**HU501: INDUSTRIAL MANAGEMENT AND ENTREPRENEURSHIP**

**Credits: 03**

**L-T-P: 3-0-0**

**Unit-I**

Meaning and Concept of Management, Principles and function of Management, Concept of Organizational Behaviour, Function of a Manager—Planning, Organizing, Coordinating and Controlling.Motivation—implication of Managers and application.

Leadership and Decision Making : Qualities and Styles of Leadership, Decision making process.

**Unit-II**

Individual Process in Organizations-Perception, attitude and personality, Factors that affect them, How they influence people.Group Process in Organizations, Group formation, Group effectiveness, Group Conflict.

**Unit-III**

Evolution, Role and Status of Human Resource Management in India.Recruitment and Selection Process in Organization, Job Analysis, Job Specification, Selection Process-Test and Interview. Trade Union and Collective Bargaining

**Unit-IV**

Entrepreneurship-Meaning, Types of entrepreneur, Qualities of an entrepreneur, Role of Entrepreneur, Factors affecting entrepreneurial growth. Entrepreneurship Development Programme-Concept, Objective and Importance, Engineer Entrepreneurship Training Programme Scheme

**Unit-V**

Small Scale Industry-Definition, Types of Small Scale Industry, How to Set up Small Scale Industry, Role and Problem of Small Scale Industry.Concept of Joint Stock Company, Private and Public Limited Company.Source of Finance for Entrepreneur-Bank, Government and Financial Institutions etc.

**Text Books/Reference Books:**

1. S.S. Khanka-**OrganisationalBehaviour.**
2. S.S. Sarkar, R.K.Sharma and S.K.Gupta – **Business Organisation and Entrepreneurship Development.**
3. Cynthia L. Greene – **Entrepreneurship***.*

**IE501: MICROPROCESSORS AND MICROCONTROLLERS**

**Credits: 04**

**L-T-P: 3-1-0**

**Unit I**

*Architecture of Microprocessors*:

General definitions of mini computers, microprocessors, micro controllers and digital signal processors. Overview of 8085 microprocessor.Overview of 8086 microprocessor. Signals and pins of 8086 microprocessor

**Unit II**

Assembly language of 8086: Description of Instructions. Assembly directives. Assembly software programs with algorithms

**Unit III**

Interfacing with 8086: Interfacing with RAMs, ROMs along with the explanation of timing diagrams. Interfacing with peripheral ICs like 8255, 8254, 8279, 8259, 8259 etc.Interfacing with key boards, LEDs, LCDs, ADCs, and DACs etc.

**Unit IV**

Coprocessor 8087: Architecture of 8087, interfacing with 8086. Data types, instructions and programming

**Unit V**

Architecture of Micro controllers: Overview of the architecture of 8051 microcontroller. Overview of the architecture of 8096 16 bit microcontroller.

**Unit VI**

Assembly language of 8051: Description of Instructions. Assembly directives. Assembly software programs with Algorithms.

**Unit VII**

Interfacing with 8051: Interfacing with keyboards, LEDs, 7 segment LEDs, LCDs, Interfacing with ADCs. Interfacing with DACs, etc.

**Unit VIII**

High end processors: Introduction to 80386 and 80486

 **Text Books/Reference Books**

1.Ramesh S.Gaonkar, “**Microprocessor - Architecture, Programming and Applications with the 8085**”, Penram International publishing private limited, fifth edition.
2. A.K. Ray &K.M.Bhurchandi, “**Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing**”, TMH, 2002 reprint.

3. Douglas V.Hall, “**Microprocessors and Interfacing: Programming and Hardware**”, TMH, Third edition.

4. Yu-cheng Liu, Glenn A.Gibson, “**Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design**”, PHI 2003.

5. Mohamed Ali Mazidi, Janice GillispieMazidi, “**The 8051 microcontroller and embedded systems**”, Pearson education, 2004.

**IT501: Java Programming**

**Credits:04**

**L-T-P:3-1-0**

**Unit I:**

An Overview of Java: Java Virtual Machine, Data Types, Variables, Arrays, Operators, Control Statements, Java Strings.

**Unit II:**

Object Oriented Programming: (Introduction and example) Classes and Objects, Constructors, Data Abstraction and Encapsulation, Inheritance, Polymorphism, Abstract Class, Packages and Interfaces, Exception Handling.

**Unit III:**

 IO package, Input streams, Output streams, Sample programs on IO files.

**Unit IV:**

The Java GUI Components: An AWT Applet way: Applets, Basic applet life cycle, AWT components, Layout Managers, Containers, Event Driven Programming.

GUI Programming using Swing: Swing Packages, Components, Containers, Event Handling.

**Unit V:**

Accessing Databases with JDBC: Connecting to and Querying a database (MySQL and Oracle) using JDBC, Pure Java Database Java DB.

**Unit VI:**

Multithreading: Thread States: Life cycle, Priorities and Scheduling, Creating and executing threads, Thread Synchronization, Multithreading with GUI.

**Unit VII:**

Networking: Networking Basics: Overview of Sockets, Client/Server Interaction with Socket Connections.

**Unit VIII:**

Servlets: Introduction, Overview of Tomcat Webserver, The basic Servlet Architecture: Servlet request and response model, The servlet life cycle; The role of form Data: Reading form data from servlets; Session tracking in servlets.

**Unit IX:**

 Java in handset- J2ME, Types of Configurations, Profiles, J2ME API, RMS basics and Data Storage Model, J2EE Overview.

**TEXT / REFERENCE BOOKS :**

1. [Paul Deitel](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_1?_encoding=UTF8&field-author=Paul%20Deitel&ie=UTF8&search-alias=books&sort=relevancerank), [Harvey Deitel](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_2?_encoding=UTF8&field-author=Harvey%20Deitel&ie=UTF8&search-alias=books&sort=relevancerank)**,**“**Java How to Program**”, Prentice Hall, 9th Edition.
2. Bruce Eckel, “**Thinking In Java**”, 4th Edition, Pearson Education India
3. [Herbert Schildt](http://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Herbert+Schildt%22),**“Java The Complete Reference**”, 7th Edition, McGraw-Hill Companies
4. Rogers Cadenhead, “**Sams Teach Yourself Java in 24 Hours (Covering Java 7 and Android)**”, 6th Edition
5. [Cay S. Horstmann](http://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Cay+S.+Horstmann%22), [Gary Cornell](http://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Gary+Cornell%22), “**Core Java 2 Vol. 1. Fundamentals**”, Prentice Hall Professional
6. Sing Li, Jonathan Knudsen, “**Beginning J2ME: From Novice to Professional**”, 3rd Edition, APress
7. James L Weaver, [Kevin Mukhar](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_2?_encoding=UTF8&field-author=Kevin%20Mukhar&ie=UTF8&search-alias=books&sort=relevancerank), [James P. Crume](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_3?_encoding=UTF8&field-author=James%20P.%20Crume&ie=UTF8&search-alias=books&sort=relevancerank), [Ivor Horton](http://www.amazon.com/s/ref%3Dntt_athr_dp_sr_4?_encoding=UTF8&field-author=Ivor%20Horton&ie=UTF8&search-alias=books&sort=relevancerank)**,** “**Beginning J2EE 1.4: From Novice to Professional**”, APress
8. [Andrea Steelman](http://www.amazon.com/Andrea-Steelman/e/B001JPA2SA/ref%3Dsr_ntt_srch_lnk_1?qid=1356680584&sr=1-1) and [Joel Murach](http://www.amazon.com/Joel-Murach/e/B001JP7JQI/ref%3Dsr_ntt_srch_lnk_1?qid=1356680584&sr=1-1) [“**Java Servlets and JSP**”, 2nd Edition](http://www.amazon.com/Murachs-Java-Servlets-JSP-2nd/dp/1890774448/ref%3Dsr_1_1?s=books&ie=UTF8&qid=1356680584&sr=1-1&keywords=servlets), Mike Murach & Associates

**IT502: OPERATING SYSTEM**

**Credits: 04**

**L-T-P: 3-1-0**

**Unit I:**

*Introduction:*

Defination of Operating system, Architecture of OS (Ex. Monolithic, Microkernel, Layered ,Exokernel), Operating system objectives and functions, Virtual Computers, Interaction of O. S. & hardware architecture, Evolution of operating systems, Batch, multiprogramming. Multitasking, Multiuser, parallel, distributed & real –time O.S, System calls

**Unit II:**

*Process Management*

Process , Process description, Process states, Process control, Threads, Processes and Threads, Uniprocessor Scheduling: Types of scheduling, Scheduling algorithms: FCFS, SJF, Priority, Round Robin, UNIX Multi-level feedback queue scheduling, Thread Scheduling, Multiprocessor Scheduling concept, Real Time Scheduling concept..

**Unit III:**

*Process Communication and Synchronization*

Concurrency:Principles of Concurrency, Mutual Exclusion H/W Support, software approaches, Semaphores and Mutex, Message Passing, Monitors, Classical Problems Of Synchronization: Readers-Writers Problem, Producer Consumer Problem, Dining Philosopher problem

Deadlock:Principles of deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, An Integrated Deadlock Strategies

**Unit IV:**

*Memory Management*

Memory Management requirements, Memory partitioning: Fixed ,dynamic, partitioning, Buddy System Memory allocation Strategies (First Fit, Best Fit, Worst Fit, Next Fit), Fragmentation, Swapping, Segmentation , Paging, Virtual Memory, Demand paging, Page Replacement Policies (FIFO, LRU, Optimal, clock) ,Thrashing, Working Set Model.

**Unit V:**

*I/O and File Management*

I/O Management and Disk Scheduling: I/O Devices, Organization of I/O functions, Operating System Design issues, I/O Buffering, Disk Scheduling (FCFS, SCAN, C-SCAN, SSTF), Disk Caches. File Management: Overview , File Organization and access , File Directories, File Sharing, Security issues, Record Blocking, Secondary Storage Management. Comparative study of Windows and UNIX file system.

**Unit VI :**

*Computer security & protection*:

Security Threats, Attacks and assets, Intruders, Malicious softwares, Protection: Protection Policy and mechanisms, Authentications: Internal Access Authorizations, Implementations

**Text Books / References:**

1. Milenkovic M., " **Operating System: Concept & Design**", McGraw Hill.

2. Tanenbaum, A.S., "**Operating System Design &Imlementation**", Prectice Hall NJ.

3. Silbersehatz A. and Peterson, J.L. "**Operating System Concepts**", Wiley.

4. Stalling, William "**Operating Systems**", Maxwell McMillan International Editions, 1992.

5.  M. J. Bach, “**The Design of The Unix Operating System**”, ISBN: 978-81-203-0516-8, PHI.

6. Charles Crowley, “**Operating Systems : A Design-oriented Approach**” ISBN: 0074635514 TMH.

**IT503: THEORY OF COMPUTATION**

**Credits: 04**

**L-T-P: 3-1-0**

**Unit I:**

*Fundamentals* **:**

Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

**Unit II:**

*Finite Automata***:**

NFA with Î transitions - Significance, acceptance of languages. Conversions andEquivalence: Equivalence between NFA with and without Î transitions, NFA to DFA conversionminimization of FSM, equivalence between two FSM’s, Finite Automata with output- Moore and Melay machines.

**Unit III:**

*Regular Languages***:**

Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

**Unit IV:**

*Grammar Formalism***:**

Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, and sentential forms.Right most and leftmost derivation of strings.

**Unit V:**

*Context Free Grammars***:**

Ambiguity in context free grammars. Minimisation of Context Free Grammars.Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

**Unit VI:**

*Push Down Automata* **:**

Push down automata, definition, model, acceptance of CFL, Acceptance byfinal state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion.(Proofs not required). Introduction to DCFL and DPDA.

**Unit VII:**

*Turing Machine* **:**

Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church’s hypothesis, counter machine, types of Turing machines (proofs not required).

**Unit VIII:**

*Computability Theory* **:**

Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

**Text Books/Refrences :**

1. **Introduction to Automata Theory Languages and Computation**. Hopcroft H.E. and Ullman J. D.Pearson Education
2. **Introduction to Computer Theory**, Daniel I.A. Cohen, John Wiley.
3. **Introduction to languages and the Theory of Computation** ,John C Martin, TMH
4. **Elements of Theory of Computation**, Lewis H.P. &Papadimition C.H. Pearson /PHI.
5. **Theory of Computer Science – Automata languages and computation** -Mishra and

 Chandrashekaran, 2nd edition, PHI

1. **Introduction to Theory of Computation** –Sipser 2nd edition Thomson

**IT504: DESIGN AND ANALYSIS OF ALGORITHMS**

**Credits: 03**

**L-T-P: 3-0-0**

**Unit I:**

*Introduction*:

Algorithm, Psuedo code for expressing algorithms, Performance Analysis-Space complexity,Time complexity,Asymptotic Notation- Big oh notation,Omega notation,Theta notation and Little oh notation,Probabilistic analysis,Amortized analysis.

**Unit II:**

*Divide and conquer*:

General method,applications-Binary search,Quick sort, Merge sort, Strassen’smatrix multiplication.

**Unit III:**

*Greedy method*:

General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

**Unit IV:**

*Dynamic Programming*:

General method, applications-Matrix chain multiplication,Optimal binary search trees,0/1 knapsack problem, All pairs shortest path problem,Travelling sales person problem, Reliability design.

**Unit V:**

*Searching and Traversal Techniques*:

Efficient non recursive binary traversal algorithms, Graph traversal- Breadth first search and Depth first search, AND/OR graphs, game tree, Bi-connected components.

**Unit VI:**

*Backtracking*:

General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

**Unit VII:**

*Branch and Bound*:

General method, applications - Travelling sales person problem,0/1 knapsack problem-LC Branch and Bound solution, FIFO Branch and Bound solution.

**Unit VIII:**

*NP-Hard and NP-Complete problems:*

Basic concepts, non deterministic algorithms, NP - Hard and NPComplete classes,Cook’s theorem.

**TEXT / REFERENCE BOOKS:**

1. **Fundamentals of Computer Algorithms**, Ellis Horowitz, SatrajSahni and S.Rajasekharam,Galgotiapublications pvt.Ltd.

2. **Introduction to Algorithms**, second edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest,andC.Stein,PHI Pvt. Ltd./ Pearson Education.

3. **Algorithm Design: Foundations,Analysis and Internet examples**, M.T.Goodrich and

R.Tomassia,Johnwiley and sons.

4. **Introduction to Design and Analysis of Algorithms A strategic approach**, R.C.T.Lee, S.S.Tseng,R.C.Chang and T.Tsai, McGraw Hill.

5. **Data structures and Algorithm Analysis in C++**, Allen Weiss, Second edition, Pearson education.

6. **Design and Analysis of algorithms**, Aho,Ullman and Hopcroft,Pearson education.

7**. Algorithms**, Richard Johnson baugh and Marcus Schaefer, Pearson Educatin