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**Dean (Academics)**



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Ref No.PTU/BOS/DA/\_\_\_\_\_

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### **The Principals**

**All Engg. Colleges affiliated to PTU**

**Subject: List of Open Electives of 6<sup>th</sup> semester for 2002 batch and onwards.**

**Dear Sir/Madam**

As per the teaching schemes of 6th semester, the students of various departments are expected to take an open elective course. To make the process of time-table and examination date sheet formulation easier, the following courses shall be available as open elective. The Colleges are expected to restrict their choice to the list below:

- |    |            |                                 |
|----|------------|---------------------------------|
| 1. | CS-312     | Computer and Society            |
| 2. | IT-310     | Operation Research              |
| 3. | CS-304     | Introduction to Business System |
| 4. | EI-304/403 | Industrial Measurement          |
| 5. | CH- 304    | Optimization Techniques         |
| 6. | ME-251     | Total Quality Management        |
| 7. | HU-251     | Human Resource Management       |

The students shall opt any of the subject other than subject of his/her own branch. The option of the elective with the list of students shall be submitted to the Dean (Examination) under intimation to this office before 31<sup>st</sup> January,2005.

This is for your information and record at your end.

**Yours sincerely**

**Dean Academics**

**Encl: The detailed contents of the above said courses.**

**Copy to: Dean (Examination) for information and record please.**

## CS - 312 COMPUTERS AND SOCIETY

L T P

3 1 -

PREREQUISITES : RDBMS-I & Computer Networks-I.

### OBJECTIVES:

To study the impact of the large scale introduction of computers on the cultural social and political environment of a country.

To discuss ethical and moral issues of concern to computer scientists and engineers.

### COURSE CONTENTS:

A survey of a variety of computer application. [15%]

Impact of introduction of computers and its impact on privacy and security [15%]

Networking of computers and its impact on privacy and security [15%]

Information integrity [10%]

Ethical issues arising out of creation of computer viruses trojan horses etc. [10%]

Intellectual property rights in relation to computer v hardware and software.[15%]

Data banks and their impact on society. [10%]

The role of computer in education. [10%]

### TEXTS / REFERENCES:

Weizenbaum, J. Computer Power and Human Reason: from judgement to Calculation. W. H. Freeman, San Francisco, 1976.

Dunlop, C., Kling , R., (Editors) Computerization and Controversy: Value Conflicts and Social Choices, Boston Academic Press, 1991

## IT-310 OPERATION RESEARCH

L T P

3 1 -

**PREREQUISITES:** Mathematics

**OBJECTIVES:**

Importance of need to take intelligent decisions is to be emphasized. Using OR major focus should be on how to model various situations in industries and solve them.

**COURSE CONTENTS:**

Introduction to OR modeling approach and various real life situations. [5%] Linear programming problems & Applications, Various components of LP problem formulation. Solving Linear Programming problem using simultaneous equations and Graphical Method Simplex method & extensions :

Sensitivity analysis

Duality theory Revised

Simplex Dual Simplex

Transportation and Assignment Problems. [30%]

Network Analysis including PERT-CPM Concepts of network the shortest path minimum spanning tree problem maximum flow problem minimum cost flow problems The network simplex method Project planning & control with PERT & CPM [20%]

Integer programming concepts, formulation solution and applications [10%]

Game Theory [10%]

Queuing Theory & Applications [10%]

Linear Goal Programming methods and applications [5%]

Simulation [10%]

**REFERENCES:**

1. Operation Research by D.S Hira.
2. Operation Research by D.S Sharma.
3. F.S Hillier & G.J. Lieberman, Introduction to OR, Mcgraw hill Int. Series 1995
4. A Ravindran, Introduction to OR. John Wiley & Sons, 1993
5. R.Kapoor, Computer Assisted Decision Models, Tata Mcgraw Hill 1991

## **CS-304 INTRODUCTION TO BUSINESS SYSTEMS**

**L T P**  
**3 1 -**

### **OBJECTIVES**

To familiarise students with basics of data processing, COBOL and data management packages. It also introduces students to basics of Software Engineering.

### **COURSE CONTENTS:**

Introduction to Business System: Data capture, Processing dissemination storage/retrieval: I/O and storage devices terminals printers and disks.

Principles of Data Processing: Data representation and file management in COBOL

Sequential indexed and relative files, User interfaces, report writer screen management.

Data Management Software: Packaged software: Word processors spread sheets, Data management packages such as DBASE and FOXPRO.

Principles of Software Engineering: Software development methodology: System analysis, DFD, ER Model design concepts software architecture file (table0 and process design issues in system implementation. Enterprise Resource Planning (ERP) management, Resource Planning (MRP-2) Software like SAP, MARCAN.

Special topics Introduction to Management Information Systems and Decision Support Systems.

### **TEXT REFERENCES:**

1. N.L.Sharda, Structured COBOL Programming with Business application, Pitamber Publishing Co., First Edition, 1990.
2. M.K.Roy and D.Ghosh Dastidar, COBOL Programming, Tata McGraw Hill 1985.
3. R.S. Pressman, Software Engineering, McGraw Hill Inc., Third Edition, 1992.

## EI-304/403 - INDUSTRIAL MEASUREMENTS

L T P

3 1 0

1. Metrology: Line & length standards, gauge blocks mechanical, optical, pneumatic and electrical comparators, interferometry and optical flats, sine bar. Review of displacement, velocity, acceleration and seismic pickups.
2. Pressure Measurement: Standards & calibration, Dead weight piston gauges & manometers, elastic transducers Bourdon tube, bellows & diaphragm, high pressure measurement, vacuum measurement-McLeod gauge, Knudsen gauge, thermal conductivity gauges, Pirani and ionization gauges.
3. Temperature Measurement: Standards & calibrations, thermal expansion methods bimetallic thermometers, filled-in systems, their errors, thermoelectric sensors, electric resistance sensors, junction semiconductor sensors, radiation pyrometry.
4. Flow Measurement: Head type, area type, positive displacement type, mass flow meters vortex type, electrical type:- Turbo magnetic, Electro magnetic, ultrasonic Hot wire anemometer, flow marker, open channel flow metering, their working principle and applications.
5. Other variable measurements: Mass weight, force, torque & shaft power measurement, level measurement, Humidity & moisture measurement.

### BOOKS RECOMMENDED:

1. Measurement System Application & Design: E.O.Forbrlin  
McGraw Hill Book Co.,
2. Instrumentation Rangan, Mani Sharma, T MH  
Devices & systems
3. A course in Mechanical A.K.Sawhney Dhanpat Rai & Sons  
Measurement &  
Instrumentation

**INTRODUCTION:** Engineering applications of optimization, Design variables, constraints, objective function, variable bounds, statement and formulation of an optimization problem, Examples of Chemical Engg. Optimization problems, classification of optimization problems, different optimization algorithms.

**OPTIMAL POINT:** Local optimal point, global optimal point and inflection point.

**SINGLE VARIABLE OPTIMIZATION TECHNIQUES:**

- Optimality criterion.
- Bracketing method (Bounding Phase Method).
- Region elimination methods (Internal halving method, Golden section search method).
- Point estimation method (successive quadratic estimation methods).
- Gradient-based methods (Newton-Raphson method, Bisection method, Secant, Cubic search method).
- Root finding using optimization techniques.

**MULTIVARIABLE OPTIMIZATION TECHNIQUES:**

- Optimality criterion
- Unidirectional search method
- Direct Search method(Hooke-Jeeves Pattern Search method, Powell's conjugate direction method)
- Gradient-based methods(Steepest descent method, Newton's method, Marquardt's methods)

**CONSTRAINED OPTIMIZATION ALGORITHMS:**

- Kuhn-Tuckerconditions.
- Transformation method (Penalty function method)
- Direct Search for constrained minimization(variable elimination method, complex search method)

**LINEAR PROGRAMMING:**

Linear programming problems, Simplex method of linear programming technique.

**TEXT BOOK:**

Optimization for Engg. Design by Kalyanmoy Deb. (PHI)

**REFERENCE BOOKS:**

1. Engg. Optimization by S.S.Rao (New Age).
2. Optimization of Chemical Processes by T.I. Edgar & D.M/ Himmalblau (McGraw Hill).
3. Process Optimization with Applications to Metallurgy & Chemical Engg. by Ray & Szekely (Wiley).
4. Optimization: Theory & Practice by Beveridge & Schechter, (McGraw Hill).
5. Numerical Methods in Engg. & Sc. by B.S. Grewal (Khanna Publishers)

## **ME-251 Total Quality management**

### **Detailed Contents**

1. Quality and Total Quality Management; Excellence in manufacturing/service, factors of excellence, relevance of TQM.
2. Concept and definition of quality; total quality control (TQC) and Total Quality Management (TQM), salient features of TQC and TQM. Total Quality Management Models, benefits of TQM.
3. Just-in-time (JIT): Definition: Elements, benefits, equipment layout for JIT system, Kanban system MRP (Material Requirement planning) vs JIT system, Waste elimination, workers involvement through JIT: JIT cause and effect chain, JIT implementation.
4. Customer: Satisfaction, data collection and complaint, redressal mechanism.
5. Planning Process: Policy development and implementation; plan formulation and implementation.
6. Process Management: Factors affecting process management, Quality function development (QFD), and quality assurance system.
7. Total Employees Involvement (TEI): Empowering employees: team building; quality circles; reward and Recognition; education and training, Suggestion schemes.
8. Problems solving Defining problem; Problem identification and solving process; QC tools.
9. Benchmarking definition, concept, process and types of benchmarking.
10. Quality Systems: Concept of quality system standards: relevance and origin of ISO 9000; Benefits; Elements of ISO 9001, ISO 9002, ISO 9003.
11. Advanced techniques of TQM: Design of experiments: failure mode effect analysis: Taguchi methods

### **BOOKS:**

1. Total Quality Management by Sunder Raju, Tata McGraw Hill
2. TQM for engineers by M.Zairi, Aditya Books
3. Total Quality Management Handbook by J.L. Hradsky MCGraw Hill
4. ISO 9000 quality System by Dalela and Saurabh, standard Publishers

## HU-251 HUMAN RESOURCE MANAGEMENT

**Introduction:** Introduction to Human Resource Management and its definition, functions of Human Resource Management & its relation to other managerial functions. Nature, Scope and Importance of Human Resource Management in Industry, Role & position of Personnel function in the organization.

**Procurement and Placement:** Need for Human Resource Planning; Process of Human Resource Planning; Methods of Recruitment; Psychological tests and interviewing; Meaning and Importance of Placement and Induction, Employment Exchanges (Compulsory Notification of vacancies) Act 1959, The Contract Labour (Regulation & Abolition) Act 1970.

**Training & Development:** Difference between training and Development; Principles of Training; Employee Development; Promotion-Merit v/s seniority Performance Appraisal, Career Development & Planning.

**Job analysis & Design:** Job Analysis: Job Description & Job Description, Job Specification.

**Job Satisfaction:** Job satisfaction and its importance; Motivation, Factors affecting motivation, introduction to Motivation Theory; Workers ' Participation, Quality of work life.

**The Compensation Function:** Basic concepts in wage administration, company's wage policy, Job Evaluation, Issues in wage administration, Bonus & Incentives, Payment of Wages Act-1936, Minimum Wages Act-1961

**Integration:** Human Relations and Industrial Relations; Difference between Human Relations and Industrial Relations, Factors required for good Human Relation Policy in Industry; Employee Employer relationship Causes and Effects of Industrial disputes; Employees Grievances & their Redressal, Administration of Discipline, Communication in organization, Absenteeism, Labour Turnover, Changing face of the Indian work force and their environment, Importance of collective Bargaining; Role of trader unions in maintaining cordial Industrial Relations.

**Maintenance:** Fringe & retirement terminal benefits, administration of welfare amenities, Meaning and Importance of Employee Safety, Accidents-Causes & their Prevention, Safety Provisions under the Factories Act 1948; Welfare of Employees and its Importance, Social security, Family Pension Scheme, ESI act 1948, Workmen's Gratuity Act 1972, Future challenges for Human Resource Management.

### Recommended Text Books:

1. T.N.Chhabra- Human Resource Management (Dhanpat Rai & Co.)

### Recommended Reference Books:

1. Lowin B. Flippo - Principles of personnel Management (Mc Graw-Hill)
2. R.C. Saxena - Labour Problems and social welfare (K.Math & Co.)
3. A Minappa and M. S. Saiyada - Personnel Management (Tata Mc. Graw-Hill)
4. C.B. Mamoria - Personnel Management (Himalaya Publishing House, Bombay)
5. T.N. Bhagotiwai - Economics of Labour and Industrial Relations (Sahitya Bhawan Agra)