IP/IE- 701 Elective –I (701 (A) – Materials Management)

Unit-1 Purchasing: Functions, objectives of material management (MM); integration concept and production control; inspection; material classification and coding; importance of writing specifications in MM; standardization and variety reduction techniques; forecasting in purchasing, material planning importance and techniques; master and material budgets; organization of purchase department, qualities of materials manager; mass production purchasing, how much to buy at one time; methods ofpurchasing, purchasing procedures, purchasing problems; vendor evaluation and rating, computerized purchasing systems, purchasing in government organizations.

Unit-2 Stores management: Introduction, objective of store keeping, stores functions, stores organization, stores systems and procedures, stores accounting and verification systems, stores location and layout, factor affecting location, centralized and decentralized storing, automated/retrieval storage.

Unit-3 Material Handling: Planning and operating principles material handling equipments and classification; belt conveyer, chain conveyers, fork lifts, over head cranes, automated material handling in modern industries.

Unit 4 Inventory models: Necessity of inventory in process and safety stock, problem of excess inventory and cycle time (=WIP/ Throughput), JIT/ lean mfg; basic EOQ/ EPQ models for constant review Q-system(S,s); periodic review, base stock P-system; service level, lead time variance and safety stock;; ABC, VED and other analysis based on shelf life, movement, size, MRP technique and calculations, lot sizing in MRP, linking MRP with JIT; evolution of MRP to ERP

Unit-5 Miscellaneous: Make or buy decisions; outsourcing benefits and risks; dependency on capacity and knowledge; modular and integral products; framework for make/ buy decision based on dependency and modular/ integral products; buyer-seller relationships in conventional and JIT purchasing; negotiations and its planning; tactics and stages in negotiations; disposal of surplus and obsolete material; performance appraisal of MM department.

References:

1. Gopalkrishnan P; Purchasing and materials management; TMH
2. Chitale AK and Gupta RC; Materials Management; PHI
3. Levi DS, ES, Kaminsky P; Designing and managing the Supply Chain; TMH
4. Vollman, Berry etal; Mfg Planning and control for SCM; TMH

IP/IE- 701 Elective –I (701 (B) – Knowledge Management)

Unit -1 KNOWLEDGE MANAGEMENT: Introduction, Understanding Knowledge and Information, Cognition and KM, Types of Knowledge, Expert Knowledge, KM Myths, KM Life Cycle, Resistance to knowledge sharing, guidelines for effective knowledge sharing.

Unit -2 KNOWLEDGE MANAGEMENT SYSTEM LIFE CYCLE: Challenges in Building KM Systems, Conventional v/s KM System Life Cycle (KMSLS), Knowledge Creation and Knowledge Architecture, Nonaka's Model of Knowledge Creation and Transformation, Knowledge Architecture.

Unit -3 CAPTURING KNOWLEDGE: Evaluating the Expert, Developing a Relationship with

Experts, Fuzzy Reasoning and the Quality of Knowledge, Knowledge Capturing Techniques, Brain Storming, Protocol Analysis, Consensus Decision Making, Repertory Grid- Concept Mapping Blackboarding.

Unit -4 KNOWLEDGE CODIFICATION: Modes of Knowledge Conversion, Converting Tacit Knowledge to Explicit, Codification Tools and Procedures, Knowledge Developer's Skill Sets, System Testing and Deployment, Knowledge Testing, Approaches to Logical Testing, User Acceptance Testing, KM System Deployment Issues, User Training, Post implementation.

Unit -5 KNOWLEDGE TRANSFER AND SHARING: Transfer Methods, Role of the Internet,Knowledge Transfer in e-world, KM System Tools, Neural Network, Association Rules, Classification Trees, Data Mining and Business Intelligence, Decision Making Architecture, Data Management, KM Protocols, Managing Knowledge Workers.
Case studies: Utilization and Application of Knowledge Management.

TEXT BOOK:

1. Elias.M. Award & Hassan M. Ghaziri – "Knowledge Management" Pearson Education 2003.

2. Davenport, T.H. & Prusak, L. "*Working Knowledge"* Boston: Harvard Business School Press. 2000.

REFERENCES:

1. Guus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel Shadbolt, Walter Van de Velde and Bob Wielinga, "Knowledge Engineering and Management", Universities Press, 2001.

2. C.W. Holsapple, "Handbooks on Knowledge Management", International Handbooks on Information Systems, Vol 1 and 2, 2003.

IP/IE- 702 Elective –II (702 (A) – Technology Management & BPR

Unit-I. Introduction to Technology Transfer: Definition, Technology and society, Definition of technology, Classifications of technology, Management of Technology (MOT), The conceptual frame work for MOT, Drivers of MOT, Significance and Scope of MOT, Role of Chief Technology Officer, Responding to Technology challenges. Technology Policy, Determinants of Nation's Capability, Role of Government, Science and Technology policy, Status of Technology in India – Future of India

Unit-II. Technology Planning and Strategy Tools: Technology Planning– Tools for Company Technology Analysis, Tools for industry Technology Analysis– Trajectories of Technology, Alliances: Formal versus Informal Alliances, Duration of an Alliance, Location: Domestic versus International Alliances Concerns in Alliances , Mergers and Acquisitions of Technology, Strategic Reasons for Mergers and Acquisitions, Types of Mergers and Acquisitions, Technology Acquisition, Methods of Acquisition, Internal Development, External acquisition Sources - Acquisition decisions.

Unit-III. Innovation Management: Definition of Innovation, Definition of Management of Innovation, The Process of Managing Innovation, Making Decisions for Managing Innovation, Tools for Managing Innovation, Process Innovations– Concept and types of process, Process Management Concerns- Types of Process innovations, Process improvement techniques, Organizing for improvements, Technology Transfer**–** Definition, Classification and Significance - Elements of transfer process - Types of Technology transfer

Unit- IV. Introduction to BPR: Conceptual Foundation of Business Process Re-engineering (BPR); Benefits & pitfalls of BPR, Role of Information Technology in BPR, Process Improvement and Process Redesign, Process Identification and Mapping, Role/Activity Diagrams, Process Visioning and Benchmarking, Business Process Improvement.

Unit- V. Business Process Redesign: Man Management for BPR Implementation; Re-organizing People and Managing Change, BPR Experiences in Indian Industry, Case studies.

TEXT BOOK:

1. Jayaraman, M S., Natarajan G., Rangaramanujan A.V.- 'Business Process Reengineering'. New Delhi, Tata Mc-Graw Hill, 1998.
2. Hammer, Michael- 'Re-engineering the Corporation: A Manifesto for Business Revolution'. London, Nicholas Brealey, 1993.
3. Khalil T., 'Management of Technology'– Tata Mc-Graw Hill,
1. Narayanan V. K., 'Managing Technology and Innovation for Competitive Advantage' Pearson Education, Asia, 2007.

REFERENCES:

1. Gaynor G.H., 'Handbook Of Technology Management', Mcgraw Hill, 1996.
2. Souder, W.C. and Crawford C.M., 'Managing New Technology Development' McGraw-Hill,

IP/IE- 702 Elective –II (702 (B) – MIS, ERP and e- Business

UNIT 1 Management Information System (MIS) definition, Objectives and benefits, MIS as strategic tool, obstacles and challenges for MIS, functional and cross functional systems, hierarchical view of CBIS, structured and unstructured decision, Operation and mgt support, Decision process and MIS, info system components and activities, Value chain and MIS support.

UNIT 2 System concepts: types, definition, characteristics, feedback (Pull) and feed-forward (Push) control, system stress and entropy, computer as closed system, law of requisite variety, open and flexible (Adaptive) systems, work system model and comparison with input-process-output model, five views of work system: structure, performance, infrastructure, context and risk and their effect on product performance.

UNIT 3 Info concepts: define data, info, knowledge, intelligence and wisdom, Information characteristics and attributes, info measurement and probability, characteristics of human as info processor.

UNIT 4 Planning and control Concepts: terminologies, difficulties in planning, system analysis and development plan-purpose and participants, info planning, (SDLC) system development life cycle for inhouse and licensed sw, system investigation, analysis of needs, design and implementation phases, training of Operational personnel, evaluation, Control and Maintenance of Information Systems.

UNIT 5 E-business components and interrelationship, Evolution of Enterprise Resource Planning (ERP) from MRP, Supply chain management (SCM) and Customer relationship management (CRM), Integrated data model, strategic and operational issues in ERP, Business Process Re-Engineering (BPR), significance and functions, information technology and computer NW support to MIS.

References

1. Davis and Olson, Management Information Systems, TMH
2. James O Brian, Management Information Systems, TMH
3. Oz, Management Information Systems, Cengage
4. Alter Stevenson, Information Systems: Foundation of E-Business; (Prentice-Hall,USA)
5. Jayaraman, Business Process Re-Engineering, TMH.
6. Garg. V.K.; ERP, PHI
7. Kelkar SA; Management Information Systems A Concise Study; PHI Learning.
8. Radhakrishnan R and Balasuramanian S; Business Process Reengineering; PHI Learning.
9. Alex Leon ; ERP, TMH
10. Jawadekar WS; MIS- text and cases; TMH
11. Jaiswal M and Mital M; MIS; Oxford higher Edu India

IE- 703 – HRM (Human Resource Management)

Unit -1.PERCEPTIVE IN HUMAN RESOURCE MANAGEMENT: Evolution of human resource management, Objectives, Importance of the human factor, of HRM, Inclusive growth and affirmative action, Role of human resource manager, Human resource policies, Computer applications in human resource management, Human resource accounting and audit.

Unit -2.THE CONCEPT OF BEST FIT EMPLOYEE: Importance of HR Planning, Forecasting HR requirement, Recruitment introduction: Importance, Practices & Socialization benefits, Internal and External sources. Selection: Process, Screening Tests - Validation – Interview – Medical examination.

Unit -3.TRAINING AND EXECUTIVE DEVELOPMENT: Types of training methods purpose benefits resistance to training, Executive development programmes: Common practices, Benefits, Self development & Knowledge management.

Unit -4.SUSTAINING EMPLOYEE INTEREST: Compensation plan, Reward, Motivation, Theories of motivation, Effective communication, Career management, Development of mentor, Human resource information system.

Unit -5.PERFORMANCE EVALUATION AND CONTROL PROCESS: Methods of performance evaluation, Feedback, Industry practices, Promotion, Demotion, Transfer and Separation– Implication of job change. The control process: Importance, Methods, Requirement of effective control systems grievances, Causes, Implications, Redressal methods.

TEXT BOOKS

1. Decenzo David D. and Robbins Stephen P., Human Resource Management, Wiley, 8th Edition, 2007.
2. Dessle r Garry, Human Resource Management, Pearson Education Limited, 2007
3. Mirza S. Sayiadain, Human Resource Management, McGraw Hill, 2008

REFERENCES

1. Mamoria C.B. and Mamoria S. Personnel Management, Himalaya Publishing Company, 2007
2.Bernadin,Human Resource Management,Tata Mcgraw Hill ,6th edition 2006.
3. Eugence Mckenna and Nic Beach, Human Resource Management, Pearson Education Limited, 2007.
4. Wayne Cascio, Managing Human Resource, McGraw Hill, 2007.

IP/IE- 704 – Industrial Robotics

Unit I Introduction: Need and importance, basic concepts, structure and classification of industrial robots, terminology of robot motion, motion characteristics, resolution, accuracy, repeatability, robot applications.

Unit II End Effectors and Drive systems: Drive systems for robots, salient features and comparison, different types of end effectors, design, applications.
Unit III Sensors: Sensor evaluation and selection Piezoelectric sensors linear position and displacement sensing, revolvers, encoders, velocity measurement, proximity, tactile, compliance and range sensing. Image Processing and object recognition.

Unit IV Robot Programming: Teaching of robots, manual, walk through, teach pendant, off line programming concepts and languages, applications.

Unit V Safety and Economy of Robots: Work cycle time analysis, economics and effectiveness of robots, safety systems and devices, concepts of testing methods and acceptance rule for industrial robots.

References:
1. Mittal RK, Nagrath IJ; Robotics and Control; TMH
2. Groover M.P,Weiss M, Nagel,OdreyNG; Industrial Robotics-The Appl; TMH
3. Groover M.P; CAM and Automation; PHI Learning
4. Spong Mark and Vidyasagar; Robot Modelling and control; Wiley India
5. Yoshikava ; Foundations of Robotics- analysis and Control; PHI Learning;
6. Murphy ; Introduction to AI Robotics; PHI Learning
7. FU KS, Gonzalez RC, Lee CSG; Robotics Control, sensing; TMH
8. Shimon, K; Handbook of Industrial Robots; John Wiley & Sons,.
9. Ghosal Ashitava; Robotics Fundamental concepts and analysis; Oxford
10. Saha S; Introduction to Robotics; TMH
11. Yu Kozyhev; Industrial Robots Handbook; MIR Pub.

List Of Experiments (Please Expand it):
1. Study of different types of robots
2. Study of different robot arm motions
3. Study of sensors used in robots
4. Experiments on robot programming
5. Modeling of robots

IP/IE- 705 – Logistics and Supply Chain Management

Unit 1 Introduction: Definition, importance, expenditure and opportunities in SCM; integration of inbound, outbound logistics and manufacturing to SCM, flow of material money and information, difficulties in SCM due to local v/s system wide (global) optimization and uncertainties in demand and transportation; Bull-whip effect; customer value; IT, info-sharing and strategic partnerships;

Unit 2 Design of Logistics & SC network: Plant and warehouse-network configuration; data collection and aggregation; transportation and mileage costs; warehouse capacity, costs and potential locations; service level requirements; variance reduction by pooling demands; cross docking and transshipments distribution. Distribution channels, elements of logistics, Integrated logistics, organizing for effective logistics lean logistics, reverse logistics, business & marketing logistics value creation in logistics.

Unit 3 Inventory models: Necessity of inventory in process and safety stock, problem of excess inventory and cycle time (=WIP/ Throughput), JIT/ lean mfg; basic EOQ/ EPQ models for constant review Q-system(S,s); periodic review, base stock P-system; service level, lead time variance and safety stock;; ABC, VED and other analysis based on shelf life, movement, size, MRP technique and calculations, lot sizing in MRP, linking MRP with JIT; evolution of MRP to ERP to SCM and e-business.

Unit 4 Strategic alliance and integration: Outsourcing benefits and risks; dependency on capacity and knowledge; modular and integral products; framework for make/ buy decision based on dependency and modular/ integral products; issues to be addressed in strategic alliance; use and merit/ demerit of third party (3PL) logistic; push, pull and push-pull based supply chains; push-pull boundary, appropriate strategy on matrix of demand uncertainty and economy of scale; coordination and leadership issues; change of purchasing role and vendor rating, variability from multiple suppliers; supply contracts and revenue sharing;

Unit 5 Role of IT: Value and impact of centralized information on Bullwhip effect; effective forecasts; locating products in SC; lead time reduction; dimensions of customer value; relationship and customer satisfaction; strategic pricing; IT infrastructure;; standardization and compatibility; interface devices, communication and databases; performance measurement in supply chain management; Decision Support Systems for SCM

References:

1. Deshmukh & Mohanty; Essentials of SCM; Jaico Publishing House
2. Levi DS & ES, Kaminsky P; Designing and Managing the Supply nChain; TMH
3. Chopra, Meindl, Kalra; Supply Chain Management; Pearson Education
4. Exploring the Supply Chain by Upendra Kachru, Excel Books
5. Supply Chain Management, by Janat Shah, Pearson Education
6. Vollman, Berry et al; Manufacturing planning and control for SCM; TMH.
7. Bowersox DJ, Closs DJ, Cooper MB; Supply Chain Logisti Mgt; TMH
8. Burt DN, Dobler DW, StarlingSL; World Class SCM; TMH

List Of Experiments (Please Expand it):

1. Case studies and problems related to the theory
2. Design of network configurations using computer

IP/IE- 706 – Minor Project

Provision of Minor project is made as preparation phase-I for major project or to take it as an independent small project. For details of project see ME-805- Major project

IP/IE- 707 – Industrial Training

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 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.

Scheme of Studies:

Duration: Minimum 2 weeks in summer break after VI semester, assessment to be done in VII semester

Scheme of Examination:

For the assessment of industrial training undertaken by the students, following components are considered with their weightage.

(a) Term Work in Industry	**Marks Allotted**
Attendance and General Discipline	5
Daily diary Maintenance	5
Initiative and participative attitude during training	10
Assessment of training by Industrial Supervisor	10
Total	30*

(b) Practical/Oral Examination (Viva-Voce) in Institution	**Marks Allotted**
1. Training Report	15
2. Seminar and cross questioning (defense)	15
Total	30

* - Marks of various components in industry should be awarded by the I/c of training in Industry but in special circumstances if not awarded by the industry then faculty in charge /T.P.O. will give the marks.

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.

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/instrument-their working and specifications.
- Product development procedure and phases.
- Project Planning, monitoring and control.
- Quality control and assurance.
- Maintenance system
- Costing system
- Stores and purchase systems.
- Layout of Computer/EDP/MIS centers.
- Roles and responsibilities of different categories of personnel.
- Customer services.
- Problems related to various areas of work etc.

Students are supposed to acquire the knowledge on above by-

- Direct Observations without disturbing personnel at work.
- Interaction with officials at the workplace in free/ tea time
- Study of Literature at the workplace (e.g. User Manual, standards, processes, schedules, etc.)
- "Hand's on" experience
- Undertaking/assisting project work.
- Solving problems at the work place.
- Presenting a seminar
- Participating in group meeting/discussion.
- Gathering primary and secondary data/information through various sources, storage, retrieval and analysis of the gathered data.
- Assisting official and managers in their working
- Undertaking a short action research work.
- Consulting current technical journals and periodicals in the library.
- Discussion with peers.

Daily Diary- Industrial Training

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.

Signature of Supervisor (TPO/Faculty)	Signature of Trainee	Signature of Official in charge for Trg. In Industry.

Supervision of Industrial Training

Faculty and TPO are supposed to plan industrial training in such a manner that students get exposure on most of the above area in the field.
One faculty member or TPO will plan industrial training of students in consultation with training manager of the industry (work place) as per the predefined objectives of training.
Monitoring visits will be made by training and placement officer/faculty in-charge for the group of students, of the college during training.

Guidance to the faculty / TPO for Planning and implementing the Industrial Training
Keeping in view the need of the contents, the industrial training program, which is spread to minimum 2 weeks duration, has to be designed in consultation with the authorities of the work place; 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 program.
- 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 form 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.

Action plan for planning stages at the Institutional Level

S.No.	Activity	Commencing Week	Finishing week	Remark
1.	Meeting with Principal			
2.	Meeting with colleagues			
3.	Correspondence with work place(Industry concerned)			
4.	Meeting with authorities of work place			
5.	Orientation of students for industry training			
6.	Scrutinizing individual training plan of students.			
7.	Commencement of individual 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 Industry Program in the Institutions.			