview, technology of the internet of things, enchanted objects, Design principles for connected devices, Privacy, Web thinking for connected devices

Writing Code: building a program and deploying to a device, writing to Actuators, Blinking Led, Reading from Sensors, Light Switch, Voltage Reader, Device as HTTP Client, HTTP, Push Versus Pull

Pachube, Netduino, Sending HTTP Requests—The Simple Way, Sending HTTP Requests—The Efficient Way

HTTP: Device as HTTP Server, Relaying Messages to and from the Netduino, Request Handlers, Web Html, Handling Sensor Requests, Handling Actuator Requests

Going Parallel: Multithreading, Parallel Blinker, prototyping online components, using an API, from prototypes to reality, business models, ethics, privacy, disrupting control, crowdsourcing

References:

Outcomes:
Students will be able to:
- Program embedded devices.
- Program simple actuators and sensors.
- Build client programs that push sensor readings from a device to a web service.
Objectives:

- To learn the various concepts of Distributed and Cloud computing.
- To study the Architecture and service models in Cloud computing.


Cloud Programming and Software Environments – Features of Cloud and Grid Platforms – Parallel and Distributed Paradigms – Programming Support of Google App Engine – Amazon AWS and Microsoft Azure - Emerging Cloud Software Environments

References:


Outcomes:

Students will be able to:

- Be aware of the features of Cloud Computing.
- Understand several performance criteria to evaluate the quality of the cloud architecture.