


# Dr. A.P.J. Abdul Kalam University, Indore

**Grading System**

**Scheme of Examination**

**Bachelor of Engineering (Computer Science & Engineering)**

**Semester/Year: VII th sem & VIIIth sem /IV TH Year**

# Dr. A.P.J. Abdul Kalam University, Indore

**Grading System**

**Scheme of Examination**

**Bachelor of Engineering (Computer Science & Engineering)**

**SEMESTER : VII$^{TH}$ SEMESTER**

| S. No. | Subject Code | Subject Name | Maximum Marks Allotted | | | | | | Hours/Week | | | Credits | Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Theory | | | Practical | | | | | | | |
| | | | End Sem. | Mid Sem. Test | Quiz, Assignment | End Sem. | Lab Work | Assignment/ Quiz | L | T | P | | |
| 1 | CS-701T | Compiler Design | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 2 | CS-702T | Distributed System | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 3 | CS-703T | Cloud Computing | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 4 | CS-704T | Information Storage & Management | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 5 | CS-710T | Elective -I | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 6 | HU-224P | Yoga * | - | - | - | - | - | - | - | - | - | - | Qualifier* |
| 7 | CS-701P | Compiler Design | 00 | 00 | 00 | 30 | 10 | 10 | 0 | 0 | 2 | 1 | 50 |
| 8 | CS-703P | Cloud Computing | 00 | 00 | 00 | 30 | 10 | 10 | 0 | 0 | 2 | 1 | 50 |
| 9 | CS-705P | Industrial Training (4Weeks) | 00 | 00 | 00 | 30 | 10 | 10 | 0 | 0 | 2 | 1 | 50 |
| 10 | CS-706P | Major Project | 00 | 00 | 00 | 80 | 10 | 10 | 0 | 0 | 2 | 1 | 100 |
| 11 | CS-707 | Self study | 00 | 00 | 00 | 00 | 00 | 50 | 0 | 0 | 2 | 1* | 50 |
| 12 | CS-708 | Seminar /Group Discussion | 00 | 00 | 00 | 00 | 00 | 50 | 0 | 0 | 2 | 1* | 50 |
| | | | | | | | | | | | | | |
| **Total** | | | **350** | **100** | **50** | **120** | **40** | **140** | **15** | **5** | **12** | **26** | **850** |

**L : Lecture** **T: Tutorial** **P: Practical**

**Elective –I** **CS 7101 - N/W & Web Security** **CS 7102 - Simulation & Modelling**

Note:

-Minimum Strength of Ten Students is required to offer an Elective in the College in a Particular Academic Session.
-Choice of Elective Course ones made for an examination cannot be changed for future examinations
-For 'Self study', 'Seminar and Group Discussion', there will be no examination and credits will be awarded only on the basis of internal assessment.
-Yoga is just a qualifier subject which means student has to compulsorily qualify this is a mandatory requirement for the award of degree before completing the course.

# Dr. A.P.J. Abdul Kalam University, Indore

**Grading System**

**Scheme of Examination**

**Bachelor of Engineering (Computer Science & Engineering)**

**SEMESTER : VIII$^{TH}$ SEMESTER**

| S. No. | Subject Code | Subject Name | Maximum Marks Allotted | | | | | | Hours/Week | | | Credits | Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Theory | | | Practical | | | | | | | |
| | | | End Sem. | Mid Sem. Test | Quiz, Assignment | End Sem. | Lab Work | Assignment/ Quiz | L | T | P | | |
| 1 | CS-801T | Soft Computing | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 2 | CS-802T | Web Engineering | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 3 | CS-820T | Elective -II | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 4 | CS-830T | Elective -III | 70 | 20 | 10 | 00 | 00 | 00 | 3 | 1 | 0 | 4 | 100 |
| 5 | CS-801P | Soft Computing | 00 | 00 | 00 | 30 | 10 | 10 | 0 | 0 | 2 | 1 | 50 |
| 6 | CS-802P | Web Engineering | 00 | 00 | 00 | 30 | 10 | 10 | 0 | 0 | 2 | 1 | 50 |
| 7 | CS-805P | Major Project | 00 | 00 | 00 | 170 | 40 | 40 | 0 | 0 | 8 | 4 | 250 |
| 8 | CS-806 | Self study | 00 | 00 | 00 | 00 | 00 | 50 | 0 | 0 | 2 | 1* | 50 |
| 9 | CS-807 | Seminar /Group Discussion | 00 | 00 | 00 | 00 | 00 | 50 | 0 | 0 | 2 | 1* | 50 |
| | | | | | | | | | | | | | |
| **Total** | | | **280** | **80** | **40** | **230** | **60** | **160** | **12** | **4** | **16** | **24** | **850** |

**L : Lecture** **T: Tutorial** **P: Practical**

**Note:**

| | | | |
|---|---|---|---|
| **Elective –II** | **CS8201 - N/W Management** | **CS 8202 – Cyber Security** | **CS8203 – Data Mining and Knowledge Discovery** |
| **Elective-III** | **CS8301Bioinformatics** | **CS8302 Digital image processing** | **CS8303 wireless network Web & Ontologies** |

Note:

-Minimum Strength of Ten Students is required to offer an Elective in the College in a Particular Academic Session. Choice of Elective Course once made for an examination cannot be changed for future examinations

-For 'Self study', 'Seminar and Group Discussion', there will be no examination and credits will be awarded only on the basis of internal assessment.

-Yoga is just a qualifier subject which means student has to compulsorily qualify this is a mandatory requirement for the award of degree before completing the course.

# DR. A P J ABDUL KALAM UNIVERSITY, INDORE

# SYLLABUS

*of*

## BACHELOR OF ENGINEERING

## Computer science & Engineering

## (Fourth Year, Grading System)

## (Session July- December 2017)

**College of Engineering**

**Dr. A P J Abdul Kalam University, Indore**

# DR. A P J ABDUL KALAM UNIVERSITY, INDORE

## Syllabus for Bachelor of Engineering

## Computer science & Engineering

## List of Subject (Fourth Year, Grading System)


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| 2 | CS-702T | Distributed System | 43 |
| 3 | CS-703T | Cloud Computing | 44 |
| 4 | CS-704T | Information Storage & Management | 45 |
| 5 | CS-710-1 | N/W & Web Security | 46 |
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| 7 | CS-705P | Industrial Training (2Week) | 50 |
| 8 | CS-706P | Major Project | 51 |
| 9 | HU-224P | Yoga * | 53 |
| 10 | CS-801T | Soft Computing | 54 |
| 11 | CS-802T | Web Engineering | 56 |
| 12 | CS8201T | N/W Management | 58 |
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| 14 | CS8203T | Data Mining and Knowledge Discovery | 60 |
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| | | | |

**Unit-1** Introduction to compiling & Lexical Analysis Introduction of Compiler, Major data Structure in compiler, BOOT Strapping & Porting, Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, Lexical analysis: Input buffering , Specification & Recognition of Tokens, LEX.

**Unit-2** Syntax Analysis &Syntax Directed Translation Syntax analysis: CFGs, Top down parsing, Brute force approach, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence parsing, LR parsers (SLR,LALR, LR),Parser generation.Syntax directed definitions: Construction of Syntax trees, Bottom up evaluation of S-attributed definition, L-attribute definition, Top down translation, Bottom Up evaluation of inherited attributes Recursive Evaluation, Analysis of Syntax directed definition.

**Unit-3** Type Checking & Run Time Environment Type checking: type system, specification of simple type checker, equivalence of expression, types, type conversion, overloading of functions and operations, polymorphic functions. Run time Environment: storage organization, Storage allocation strategies, parameter passing, dynamic storage allocation , Symbol table

**Unit –4** Code Generation Intermediate code generation: Declarations, Assignment statements, Boolean expressions, Case statements, Back patching, Procedure calls Code Generation: Issues in the design of code generator, Basic block and flow graphs, Register allocation and assignment, DAG representation of basic blocks, peephole optimization, generating code from DAG.

**Unit –5** Code Optimization Introduction to Code optimization: sources of optimization of basic blocks, loops in flow graphs, dead code elimination, loop optimization, Introduction to global data flow analysis, Code Improving transformations ,Data flow analysis of structure flow graph Symbolic debugging of optimized code.

**List of Experiments:**

[1]. Develop a lexical analyzer to recognize a few patterns.
[2]. Write a programme to parse using Brute force technique of Topdown parsing.
[3]. Develop LL (1) parser (Construct parse table also). Develop an operator precedence parser (Construct parse table also)
[4]. Develop a recursive descent parser
[5]. Write a program for generating for various intermediate code forms i)Three address code ii) Polish notation
[6]. Write a program to simulate Heap storage allocation strategy Generate Lexical analyzer using LEX Generate YACC specification for a few syntactic categories.
[7]. Given any intermediate code form implement code optimization techniques Study of an Object Oriented Compiler.

**References:**


[1]. A. V. Aho, R. Sethi, and J. D. Ullman. Compilers: Principles, Techniques and Tools , Pearson Education

[2]. Raghavan, Compiler Design, TMH Pub.

[3]. Louden. Compiler Construction: Principles and Practice, Cengage Learning

[4]. A. C. Holub. Compiler Design in C , Prentice-Hall Inc., 1993.

[5]. Mak, writing compiler & Interpreters, Willey Pub.

**Unit-1** Introduction to distributed systems Architecture for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System,

**Unit-2** Distributed Share Memory And Distributed File System Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Design & Implementations issues In DSM System, Structure of Share Memory Space, Consistency Model, and Thrashing. Desirable features of good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault tolerance. Naming: - Features, System Oriented Names, Object Locating Mechanism, Human Oriented Name.

**Unit-3** Inter Process Communication And Synchronization API for Internet Protocol, Data Representation & Marshaling, Group Communication, Client Server Communication, RPC- Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms:- Bully & Ring Algorithms.

**Unit-4** Distributed Scheduling And Deadlock Distributed Scheduling-Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock-Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms,

**Unit-5** Distributed Multimedia & Database system Distributed Data Base Management System(DDBMS), Types of Distributed Database, Distributed Multimedia:- Characteristics of multimedia Data, Quality of Service Managements. Case Study of Distributed System:- Amoeba, Mach, Chorus

**References:**

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

Unit-1 Introduction: Historical development ,Vision of Cloud Computing, Characteristics of cloud computing as per NIST , Cloud computing reference model ,Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments .Overview of cloud applications: ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis ,Satellite Image Processing ,CRM and ERP ,Social networking .

Unit-2 Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management. Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure.

Unit –3 Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management,Conceps of Map reduce , Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental concepts of compute ,storage, networking, desktop and application virtualization .Virtualization benefits, server virtualization, Block and file level storage virtualization Hypervisor management software, Infrastructure Requirements , Virtual LAN(VLAN) and Virtual SAN(VSAN) and their benefits .

Unit-4 Cloud Security: Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Secutity Architecture .

Unit-5 Market Based Management of Clouds , Federated Clouds/Inter Cloud: Characterization & Definition ,Cloud Federation Stack , Third Party Cloud Services . Case study : Google App Engine, Microsoft Azure , Hadoop , Amazon , Aneka

**List of Experiments:**

[1]. Installation and configuration of Hadoop/Euceliptus etc.
[2]. Service deployment & Usage over cloud.
[3]. Management of cloud resources.
[4]. Using existing cloud characteristics & Service models .
[5]. Cloud Security Management.
[6]. Performance evaluation of services over cloud

**References:**

[1]. Buyya, Selvi ," Mastering Cloud Computing ",TMH Pub
[2]. Kumar Saurabh, "Cloud Computing" , Wiley Pub
[3]. Krutz , Vines, "Cloud Security " , Wiley Pub
[4]. Velte, "Cloud Computing- A Practical Approach" ,TMH Pub
[5]. Sosinsky, " Cloud Computing" , Wiley Pub

Unit-1 Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

Unit-2 Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

Unit-3 Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparision. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Unit -4 Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

Unit-5 Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

**References:**

[1]. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.
[2]. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
[3]. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
[4]. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
[5]. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.
[6]. Saurabh , Cloud Computing : Insight into New Era I

**Unit 1** 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 2 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, DiffieHellman key exchange, elliptic curve cryptography.

Unit 3 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 4 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, DNSBased 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 5 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.

**References:**


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

Unit-1 Introduction to Modeling and Simulation Nature of Simulation. Systems , Models and Simulation, Continuous and Discrete Systems, system modeling, concept of simulation, Components of a simulation study, Principles used in modeling Static and Dynamic physical models, Static and Dynamic Mathematical models Introduction to Static and Dynamic System simulation , Advantages ,Disadvantages and pitfalls of Simulation.

Unit-2 System Simulation and Continuous System Simulation Types of System Simulation, Monte Carlo Method, Comparision of analytical and Simulation methods, Numerical Computation techniques for Continuous and Discrete Models, Distributed Lag Models, Cobweb Model. Continuous System models, Analog and Hybrid computers, DigitalAnalog Simulators, Continuous system simulation languages ,Hybrid simulation ,Real Time simulations.

Unit –3 System Dynamics & Probability concepts in Simulation Exponential growth and decay models, logistic curves ,Generalization of growth models , System dynamics diagrams, Multi segment models , Representation of Time Delays. Discrete and Continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random Numbers, Rejection Method.

Unit-4 Simulation of Queueing Systems and Discrete System Simulation Poisson arrival patterns, Exponential distribution, Service times, Normal Distribution Queuing Disciplines, Simulation of single and two server queue. Application of queuing theory in computer system. Discrete Events ,Generation of arrival patterns, Simulation programming tasks, Gathering statistics, Measuring occupancy and Utilization, Recording Distributions and Transit times .

Unit-5 Introduction to Simulation languages and Analysis of Simulation output GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements . SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements . Estimation methods , Relication of Runs, Batch Means , Regenerative techniques , Time Series Analysis , Spectral Analysis and Autoregressive Processes.

**References:**

[1]. Gorden G., System simulation, Prentice Hall.
[2]. Seila, Simulation Modeling, Cengage Learning
[3]. Law ,Simulation Modeling And Analysis, McGraw Hill
[4]. Deo, System Simulation with Digital Computer, PHI
**[5].**Harrington, Simulation Modeling methods, McGraw Hill
**[6].**Severance, " System Modeling & Simulation, Willey Pub

Marks of various components in industry should be awarded to the students, in consultations with the Training and Placement Officer/Faculty of Institute, Who must establish contact with the supervisor/Authorities of the organisation where, students have taking training to award the marks for term work and I/c of training from Industry. During training students will prepare a first draft of training report in consultation with section in-charge. After training they will prepare final draft with the help of T.P.O./Faculty of the institute. Then they will present a seminar on their training and they will face viva-voce on training in the institute.

**1.1 OBJECTIVE OF INDUSTRIAL TRAINING**

The objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved. The student should take this course as a window to the real World of Work and should try to learn as much as possible from real life experiences by involving and interacting with industry staff. Industrial training also provides an opportunity to students to select an engineering problem and possibly an industry guide for their Major Project in final semester. Industrial training of the students is essential to bridge the wide gap between the classroom and industrial environment. This will enrich their practical learning and they will be better equipped to integrate the practical experiences with the classroom learning process.

**1.2 LEARNING THROUGH INDUSTRIAL TRAINING**

During industrial training students must observe following to enrich their learning:

- Industrial environment and work culture.
- Organisational structure and inter personal communication.
- Machines/ equipment/ instruments - their working and specifications.
- Product development procedures and phases.
- Project planning, monitoring and control.
- Quality control and assurance.
- Maintenance system.
- Costing system.
- Stores and purchase systems.
- Layout of Computer/ EDP/MIS centres.
- Roles and responsibilities of different categories of personnel.
- Customer services.
- Problems related to various areas of Work etc.

Faculty and TPO are supposed to plan industrial training in such a manner that students get exposure on most of the above arena in the field (world of work). Students are supposed to acquire the knowledge on above by -

1. Observation,
2. Interaction with officials at the workplace
3. Study of Literature at the workplace (e.g. User Manual, standards, maintenance schedules, etc.)
4. "Hand's on" experience
5. Undertaking / assisting project work.
6. Solving problems at the work place.
7. Presenting a seminar.
8. Participating in-group meeting/ discussion.
9. Gathering primary and secondary data/ information through various sources, Storage, retrieval and analysis of the gathered data.
10. Assisting officials and managers in their working.
11. Undertaking a short action research work.
12. Consulting current technical journals and periodicals in the library.
13. Discussions with peers.

**1.3 GUIDANCE TO THE FACULTY/TPO FOR PLANNING AND IMPLEMENTING THE INDUSTRIAL TRAINING**

The industrial training programme, which is spread to 4 weeks' duration, has to be designed inconsultation with the authorities of the work place, keeping in view the need of the contents. Following are some of the salient points:

- Spelling out the objectives of the industrial training in behavioral terms and same is informed in advance to the 1) students, 2) authorities of the work place and 3) supervising faculty members.
- Discussing and preparing students for the training for which meetings with the students has to be planned.
- Meeting with industrial personnel and orienting them regarding the objective of the training and the expectations of the programme.
- Correspondence with the authorities of the work place. Orientation classes for students on how to make the training most beneficial - monitoring daily diary, writing weekly reports, how to interact with various categories of industrial personnel, how to behave and undertake responsibilities, how to gather information from the workplace, ethics etc.
- Guiding students to make individual plans (week wise/ day wise) to undertake industrial training
- Developing a system of maintaining training records, by teachers for every batch of students for convenient retrieval.
- Inviting industrial personnel to deliver lectures on some aspects of training.

## 1.4 ACTION PLAN FOR PLANNING STAGES AT THE INSTITUTION LEVEL

| S.No. | Activity Commencing | Week Finishing week | Remarks |
|---|---|---|---|
| 1. | Meeting with Principal | | |
| 2. | Meeting with Colleagues | | |
| 3. | Correspondence with work place(Industries concerned) | | |
| 4. | Meeting with authorities ofwork place | | |
| 5. | Orientation of students for industrial training | | |
| 6. | Scrutinizing individual training plan of students | | |
| 7. | Commencement of industrial training | | |
| 8. | First monitoring of industrial training | | |
| 9. | Second monitoring of industrial training | | |
| 10. | Finalization of Training report | | |
| 11. | Evaluation of performance at Industry level | | |
| 12. | Evaluation of industrial programme in the institution. | | |

## 1.5 INDUSTRIAL TRAINING DAILY DIARY

Name of the Trainee:……College:……
Industry/Work place:……..Week No.:……
Department/Section:……..Date:……

| Dates | Brief of observations made, work done, problem/project undertaken, discussion held,literature-consulted etc. |
|---|---|

| Sub Code : CS 706 | Sub Name : – Major Project | 1 Credit |
|---|---|---|

The Major Project Work provides students an opportunity to do something on their own and under the supervision of a guide. Each student shall work on an approved project, which may involve fabrication, design or investigation of a technical problem that may take design, experimental or analytical character or combine element of these areas. The project work involves sufficient work so that students get acquainted with different aspects of manufacture, design or analysis. The students also have to keep in mind that in final semester they would be required to implement whatever has been planned in the Major Project in this semester. It is possible that a work, which involves greater efforts and time may be taken up at this stage and finally completed in final semester, but partial completion report should be submitted in this semester and also evaluated by an external examiner. At the end of semester, all students are required to submit a synopsis.

| Sub Code: HU224P | Sub Name: Yoga (Internal Assessment) | 0 Credits |
|---|---|---|

**Objective:** To develop physical fitness and mental peace among students

**UNIT I**
YOG & PRANAYAM::Introduction, benefits of pranayam, Asan

**UNIT II**
Meditation – Agnai, Asanas, Kiriyas, Bandas, Muthras, benefits of Agnai Meditation

**UNIT III**
Benefits of santhi Meditation Kayakalpa Yoga Asanas, Kiriyas, Bandas, Muthras Meditation Santhi

**UNIT IV**
Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Muthras Benefits of Thuriyam

**UNIT V**
Meditation Thuriyam Kayakalpa Asanas, Kiriyas, Bandas, Importance of Arutkappy & muhurtas Meditation Santhi Kayakalpa Asanas, Kiriyas, Bandas, Muthras

**UNIT VI NATIONAL SPORTS ORGANISATION (NSO)**
Each student must select two of the following games and practice for two hours per week. An attendance of 80% is compulsory to earn the credits specified in the curriculum. List of games:

- Basket Ball
- Football
- Volley Ball
- Badminton
- Cricket
- Throw ball

**References**

1. Prāṇāyāma Rahasya Book by Ramdev
2. Sampoorn Yog Vidhya by Rajiv Jain Trilok
3. Light on Yoga: The Classic Guide to Yoga by the World's Foremost Authority by B.K.S. Iyengar

Unit – 1 Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing. Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Prepositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Unit – 2 Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm, Linear separability, Widrow & Hebb;s learning rule/Delta rule, ADALINE, MADALINE, AI v/s ANN. Introduction of MLP, different activation functions, Error back propagation algorithm, derivation of BBPA, momentum, limitation, characteristics and application of EBPA,

Unit – 3 Counter propagation network, architecture, functioning & characteristics of counter Propagation network, Hopfield/ Recurrent network, configuration, stability constraints, associative memory, and characteristics, limitations and applications. Hopfield v/s Boltzman machine. Adaptive Resonance Theory: Architecture, classifications, Implementation and training. Associative Memory.

Unit – 4 Fuzzy Logic: Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions, Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

Unit – 5 Genetic algorithm : Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

**References :**


[1]. S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication.

[2]. S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications

[3]. Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.

[4]. Bose, Neural Network fundamental with Graph , Algo.& Appl, TMH

[5]. Kosko: Neural Network & Fuzzy System, PHI Publication

[6]. Klir & Yuan ,Fuzzy sets & Fuzzy Logic: Theory & Appli.,PHI Pub.

**[7].**Hagen, Neural Network Design, Cengage Learning

UNIT-1 Web Engineering: Introduction, History, Evolution and Need, Time line, Motivation, Categories & Characteristics of Web Applications, Web Engineering Models, Software Engineering v/s Web Engineering. World Wide Web: Introduction to TCP/IP and WAP, DNS, Email, TelNet, HTTP and FTP. Browser and search engines: Introduction, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines. Web Servers: Introduction, Features, caching, case study-IIS, Apache.

UNIT- 2 Information Architecture: Role, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets Website Design: Development, Development phases, Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems, Good & bad web design, Process of Web Publishing. Web-site enhancement, submission of website to search engines. Web security: issues, security audit. Web effort estimation, Productivity Measurement, Quality usability and reliability. Requirements Engineering for Web Applications: Introduction, Fundamentals, Requirement Source, Type, ,Notations Tools. Principles Requirements Engineering Activities, Adapting RE Methods to Web Application.

UNIT- 3 Technologies for Web Applications I: HTML and DHTML: Introduction, Structure of documents, Elements, Linking, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML Database integration, CSS, Positioning with Style sheets, Forms Control, Form Elements. Introduction to CGI, PERL, JAVA SCRIPT, JSP, PHP, ASP & AJAX. Cookies: Creating and Reading

UNIT-4 Technologies for Web Applications II: XML: Introduction, HTML Vs XML, Validation of documents, DTD, Ways to use, XML for data files, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML, Relationship between HTML, SGML and XML, web personalization , Semantic web, Semantic Web Services, Ontology.

UNIT- 5 E- Commerce: Business Models, Infrastructure, Creating an E-commerce Web Site, Environment and Opportunities. Modes & Approaches, Marketing & Advertising Concepts. Electronic Publishing issues, approaches, legalities and technologies, Secure Web document, Digital Signatures and Firewalls, Cyber crime and laws, IT Act. Electronic Cash, Electronic Payment Systems: RTGS, NEFT, Internet Banking, Credit/Debit Card. Security: Digital Certificates & Signatures, SSL, SET, 3D Secure Protocol.

Suggested Experiments: At least ten practical experiments based on above syllabus and a mini project is desirable to be completed by a group of three that cover following.

1. HTML/ DHTML

2. PHP

3. XML

4. Java Script, CGI, PERL

5. ASP

6. Configuration of Web Servers.

**References:**


[1]. Roger S.Pressman, David Lowe, "Web Engineering", Tata Mc Graw Hill Publication, 2007
[2]. Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
[3]. Gopalan N P , Akilandeswari, "Web Technology: A Developer s Perspective" , PHI
[4]. Neil Gray, "Web server Programming" Wiley
[5]. Chris Bates, "Web Programming: Building Internet applications" Wiley
[6]. Moller, "An Introduction to XML and Web Technologies", Pearson Education New Delhi, 2009
[7]. "Web Technologies: Black Book", Kogent, Dreamtech
[8]. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
[9]. C. Xavier, "Web Technology & Design ", Tata McGraw Hill.
[10]. Ivan Bay Ross, "HTML,DHTML,Java script,Perl CGI" , BPB

Unit-1 Introduction to Network Managements, Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration. Selected Management Strategy.

Unit –2 Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View. Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface(DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents. Setting up LAN Access, SNMP Configuration.

Unit-3 Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

Unit-4 Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

Unit –5 Internet Control Message Protocols (ICMP):- Types of message, message format, error reporting, query, checksum, ICMP Package. IGMP, IGMP Message and its Operation, IGMP Package. Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package.. Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

**References:**

[1]. Forouzan, TCP/IP Protocol Suite 4th edition, TMH
[2]. J.Richard Burkey, Network Management Concept and Practice, PHI
[3]. Stevens, TCP/IP Illustrated Volume-I, Pearson
[4]. Tittel: TCP/IP, Cenage Learning
[5]. Uyless Black, TCP/IP and related protocols, McGraw Hill.
[6]. Doughals E. Comer, Internetworking with TCP/IP Vol. I, Principles, Protocols, and Architecture, Prentice Hall, India.

Unit 1 Introduction of Cyber Crime, Challenges of cyber crime, Classifications of Cybercrimes: E-Mail Spoofing, Spamming, Internet Time Theft, Salami attack/Salami Technique, Data Diddling, Web jacking, Online Frauds, Software Piracy, Computer Network Intrusions, Password Sniffing, Identity Theft, cyber terrorism, Virtual Crime , Perception of cyber criminals: hackers, insurgents and extremist group etc. Web servers hacking, session hijacking.

Unit 2 Cybercrime on Mobile and Wireless Device: Proliferation of Mobile and Wireless Devices, trends in Mobility Credit Card Frauds in Wireless Computing, Types and techniques of Credit Card Frauds, Attacks on Mobiles: Mobile Viruses, Mishing, Vishing, Smishing & Hacking Bluetooth. Web servers hacking, session hijacking.

Unit 3 Tools and Methods in Cybercrime: Proxy Servers and Anonymizers, Password Cracking, Keyloggers and Spyware, virus and worms, Trojan Horses, Backdoors, DoS and DDoS Attacks , Buffer and Overflow, Attack on Wireless Networks, Phishing : Method of Phishing, Phishing Techniques.

Unit 4 Cyber Crime and Criminal justice: Concept of Cyber Crime and the IT Act, 2000, Hacking, Teenage Web Vandals, Cyber Fraud and Cheating, Defamation, Harassment and E-mail Abuse, Other IT Act Offences, Monetary Penalties, jurisdiction and Cyber Crimes, Nature of Criminality, Strategies to tackle Cyber Crime and Trends. The Indian Evidence Act of 1872 v. Information Technology Act, 2000: Status of Electronic Records as Evidence, Proof and Management of Electronic Records; Relevancy, Admissibility and Probative Value of E-Evidence, Proving Digital Signatures, Proof of Electronic Agreements, Proving Electronic Messages.

Unit 5 Introduction to Cyber Forensics: Information Security Investigations, Corporate Cyber Forensics, Scientific Method in Forensic analysis, investigating large scale Data breach cases. Analyzing Malicious software. Types of Computer Forensics Technology, Types of Business Computer Forensic Technology, Specialized Forensics Techniques.

**References**

[1]. Principles of Cyber crime, Jonathan Clough Cambridge University Press
[2]. John R. Vacca, Computer Forensics:Computer Crime Scene Investigation, 2nd Edition, CharlesRiver Media, 2005
[3]. Cyber Law Simplified, Vivek Sood, Pub: TMH.
[4]. Cyber Security by Nina Godbole, Sunit Belapure Pub: Willey-India
[5]. Information Warfare : Corporate attack and defense in digital world, William Hutchinson, Mathew Warren, Elsevier.
[6]. Cyber Laws and IT Protection, Harish Chander, Pub:PHI.

Unit-1 Introduction, to Data warehousing, needs for developing data Warehouse, Data warehouse systems and its Components, Design of Data Warehouse, Dimension and Measures, Data Marts:-Dependent Data Marts, Independents Data Marts & Distributed Data Marts, Conceptual Modeling of Data Warehouses:-Star Schema, Snowflake Schema, Fact Constellations. Multidimensional Data Model & Aggregates.

Unit-2 OLAP, Characteristics of OLAP System, Motivation for using OLAP, Multidimensional View and Data Cube, Data Cube Implementations, Data Cube Operations, Guidelines for OLAP Implementation, Difference between OLAP & OLTP, OLAP Servers:-ROLAP, MOLAP, HOLAP Queries.

UNIT-3 Introduction to Data Mining, Knowledge Discovery, Data Mining Functionalities, Data Mining System categorization and its Issues. Data Processing :- Data Cleaning, Data Integration and Transformation. Data Reduction, Data Mining Statistics. Guidelines for Successful Data Mining.

Unit-4 Association Rule Mining:-Introduction, Basic, The Task and a Naïve Algorithm, Apriori Algorithms, Improving the efficiency of the Apriori Algorithm, Apriori-Tid, Direct Hasing and Pruning(DHP),Dynamic Itemset Counting (DIC), Mining Frequent Patterns without Candidate Generation(FP-Growth),Performance Evaluation of Algorithms,.

Unit-5 Classification:-Introduction, Decision Tree, The Tree Induction Algorithm, Split Algorithms Based on Information Theory, Split Algorithm Based on the Gini Index, Overfitting and Pruning, Decision Trees Rules, Naïve Bayes Method. Cluster Analysis:-Introduction, Desired Features of Cluster Analysis, Types of Cluster Analysis Methods:-Partitional Methods, Hierarchical Methods, Density- Based Methods, Dealing with Large Databases. Quality and Validity of Cluster Analysis Methods.

**References:**

[1]. Berson: Data Warehousing & Data Mining &OLAP , TMH
[2]. Jiawei Han and Micheline Kamber, Data Mining Concepts & Techniques, Elsevier Pub.
[3]. Arun.K.Pujari, Data Mining Techniques, University Press.
[4]. N.P Gopalan: Data Mining Technique & Trend, PHI
[5]. Hand, Mannila & Smith: Principle of Data Mining, PHI
[6]. Tan, Introduction to Data Mining, Pearson Pub.

Unit-1 Introduction Introduction to bioinformatics, objectives of bioinformatics, Basic chemistry of nucleic acids, structure of DNA & RNA, Genes, structure of bacterial chromosome, cloning methodology, Data maintenance and Integrity Tasks.

Unit-2 Bioinformatics Databases & Image Processing Types of databases, Nucleotide sequence databases, Protein sequence databases, Protein structure databases, Normalization, Data cleaning and transformation, Protein folding, protein function, protein purification and characterization, Introduction to Java clients, CORBA, Using MYSQL, Feature Extraction.

Unit-3 Sequence Alignment and database searching Introduction to sequence analysis, Models for sequence analysis, Methods of optimal alignment, Tools for sequence alignment, Dynamics Programming, Heuristic Methods, Multiple sequence Alignment

Unit-4 Gene Finding and Expression Cracking the Genome, Biological decoder ring, finding genes through mathematics & learning, Genes prediction tools, Gene Mapping, Application of Mapping, Modes of Gene Expression data, Mining the Gene Expression Data

Unit-5 Proteomics & Problem solving in Bioinformatics Proteome analysis, tools for proteome analysis, Genetic networks, Network properties and analysis, complete pathway simulation: E-cell, Genomic analysis for DNA & Protein sequences , Strategies and options for similarity search , flowcharts for protein structure prediction .

**References:**

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

Unit-1 Digital Image fundamentals, A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images

Unit-2 Image transformations, Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.

Unit-3 Image enhancement, Filters in spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.

Unit-4 Image encoding and segmentation, Encoding: Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes. JPEG Compression standard. Detection of discontinuation by point detection, Line detection, edge detection, Edge linking and boundary detection, Local analysis, Global processing via Hough transforms and graph theoretic techniques

Unit-5 Mathematical morphology- Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation

**References:**

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

Unit 1 Introduction of Wireless Networks, Different Generations of Wireless Networks. Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modelling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modelling Techniques.

Unit 2 Network Planning: Introduction, Wireless Network Topologies, Cellular Topology, Cell Fundamentals, Signal to Interferences Radio Calculations, Network Planning for CDMA Systems. Wireless Network Operations: Mobility Management, Radio Resources and Power Management

Unit 3 Multiple Division Techniques: FDMA, TDMA, CDMA, OFDM, SDMA. Comparison of Multiple Division Techniques, Modulation Techniques – AM, FM, FSK, PSK, QPSK, QAM, 16QAM Mobile Data Networks: Introduction, Data Oriented CDPD Network, GPRS, EDGE and High Data Rates, SMS in GSM, Mobile Application Protocols.

Unit 4 Introduction to Wireless LAN, Evolution of WLAN, Wireless Home Networking, Technologies for Home Area Network (HAN), Overview of IEEE 802.11, Reference Architecture, PHY and MAC Layer, Wireless ATM, HIPERLAN.

UNIT 5 IEEE 802.15 WPAN, HomeRF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2.5 G and 3 G Networks.

**References**

[1]. Kaveh Pahlavan, Prashant Krishnamurthy “principles of Wireless Networks”, PHI.
[2]. Qing- An Zeng, Dharma Prakash Agrawal “Introduction to Wireless and Mobile Systems” CENGAGE Learning.
[3]. Sumit Kasera, Nishit Narang, A P Priyanka “2.5 G Mobile Networks: GPRS and EDGE”, TMH
[4]. Dr. KAMILO FEHER “Wireless Digital Communications” , PHI
[5]. Jochen Schiller “ Mobile Communications”, PEARSON

**Sub Code : CS805 Sub Name : –Major Project 4 Credits**

The objectives of the course 'Major Project' are

- To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
- To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
- To give students an opportunity to do some thing creative and to assimilate real life work situation in institution.
- To adapt students for latest developments and to handle independently new situations.
- To develop good expressions power and presentation abilities in students.

The focus of the Major Project is on preparing a working system or some design or understanding of a complex system using system analysis tools and submit it the same in the form of a write-up i.e. detail project report. The student should select some real life problems for their project and maintain proper documentation of different stages of project such as need analysis, market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan. Each student is required to prepare a project report and present the same at the final examination with a demonstration of the working system (if any).

The faculty and student should work according to following schedule:

i) Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff.

ii) The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.

iii) At all the steps of the project, students must submit a written report of the same.

**Objective of Self study and seminar:**

Objective of Self study and seminar is to improve the MASS COMMUNICATION and CONVINCING/ Understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

**Evaluation** will be done by assigned faculty based on group discussion and power point Presentation.