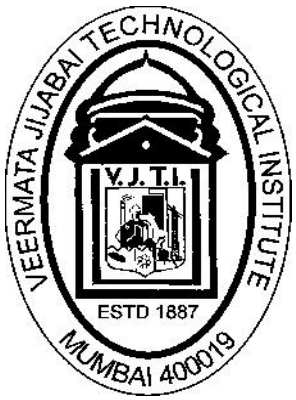
VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE

(VJTI)

MATUNGA, MUMBAI 400 019

(Autonomous Institute affiliated to University of Mumbai)



Curriculum

(Scheme of Instruction & Evaluation and Course contents)

For

Two Year Postgraduate Programme Leading to

Master of Technology (M.Tech.) Degree in

Project Management

VJTI Mumbai

Scheme of Teaching and Evaluation

M Tech. (Project Management) (Semester I)2013-14

Theory Courses										
Course Code	**Course Name**	**Hr/Week**			**Credits**	**Examination Scheme (Evaluation in % Weightage)**				
		L	T	P		TA	IST	ESE	Total	ESE (hrs)
PE0375	Principles of Project Management	3	-	2	3-0-1	20	20	60	100	3
PE0376	Elements of Industrial Engineering	3	2	-	3-1-0	20	20	60	100	3
PE0377	Public Administration	3	-	-	3-0-0	20	20	60	100	3
PE0378	Managerial Accounting, Costing & Project Finance	4	2	-	4-1-0	20	20	60	100	3
PE0379	Quantitative techniques for Project Management.	4	-	2	4-0-1	20	20	60	100	3
CC4341	Professional Communication & Ethics	-	-	2	P/NP					
CC4342	Constitution of India	-	2	-	P/NP					
	Total	17	6	6	21					

Total for Semester I	L	T	P	Total Hours	Credits
	17	6	6	29	21

Scheme of Teaching and Evaluation

M Tech. (Project Management) (Semester II)

Theory Courses										
Course Code	**Course Name**	**Hr/Week**			**Credits**	**Examination Scheme (Evaluation in % Weightage)**				
		L	T	P		TA	IST	ESE	Total	ESE (hrs)
PE0380	Research Methodology	3	2	-	3-1-0	20	20	60	100	3
PE0381	Infrastructure Management	3	-	-	3-0-0	20	20	60	100	3
CE045 7	Project Risk Management	3	2	-	3-1-0	20	20	60	100	3
PE0383	Organizational Behavior & Human Resource Management	3	-	-	3-0-0	20	20	60	100	3
	Elective-I	3	-	-	3-0-0	20	20	60	100	3
	Elective-II	3	-	-	3-0-0	20	20	60	100	3
CC4343	Intellectual Property Rights	-	2	-	P/NP	-	-	-	-	-
CC4344	Commercial Laws	-	2	-	P/NP	-	-	-	-	-
	Total	18	8	-	20	-	-	-	-	-

Total for Semester II	L	T	P	Total Hours	Credits
	18	8	0	26	20

Summer Term (Summer Vacation May-June-July)

Course Code	Course Name	Credits	Duration
PE1361	Industry/Business/Academia Internship/Minor Project Work	4	4 Weeks

Scheme of Teaching and Evaluation

M Tech (Project Management) (Semester III)

Theory Courses										
Course Code	**Course Name**	**Hr/Week**			**Credits**	**Examination Scheme (Evaluation in % Weightage)**				
		L	T	P		TA	IST	ESE	Total	ESE (hrs)
	Elective-III	3	-	-	3-0-0	20	20	60	100	3
	Elective-IV	3	-	-	3-0-0	20	20	60	100	3
PE3351	Stage –I Presentation	-	-	-	6					
	Total	6	-	-	12					

Scheme of Teaching and Evaluation

M Tech (Project Management) (Semester IV)

Course Code	Course Name	Credits
PE3352	Stage –II Presentation	6
PE3353	Presentation and Viva Voce	12
	Total	18

Elective Courses

Elective Courses for Semester II	
Course Code	**Course Name**
PE0384	Sustainable Manufacturing & Supply Chain Management Operations
PE0385	Operations Strategy
PE0386	Maintenance Engineering & Management
PE0387	Materials Management
PE0388	Managerial Economics
PE0389	Total Quality Management
PE0390	Facilities Planning & Design
PE0391	Occupational safety, health & environment
PE0321	Advanced Operations Research
PE0392	Technology Management
PE0393	Ecology and Sustainable Development

Elective Courses for Semester III	
Course Code	Course Name
CE0353	Environmental Impact Assessment & Audit
PE0394	Innovation, Entrepreneurship & Business Transformation
PE0395	Marketing Management
PE0396	MIS & Enterprise Resource Planning
PE0397	Operations Management
PE0357	World Class Manufacturing
CE0457	Disaster Management
PE 0398	Software Project Management
PE0399	International Business
CE 0451	Risk & Value Management

Abbreviations

L: Lectures, T: Tutorial, P: Practical, TA: Teacher

Assessment, IST: In Semester Test/s, MST: Mid Semester

Test,

P/NP: Pass/Not Pass

Principles of Project Management

Course Code	Theory Course Name	L	T	P	Credits	TWA	I S T	E S E	Total	ESE Hours
PE0375	Principles of Project Management	03	-	2	3-0-1	20	20	60	100	03

COURSE OBJECTIVES

- To understand the basic concepts of project management.
- Appraise the project using appropriate appraisal techniques.
- Design and implement project by considering risk and its evaluation.
- Learn the process of project planning and execution.

COURSE CONTENT

Introduction to Project Management: What is a project? Evolution of project management, the need of project management, Where is project management appropriate? Characteristics of projects, Characteristics of project management, Projects in contemporary organizations, Project life cycle.

Project Selection and Appraisal: Brainstorming and concept evolution, Project selection and evaluation, Selection criteria and models, Types of appraisals, SWOT analysis, Cash flow analysis, Payback period, and Net present value.

Project Organization and Planning: Project manager, Cross-functional team, Dedicated project organization, Influence project organization, Matrix organization, Advantages and disadvantages of project organizations, Selection of project organization, Work Breakdown Structure (WBS), Integration of project organization and WBS, WBS and responsibility matrix.

Project Scheduling and Resource Management: Gantt chart, Milestone chart, Network techniques: PERT and CPM, AON and AOA representation, Three time estimates, Using probability distributions for time computation, Probability of project completion, Time scale version of network, Early start and late start schedules, Resource allocation, Resource loading and leveling, Constrained resource scheduling, Multi-project scheduling and resource allocation, Crashing a project.

Computerized PM: Computerized PMIS, Choosing software for project management, using software for projectmanagement.

Case Studies on Project Management: Modern cases in project management.

Reference Books

1. Project Management for Business and technology: Principles and Practice, John M. Nicholas, Pearson Prentice Hall, New Delhi, 2005.

2. A Guide to the Project management Body of Knowledge (PMBOK Guide) 5th Edition, PMI.

3. Project Management-Case Studies, Harold Kerzner, John Wiley & Sons, New Jersey, 2006.

4. Project and Production Management, A course by National Programme on Technology Enhanced Learning (NPTEL), Arun Kanda and S. G. Deshmukh, IIT Delhi, 2005.

5. Projects: Preparation, Appraisal, Budgeting and Implementation, Prasanna Chandra, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1980.

Elements of Industrial Engineering

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0376	Elements of Industrial Engineering	3	2	-	3-1-0	20	20	60	100	03

COURSE OBJECTIVES

- Deepen the insights in the field of work study, ergonomics, productivity improvement techniques, quality engineering.
- Impart skills to apply techniques to enhance work environment, quality and productivity.
- Impart advanced knowledge in these areas through study of research papers to enable the students to undertake research and projects in these areas.
- Provide computational skill in using related software.

COURSE CONTENT

Fundamentals of Industrial Engg: Productivity Vs Quality, Total productivity & Quality Management, Relationship with Standard of living, Maslow's Theory of Hierarchy of needs

Method Study: Concept, significance, procedure, applications, case studies. **Work measurement**: Work sampling, Time study, MOST

Ergonomics: Concept, significance, man/machine/environment systems concept, development of ergonomics, Design approach, Controls, Work load, Climate, applications, case studies on ergonomics.

Plant Location: Concept, Significance, Factors affecting plant location, Location Economics

Plant Layout: Concept, significance, Types of Plant layout, methods for design of layouts, etc

Fundamentals of Material Handling

Advanced techniques of Industrial Engineering:- Just in Time, Concurrent Engineering, SMED, Kaizen, Business Process Reengineering, Supply Chain Management, Value Engineering, Lean Thinking, Visual Workplace, Poka-Yoke, Strategic Human Resource Management, Total Productive Maintenance

Reference Books

1. Introduction to Work Study & Ergonomics, George Kanawaty, International Labor Organization, 1992.
2. Work Study and Ergonomics, Shan H.S., Dhanpat Rai & Sons, 1999.

Public Administration

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0377	Public Administration	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- Provide understanding of administrative concept, constructs and theory, administrative thoughts, organization structure and functioning, administrative law.
- Developing insights in the functioning of public and private organizations, leadership and motivation theory for effective handling of organizations.

COURSE CONTENT

Administrative Theory

Introduction: Meaning, scope and significance of Public Administration; Evolution of the discipline and its present status; New Public Administration; Challenges of liberalization, Privatization, Globalization; Good Governance: concept and application.

Administrative Thought: -Scientific Management; Classical Theory; Weber's bureaucratic model; Human Relations School (Elton Mayo and others); Simon's decision-making theory; Participative Management (R. Likert, C. Argyris, D. McGregor).

Administrative Behaviour: -Process and techniques of decision-making, Communication; Morale; Motivation Theories — content, process and contemporary; Theories of Leadership: Traditional and Modern.

Organizations:- Theories — systems, contingency; Structure and forms: Ministries and Departments, Corporations, Companies, Boards and Commissions; Ad hoc and advisory bodies; Headquarters and Field relationships; Regulatory Authorities; Public - Private Partnerships.

Accountability and control:- Concepts of accountability and control; Legislative, Executive and Judicial control over administration; Citizen and Administration; Role of media, interest groups, voluntary organizations; Civil society; Citizen's Charters; Right to Information; Social audit.

Financial Administration: -Monetary and fiscal policies; Public borrowings and public debt Budgets - types and forms; Budgetary process; Financial accountability; Accounts and audit.

Administrative Law:- Meaning, scope and significance; Dicey on Administrative law; Delegated legislation; Administrative Tribunals.

Development Administration: -Concept of development; Regulatory and development administration; Changing profile of development administration; Bureaucracy and development; Strong state versus the market debate; Impact of liberalization on administration in developing countries;

Personnel Administration:- Recruitment, discipline, performance appraisal, promotion, pay and service conditions; employer-employee relations, grievance redressal mechanism; Code of conduct; Administrative ethics.

Public Policy:- Models of policy-making and their critique; Processes of conceptualization, planning, implementation, monitoring, evaluation and review and their limitations; State theories and public policy formulation.

Reference Books

1. Indian Administration - Ramesh K. Arora & Rajni Goyal.
2. Indian Administration - S.R. Maheswari.
3. Administrative Theory - Avasti & Avasti
4. Public Administration - Avasti & Maheswari.
5. Administrative Thinkers - S.R. Maheswari.
6. Public Administration - Sadhna and Sharma
7. New Horizons of Public Administration - Mohit Bhattacharya.
8. Public Administration Theory and concepts - Rumki Basu
9. Indian Constitution - D.D.Basu

Managerial Accounting, Costing & Project Finance

Course Code	Theory Course Name	L	T	P	Credits	T W A	I S T	E S E	Total	ESE Hours
PE0378	Managerial Accounting, Costing & Project Finance	4	2	-	4-1-0	20	20	60	100	03

COURSE OBJECTIVES

- Provide literacy and proficiency in management accounting, costing, cost control and finance especially project and infrastructure finance.
- Impart proficiency in costing, cost control methods, reading and analyzing financial statements.
- Impart advanced knowledge in the field acquisition and rationing project funding and budgetary control.
- Application of computer software and methods to these topics.

COURSE CONTENT

Managerial Accounting:- Financial statements; assets, liabilities, capital, profit, income, expenses. Accounting concepts; Fixed and current assets, short and long term liabilities, reserves and owners funds. Accounting for income and expenses, cash v/s accrual basis, capital and revenue expenditure, capital and operating income, deferred revenue expenditure; depreciation, depletion and amortization; accounting for fictitious assets and obsolescence, impact of exchange rate variations on corporate financial statements. Mechanics of accounting; ledger and trial balance based on double entry book keeping. Provision in company law and other legal aspects. Balance sheets, profits and loss statements, annual reports of business enterprises.

Costing: - Operating cost; definition, cost of production, cost of sale, labor and material costs, other expenses, variation in elements of operating cost with capacity, production rate; total cost, unit cost, fixed and variable expenses. Cost ascertainment; allocation, apportionment, absorption of overheads and non-production cost; overhead analysis, absorption methods, general considerations. Job costing; factory job costing, contract cost. Unit costing; output and operating cost, simple process costing, normal and abnormal losses in process, waste, scrap, bye-and joint products. Marginal costs and breakdown charges. Cost planning and control, standard cost and budgetary control, setting standards, variance analysis. Cost reduction; tools, techniques and productivity. Depreciation; causes and significance, methods of providing for depreciation, book values, taxes and depreciation. Investments; fixed cost v/s varying capacity, unit cost v/s

varying capacity. Comparison of alternatives; selection in present economy, accepting or nor accepting a single alternative of providing equal / unequal services, unequal first cost and unequal lives, evaluation of replacement. Techniques for comparing alternatives; payout periods, rate of return, discounting methods, minimum acceptable rate, net present value, yield, annual capital charge, cash flow, profit incremental discounted cash flow (DCF) returns.

Project Finance:-Contours of finance function in business, goal of finance, profit maximization and others. Sources of finance and their relative importance. PPP arrangements in project finance, Fund allocation, alternative uses of finance. Capital budgeting; need, uses, limitations. Assessment of capital needs; short and long term capital expenditure, project appraisal. Budgetary control; concept, types of budget. Financial markets; money markets, bill market, discount houses, call loan market, etc., Capital markets; mutual funds, stock markets, industrial banks, world bank, UTI, IDBI, ICICI, and state finance corporations. Corporate planning; taxation and other financial incentives, objectives of corporate planning, capital expenditure and financial management, financial statements, fund flow and cash flow analysis.

Reference Books

1. Management Accounting, M.Y.Khan, P.K.Jain, TMH, 2012

2. Financial Management, I.M.Pandey, Vikas Publication House, 2006

3. Accounting for Management Text & Cases, Bhattacharya S.K., Vikas Publishing House, 2010

4. Fundamentals of Financial Management, Text and Cases Prasanna Chandra, TMH, 2010

5. Managerial Economics, Varshney and Maheshwari, Sultan Chand and Sons, New Delhi. 2011

Quantitative techniques in Project Management

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0379	Quantitative techniques in Project Management	4	-	2	4-0-1	20	20	60	100	03

COURSE OBJECTIVES

To enable in understanding the project management science techniques with modern technological solutions and apply quantitative analysis to different types of organizational decision making situations.

COURSE CONTENT

Project Management overview:- Framework for conceiving, planning, executing and closing projects; Project views of the stakeholders; typical project examples in new product development, manufacturing, services, construction, IT and infrastructure.

Analysis of projects:- Objectives and success criteria- both financial and non financial measures; Capital Budgeting ,Break even analysis, Project evaluation and selection methods using multiple attributes -economic and operation analysis; Decision tree, AHP and Utility theory. Concepts and applications of Work Breakdown Structure (WBS)- Network analysis for time management using CPM, PERT, Crashing and Simulation.

Project Resource Management:- Allocation, Leveling and Smoothing methods; Multi project and multi resource , multi mode scheduling under various constraints- limited resources, limited budget, non-split, start / end lag; Application of Heuristics, Mathematical programming , Evolutionary algorithms such as GA, Application of knowledge-based systems.

Managing Project Risks:- Identification, Assessment and Mitigation. Application of Probability Tree, and Decision Tree and Decision Table for risk management. Application of theory of constraints and critical chain method for planning and controlling a project; role of buffers.

Earned value concept in project control:- Calculation of Schedule and Cost Variances, Quality management through statistical tools and Cause and Effect Analysis

Reference Books

1. Project Management: A Managerial Approach, Meredith, J. R. and Mantel Jr., S. J., John Wiley, New York. 2004

2. Quantitative Methods in Project Management, Good pasture, J. C., J Ross Publishing, Boca Raton, Florida, USA.2003

3. Project Management for Business and Technology: Principles and Practice, Nicholas, J. M.,Prentice Hall India, New Delhi. 2010

4. Project Management: Engineering, Technology and Implementation, Shtub, A., Bard, J. F. and Globerson, S., Prentice Hall, Englewood Cliffs, USA. 1994

5. A Guide to the Project Management Body of Knowledge, Project Management Institute, Newtown Square, Pennsylvania, USA. 2000

6. Project Management: A Systems approach to Planning, Scheduling and Controlling, Kerzner, H., John Wiley, New York. 1998

7. Critical Chain Goldratt, E. M., North River Press, Great Barrington, MA, USA. 1997

Professional Communication & Ethics

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
CC4341	Professional Communication & Ethics	-	-	2	P/NP	-	-	-	-	-

COURSE OBJECTIVES

To understand the principles of professional communication and ethics for effective project manager's role in the organization.

COURSE CONTENT

Professional Communication — Principles of Communication, Verbal Communication, Written Communication, Report Writing, Internal Communication, External Communication, Basics of Business communication, Meaning and importance of communication in business, barriers of communication, Process for drafting Effective Business Message; Letter writing: Good news, Bad news, Informative news, Persuasive news; Memorandum drafting; E-mail writing; Report writing — Short & Long Formal Reports.

Presentation strategies, Strategies to improve - reading skills, speaking skills, listening skills; Guidelines to effective public speaking; Developing job application — Covering letter, Resume; Interviewing: Negotiating the job offer.

Handling Business Information — Annual Report, House Magazine, Press Release, Press Report.

Group Communication: Introduction, Group Discussion, Organizational Group discussion, Group discussion as part of selection process.

Research paper, Dissertation and Thesis writing.

Business Ethics:-

What is Ethics, Nature and scope of Ethics, Facts and value, Ethical subjectivism and Relativism,

Moral Development (Kohlberg's 6 stages of Moral Development), Ethics and Business, Myth of a moral business.

Decision making (Normal Dilemmas and Problems): Application of Ethical theories in Business

(i) Utilitarianism, (ii) Deontology Virtue Ethics.

Economic Justice: Distributive Justice, John Rawls Libertarian Justice

Ethical Issues in Functional Areas of Business.

Characteristics of Free and Perfect competitive market, Monopoly oligopoly, Ethics in Advertising (Truth in Advertising).

Finance: Fairness and Efficiency in Financial Market, Insider Trading, Green Mail.

HR: Workers Right and Duties: Work place safety, sexual harassment, whistle blowing.

Reference Books

1. Technical Communication — Principles and Practices, Meenakshi Raman and Sangeeta Sharma, Oxford University Press,2004.
2. Ethics in Information Technology, George Reynolds, Thomson Course Technology, 2003.
3. Effective Technical Communication by M Ashraf Rizivi, Tata Magraw Hill, 2005
4. Ethics in Engineering by Mile W Martin and Ronald Schinzinger, Tata Magraw Hill, 2003

Constitution of India

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
CC4342	Constitution of India	-	2	-	P/NP	-	-	-	-	-

COURSE OBJECTIVE

To provide overview of constitution of India.

COURSE CONTENT

- Introduction to Indian Constitution and its salient features.
- Fundamental Rights and their significance.
- Definition of the State under Art.12.
- Dimensions of Article 13.
- Right to equality and protective discrimination — Articles 14,15 & 16.
- Fundamental freedoms — Art. 19 and Reasonable restrictions
- Right against exploitation — Articles 23,24
- Doctrine of Double jeopardy, self-incrimination and ex-post facto laws —
- Article 20
- Right to life and personal liberty — Art.21
- Preventive Detention and Constitutional safeguards — Art.22
- Freedom of Religion — Art. 25,26,27,28
- Cultural and Educational Rights — Art. 29-30
- Right to Constitutional Remedies — Articles 32, 226 and concept of Public Interest
- Litigation.
- Directive Principles of State Policy, their significance and relationship with
- Fundamental Rights including Directive Principle's under constitution of J&K.

Reference Books

1. V.N. Shukla's: Constitution of India (Ed. By M.P. Singh).
2. M.P. Jain: Indian Constitutional Law.
3. M. Hidayatullah (Ed.): Constitutional Law of India.
4. D.D. Basu: Shorter Constitution of India.
5. H.M. Seervai: Constitutional Law of India.
6. Brij Kumar Sharma Introduction to the Constitution of India.
7. Justice A.S. Anand: The Constitution of J&K:Its Development & commentsCommercial laws.

Research Methodology

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0380	Research Methodology	03	2	-	3-1-0	20	20	60	100	03

COURSE OBJECTIVES

- Impart fundamentals of concepts, construct, theory, research, research methodology-(methods ,techniques ,tools)
- Develop capability to undertake empirical and quantitative research using scientific methods.
- Impart knowledge of selecting and using relevant statistical methods in research.
- Develop capability in using quantitative methods with software.
- Provide knowledge and skill in writing technical reports in standard format.

COURSE CONTENT

Introduction of Research Methodology: Meaning and purpose of research, objectives of research, types of research, significance of research, Research Approaches, Research Methods v/s Methodology, Research Process, Criteria of Good Research. Research and Scientific Methods problems encountered by researchers in India.

Research Problem: Steps in Research: Identification, selection and formulation of research problem- Research questions-Research design- Formulation of hypothesis-Review of literature. Definition, necessity and techniques of defining research problem; Formulation of research problem; Objectives of research problem.

Research Design: Meaning need and features of good research design. Types of Research Designs, Basic Principles of Experimental Designs; Design of experiments.

Sampling Designs and Technique: Sampling theory-Types of sampling-Steps in sampling-Sampling and Non-sampling error-Sample size —Advantages and limitations of sampling. Census and Sample surveys, Different types of sample designs, characteristics of good sample design. Techniques of selecting a random sample.

Data Collection: Primary and secondary data. Primary data-Meaning, Collection methods -Observation — Interview-Questionnaire-Schedule-Pretest-Pilot study —Experimental and case studies- Secondary data- Meaning — Relevance, limitations and cautions.

Hypothesis: Definition, Fundamentals and procedure of hypothesis testing, flow diagram for hypothesis testing. Measurement in Research: Measurement scales — Tests of good measurement construction of Likert and Semantic Differential scales-Source of errors in measurement- Scale validation. Parametric and non-parametric tests of hypothesis testing-Important non-parametric tests: Sign, Run Kruskal-Wallis tests and Mann — Whitney test.

Parametric Tests: Testing of significance mean, proportion, variance and correlation-Testing for significance of difference between means, proportions, variances and correlation coefficients. Limitations of tests of hypothesis

ANOVA and Chi-Square Tests: One-way and two-way ANOVA — Latin Square tests for association and goodness of fit.

Technical Paper and Report Writing: Basic concepts of paper writing and report writing, review of literature, Concepts of Bibliography and References, significance of report writing, steps of report writing, Types of Research reports, Methods of presentation of report.

Process and Structuring the Report: Types of reports, Contents, Styles of reporting, Steps in drafting reports, Chapter format, Pagination, Identification, Using quotations, Presenting footnotes — abbreviations, Presentation of tables and figures, Referencing, Documentation, Use and format of appendices- Indexing Editing and evaluating the final draft.

Research ethics: Ethical Issues, Ethical Principles that govern Research, Ethically valid Information Sources, Regulatory Compliance.

Reference Books

1. Research Methodology: R. Panneerselvam, Prentice Hall Publication ,2004
2. Research Methodology: Methods and Techniques by C. R. Kothari New Age International Publishing, second edition.
3. Statistical Methods for Research Workers , Fisher R. A. Macmillan Pub Co, 1970
4. Design and Analysis of Experiments, Montgomery D.C. John Wiley, 2001

Infrastructure Management

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0381	Infrastructure Management	3	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

To understand the basic s of Infrastructure management and it's significance for effective project manager's role in the organization.

COURSE CONTENT

Project report preparation:-Basic study, investigations and feasibility studies, project formulation, SWOT analysis, project report.

Appraisal: - What is an infrastructure project, project development cycle, what is appraisal, Need of appraisal, steps of appraisal.

Market appraisal:- Demand analysis, forecasting demand, sources of information, market survey, uncertainties in demand forecasting.

Management appraisal:- Assessment of entrepreneur, chief executive, board of directors, departmental heads, organization as a whole.

Technical appraisal:- Location, land, buildings, technology and its appropriateness, size of plant, plant and machinery, raw materials, energy requirements, water supply, effluent disposal.

Financial and economic appraisal:- Cost of project, means of financing, profitability, break-even analysis, financial projections, financial appraisal tools: urgency, payback period, accounting rate of return, net present value, internal rate of return, benefit cost ratio, cost of capital, risk analysis, social cost benefit analysis.

Ecological appraisal:- Environmental impact analysis.
Project implementation:- Agencies involved in implementation, methods of implementation like Build, operate and transfer (BOT) method and its variants like BOO, BOOT, BOLT etc.

Project financing:- Types and sources (local and international)

Reference Book

Project Preparation, Appraisal, Budgeting, and Implementation: Prasanna Chandra, Tata McGraw Hill.

Project Risk Management

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
CE0457	Project Risk Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

To understand the basics of project risk management.

COURSE CONTENT

Risks:- Definition, dynamic and static risk, uncertainty and risk.

Risk and construction:- Time, money and technology, the people and the risks, processes and risks, risks and clients, consultants and contractors, decision making in construction, contracts and risks.

Risk management system:- Risk identification, sources of risks, risk classification, types, impact and consequences of risk, risk analysis, scenario analysis, risk response: retention, reduction, transfer, avoidance.

Tools and techniques of risk management:- Risk adjusted discount rate, subjective probabilities, decision analysis, multi-attribute value theory, sensitivity analysis, Monte-carlo simulation, portfolio theory.

Utility and risk attitude:- Utility theory, utility function.
Risk analysis of single projects:- Risk measures, analysis of un-correlated, perfectly correlated and moderately correlated cash flows, sensitivity analysis, simulation analysis, decision tree analysis. Risk analysis in practice.

Disasters:- Natural and manmade, possible effects, identifying critical processes and systems.

Disaster recovery plan:- Basic requirements, documenting disaster recovery plan, rehearsing the disaster recovery plan, example disaster recovery plan.

Reference Books

1. N J Smith , Managing Risk in Construction Projects.
2. L W Zimmerman and G D Hart, value Engineering, CBS Publishers.
3. R Flagnan R and G Norman, Risk management and Construction, Blackwell Scientific.
4. Thompson P A and Perry J G, Engineering Construction Risks- A guide to Project risk analysis and risk management, Thomas Telford

Organizational Behaviour & Human Resource Management

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0383	Organizational Behaviour & Human Resource Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- Provide in depth understanding of theoretical development in human resource management and OB.
- Impart critical knowledge of leadership, GD, communication, motivation so to enable it to apply to proactive to use these resources efficiently and effectively.
- Use case study approach to make subject interesting and live.

COURSE CONTENT

Human Resource Management:- Strategic Human Resource Management, Creating Learning organizations, Corporate Social Responsibility, Value creation through HRM, Talent acquisition and Talent management, Business Leadership, Organization culture, Time management, Conflict management, Work values, HR Valuation and accounting, Emotional intelligence.

Organizational Behaviour: Introduction to Organisational Behavior, Management & Managers, OB-The Emerging Challenges, Historical Evaluation of Organisational Behavior, Foundation of Individual Behavior, Intelligence, Personality, Perceptions & attribution, Learning, attitudes & values, Motivation — Theories & principles, Applied Motivation Practices, Work Stress, Group dynamics, Team Dynamics, Power & political behavior, Conflict & negotiation, Leadership, Communication, Organizations, Organisational culture, Creativity & innovation, Organisational change & development, Decision making, Human resource policy & practices, International Organisational behavior.

Reference Books

1. Organizational Behavior: Texts & Cases, A.K. Chitale, R.P. Mohanty & N.R. Dubey, PHI Learning Pvt Ltd,2012
2. Organizational Behavior , K. Aswathappa, Himalaya Publications,2005.
3. Industrial Psychology Tiffin and Meccormic, Prentice hall 7th edition.
4. Social Psychology of Organization Behavior , Katz and Kahn, Wiley, 2nd edition.
5. Industrial Psychology by Ghosh and Ghorpede ,Himalaya publication 2010

Intellectual Property Rights

Course Code	Theory Course Name	L	T	P	Credits
CC4343	Intellectual Property Rights	-	2	-	P/NP

COURSE OBJECTIVES

Provide in depth understanding of intellectual property rights and their significance in Project management.

COURSE CONTENT

- Different types of Intellectual Property Rights
- What is patent
- Indian Patent laws and procedure for applying for a patent
- Patentable and non patentable inventions
- Patent search - national and Global
- Excavating and Exploiting the Patents Mine
- Trade Related aspects of Intellectual Property Rights
- Intellectual Property Protection of Living Species
- Exercising and Enforcing of Intellectual Property Rights
- International protection of Intellectual property
- Traditional Knowledge
- Controlling Overuse or Misuse of IPR
- Development and Transfer of technology, Assessment of technology, collaboration and absorption of technology.
- Rules in Technology Transfer — from Laboratory to Industry, Industry to Industry
- Entrepreneurial obligation based on innovation, based on patent right of individuals
- Exhaustion Principle and Parallel Imports
- Protecting Software and Computer-Related Innovations

Reference Books:-

1. Bare Act with Short notes, Universal Law Publishing Co. Pvt. Ltd.
2. Dr. B. L. Wadhera, Law Relating to Intellectual Property, Universal Law Publishing Co. Pvt. Ltd
3. Prabuddha Ganguli, Intellectual Property Rights, Mc Graw Hill Education, ISBN: 9780070077171.
4. Vandana Shiva, Protect Or Plunder?: Understanding Intellectual Property Rights, Published 2001.
5. Keith Eugene Maskus, Intellectual Property Rights in the Global Economy Published 2000, Peterson Institute.
6. Susan K. Sell Private Power, Public Law: The Globalization of Intellectual Property Rights Published 2003, Cambridge University Press.

Commercial Laws

Course Code	Theory Course Name	L	T	P	Credits
CC4344	Commercial Laws	-	2	-	P/NP

COURSE OBJECTIVES

Provide an overview of commercial laws and their significance in Project management.

COURSE CONTENT

Basics of law:- law of tender; law of tort; role of the project manager; insurance; bonds; builders liens; labour law; intellectual property; avoidance of claims and disputes; ADR, the arbitration act; future trends in contracting.

Sale and Acquisition of Goods:- Transfer of Title, The rule nemo dat quod non habet, Exceptions to nemo dat. Legal and Equitable Interest, Sale of Goods, Duties of Sellers and Buyers, Express and Implied Terms, Passing of Property, Applicable nemo dat exceptions, Remedies Non-sale Acquisitions: nemo dat, Applicable nemo dat exceptions.

Personal Property:- Personal Property and Interests in Personal Property, Types of Personal Property - Chose in Possession - Chose in Action, Ownership (especially mere equities) - Possession (finders' possessory, interests) - Bailment; Legal and Equitable Assignment Credit and Security Types of Security: Pledges - Liens — Mortgages (other than of land) - Bills of Sale - Fixed and Floating Charges Retention of Title (Romalpa) Clauses Set-off; Assignments of Choses in Action: Statutory, Legal and Equitable, Assignments, Rules of Priority, Banking and Customer Relationship, Negotiable Instruments: Bills ofExchange

Consumer Credit and Protection:- Regulatory Framework, Money Lenders Ordinance and Pawn Brokers Ordinance, Function and Power of Consumer Council, Funds for Litigation and Group Litigation Consumer Credit, Law of Guarantees, Consumer Protection, Unconscionable Contracts Ordinance, Control of Exemption Clauses Ordinance, Supply of Services (Implied Terms) Ordinance, Money Lenders Ordinance, Protection of Vulnerable Consumers: Misrepresentation, Undue Influence, Duress, Powers and Responsibilities of Personal Guarantor, Doctrine of relation back and fraudulent preference.

Reference Books

1. Chan Bo-ching, Simon, “Hong Kong Banking Law and Practice”, Volumes One and Two, The Hong Kong Institute of Bankers, 2000 — 2001.

2. P Smart, CD Booth, S Briscoe, “Hong Kong Corporate Insolvency Manual”, Hong Kong Society of Accountants, 2002.

3. PS Atiyah, John N Adams & Hector MacQueen, "The Sale of Goods", 11th Edition, Longman, 2005

4. R Goode, "Commercial Law", Penguin, 3rd Edn, 2004

5. LS Sealy, RJA Hooley, "Commercial Law: Text, Cases and Materials", 4th Edition

6. R Calnan, Taking Security: Law And Practice, Jordans, 2006.

7. H Beale, M Bridge, L Gullifer and E Lomnicka, The Law of Personal Property

Sustainable Manufacturing & Supply Chain Management Operations

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0384	Sustainable Manufacturing & Supply Chain Management Operations	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES:

- Impart analytical and conceptual skills in managing supply chain in coordinated manner.
- Provide foundation for sustainable and eco-friendly management of entire product lifecycle.
- To deepen the understanding of SCM by studying quantitative models and solving problems.
- Application of case study approach to understand real world complexity in managing supply chain.

COURSE CONTENT

Sustainable Manufacturing, Green Manufacturing, Value Stream Mapping

Building a Strategic Framework to analyze Supply Chains: Understanding the Supply Chain, Supply Chain Performance, Supply Chain Drivers and Metrics.

Designing the Supply Chain Network: Designing Distribution Networks and applications to Business, Network Design in the Supply Chain, Network Design in an Uncertain Environment.

Planning Demand and Supply in a Supply Chain: Demand Forecasting in a Supply Chain, Aggregate Planning in a Supply Chain, Managing Predictable Variability.

Planning and Managing Inventories in a Supply Chain: Managing Economics of Scale in a Supply Chain, Managing Uncertainty in a Supply Chain, Determining the Optimal level of Product Availability.

Designing and Planning Transportation Networks.

Managing Cross Functional Drivers in a Supply Chain: Sourcing Decisions in a Supply Chain, Information Technology in a Supply Chain.

Case Studies on above syllabus.

Reference Books

1. Supply Chain Management: Strategy, Planning & Operation, Chopra Sunil, Meindel Peter & Kalra D.V. , Pearson Prentice Hall.2011
2. Supply Chain Management: Texts & Cases, Shah Janat, Prentice Hall ,2011,
3. Materials Management Texts & Cases, Chitale A.K., Gupta R.C. & Gupta H.N.,PHI, 2011
4. The New Manufacturing Architecture, B.Mahadevan, Tata McGraw Hill Publishing Company Ltd ,2010
5. Operations Management, L.C.Jhamb, Everest Publishing House, Pune. 2010

Operations Strategy

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0385	Operations Strategy	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- Explain business and functional strategies and importance of operations strategy.
- Provide comprehensive framework for development of operations strategy in a given competitive environment and overall business strategy.
- Enable the particular project to select appropriate operations strategy.
- Develop in depth understanding of operations strategy of successful firms through case studies.

COURSE CONTENT

Principles of Strategy: Principles of Competitive Strategy, Partnerships, Challenges, and Responses. Introduction, Need and concepts of Operations strategy and links with corporate strategy.

Operations Strategy in a Factory: Manufacturing Outputs and Production Systems, Manufacturing Levers and Capability,

Competitive Analysis: Selecting the Best Production System. Framework for Manufacturing Strategy -Process of formulation and implementation. Emerging theory of manufacturing. Time the new source of competitive strategy. Competing through manufacturing.

Operations Strategy in an International network of factories: Principles of international competitive strategy, manufacturing in the world's major trading regions, manufacturing networks, network outputs, levers and capability, factory-types in international manufacturing networks.

Operations Strategy and Business Strategy

Integrating Operations strategy with business strategy

Programs used frequently in Operations strategy:-Improvement programs in operations, Focus, soft technologies, hard technologies, benefits of experience and the product life cycle, Evaluation of investments in manufacturing. Seven Production Systems for Focused Factories

Job shop production system, Batch flow production system, Flexible manufacturing system, Operator-paced line flow production system, Just-in-Tine production system, Equipment-paced line flow production system, Continuous flow production system.

Reference Books

1. Manufacturing Strategy, Hill, Terry, Richard D. McGraw-Hill, Irwin Inc, Third Edition1999

2. Strategic Operations, Competing through Capabilities: Hayes, Robert H., Gary P. Pisano and David M. Upton, The Free Press,1996

3. Manufacturing Strategy: John Miltenberg, Productivity Press, 2005

Maintenance Engineering & Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0386	Maintenance of Assets	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

To Provide comprehensive understanding of maintenance management.

COURSE CONTENT

Introduction to maintenance systems: -Maintenance definition — Maintenance objectives — Maintenance management —Functions of maintenance department — Tero technology —Maintenance costs.

Maintenance models:-Maintenance policies — Imperfect maintenance — PM versus b/d maintenance —Optimal PM schedule and product characteristics — Inspection decisions: Maximizing profit — Minimizing downtime — Replacement models.

Maintenance Logistics:- Maintenance staffing — Human factors —Resource requirements: Optimal size of service facility — Optimal repair effort — Maintenance planning and scheduling — Spares planning — Capital spare.

Maintenance Quality:- Five Zero concept —FMECA — Maintainability prediction— Design for maintainability —Maintainability allocation — Reliability Centered Maintenance.

Total Productive Maintenance:- TPM fundamentals — Chronic and sporadic losses — Six big losses — OEE as a measure — TPM pillars— Autonomous maintenance —TPM implementation.

Recommended Books

1. Andrew K.S.Jardine & Albert H.C.Tsang, "Maintenance, Replacement and Reliability", Taylor and Francis, 2006.
2. Bikas Badhury & S.K.Basu, "Tero Technology: Reliability Engineering and Maintenance Management", Asian Books, 2003.
3. Seichi Nakajima, "Total Productive Maintenance", Productivity Press, 1993.

Materials Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0387	Materials Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- Provide comprehensive background of materials management including importance and evolution of function, standard procurement practices, vendor selection and rating, logistic and quality management, inventory management with quantitative models.
- Provide legal framework operating materials management.
- Acquaint student with store management documentation and practices.
- Familiarize students with e-procurement practices in globalised world.

COURSE CONTENT

Material Management:- Management In Relation To Materials Function, Functions of Management as Applied to Materials, Management of Material Resources, Objectives of Material Management, Achieving Objectives, Effects of Business Changes, Balancing of Objectives, Limitation to Meeting Objectives.

Integrated Materials Management:- Activities of Materials Management, Importance of Materials Department, Costs involved in the Management of Materials, Need for Integrated Concept, Areas of Materials Management, Materials Management and Production Control, Inspection of Purchased Items, Relative Status of the Materials Managers, Desirable Quality of Purchase Materials Managements, Inter-Departmental Relationships, Advantages of Integrated Materials Managements

Classification, Identification And Codification:- Need For Classification Of Materials, Classification Of Materials — General Classification, Classification According To Condition Of Materials, Nature Of Codification, Process Of Codification, Merits Of Codification, Demerits Of Codification, The Codification Systems, Stores Vocabulary, Marking Of Stores.

Specification in Materials Management:- Objectives of Specification, Collaborative Development, Category of Specification, Development of Specification, Purchase Management Research, Writing Specification, Common Problems in Specification.

Standardization And Variety Reduction:- Historical Review, Three Dimensions Of Standards, Different Levels Of Standards, Various Foreign Standards In Use In India, How Is An Indian Standard Evolved?, Benefits Of Standardization, Standardization and variety reduction in products, Scope of variety reduction and standardization, Techniques Of Variety Reduction, The Three S's - Standardization, Simplification And Specialization, Simplification.

Material Planning:-Importance Of Materials Planning, Factors affecting materials planning, Flow chart for materials planning, Techniques of materials planning.

Budgeting And Material Planning:- Master Budget, Sales Budget, Production Budget, Material Budget, Labour Budget, Maintenance Budget, Overheads Budget, Administrative Budget, Capital Expenditure Budget, R & D Budget, Cash Budget, Flexible Budgeting.

Stores And Stores Keeping:- Storage Equipment, Principles Of Materials Handling, Planning principles, Inventory Control , Inventory Management Models, Selective Inventory Control, The Purchasing Cycle, Principles of Purchasing, The Nature Of Purchasing Process And Vendor Rating, Value Analysis, Quality Assurance in Material Management, Make Or Buy Decisions, The Dangers Of In-Sourcing, Buyer-Seller Relationship, Negotiating Techniques, Disposal Of Surplus Obsolete And Scrap, Performance Appraisal Of Materials Department, Legal Aspect of Purchasing, Purchasing Of Capital Equipment, Public Buying, International Purchasing, Import Substitution, Logistics, Warehousing And Distribution Management, Case Studies on Materials Management.

Reference books

1. Materials Management: Text And Cases, A.K. Chitale, R.C. Gupta, Publisher, PHI Learning Pvt. Ltd 2007
2. Material Management , W. R. Stelzer Jr. (PHI)
3. Material Management, D. S. Ammer & Richard ,Erwin Inc.1980
4. Material Management, A. K. Dutta ,PHI,2004
5. Material Management- An Integrated Approach, P. Gopalakrishnan & M. Sundersen PHI,2006

Managerial Economics

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0388	Managerial Economics	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

The course in Managerial Economics attempts to build a strong theoretical foundation for Project Management students. The course is mainly analytical in nature and focuses on clarifying fundamental concepts from microeconomic viewpoint. The students are expected to study and analyses the dynamics of managerial decision making through this course.

COURSE CONTENT

Definition, Nature and Scope of Managerial Economics, Managerial Economics and Microeconomics and macroeconomics. Managerial Economics and decision-making. Uses and Significance of Managerial Economics.

Meaning and Determinants of Demand. Demand Function, Law of Demand Market Demand, Elasticity of Demand, Types and Measurement of Elasticity, Demand Forecasting. Meaning, Significance and Methods of Demand Forecasting.

Production Function. Law of Variable Proportions. Law of Supply. Elasticity of Supply. Measurement of Elasticity of Supply.

Costs of Production. Short run and long run costs. Economies of Scale. Cost estimation and cost forecasting. Breakeven analysis.

Pricing Under Various Market Forms; Perfect competition, Monopoly Monopolistic Competition. Oligopoly. Price Discrimination.

Pricing Strategies and Methods. Cost plus Pricing. Marginal cost Pricing. Price Leadership. Transfer Pricing. Seasonal Pricing Seasonal Pricing. Cyclical Pricing.

Need For Government Intervention in Markets. Price Support. Price Controls. Prevention and Control of Monopolies. System of Dual Prices.

Recommended Books

1. Managerial Economics — Analysis, Problems and Cases, P.L.Mehta, Sultan Chand and Sons, New Delhi.

2. Managerial Economics - Varshney and Maheshwari, Sultan Chand and Sons, New Delhi.

3. Managerial Economics — D. Salvatore, McGraw Hill, New Delhi.

4. Managerial Economics - Mote, Paul and Gupta T M H, New Delhi.

Total Quality Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0389	Total Quality Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- To understand fundamentals of Customer satisfaction and philosophies of total quality management by renown quality gurus.
- To study various quality related costs.
- To study the scientific tools for quality improvement.
- Introduction to off-line quality control for quality improvement.
- To study the contemporary quality assurance standards.

COURSE CONTENT

Introduction-Quality—Basic concepts, dimensions, economics of quality, quality Gurus.

TQM:- Definition, evolution, journey from inspection to TQM, comparison at different stages, dimensions of TQM, TQM viewpoints, reasons for adopting TQM.

Introspection to TQM environment-Sphere of TQM, components of TQM, TQM — Managing Total Quality, Factors affecting TQM environment, Classification and interaction among factors, Researchers' viewpoint, TQM as a system, steps in TQM implementation, Roadblocks in TQM implementation, Reasons for TQM failure.

Role of soft options in TQM-Hard vs. Soft factors, Role and expectation of employer, employee, customer and supplier from organization and vice versa. Human factors in TQM, Role of top management commitment, work culture, motivation, coordination, attitude, innovation.

Quality initiatives in organizations-Role of tools and techniques in TQM, Classification of tools and techniques — Problem identification, Data analysis, Graphical, Creativity, Companywide . Brief description of Quality awards — MBNQA, Deming award, European quality award, Australian quality award.

TQM Effectiveness-Impact of TQM, Need and difficulty in measuring TQM effect, Parameters governing effect of TQM and the attributes thereof.

Reference books

1. Total Quality Management, Oakland Butterworth — Heinamann Ltd.2007
2. Managing for total quality from Deming to Taguchi and SPC, Logothetis N. PHI,2002 Total Quality Control, Feigenbaum A.V. MGH,1991
3. Total Quality Management, Besterfield Dale H, Pearson Education,2010
4. A slice by slice guide to TQM, John Gilbert, East West Press,2003
5. The TQM toolkit — a guide to practical techniques for TQM, Waller Jenny, Allen Derek and Burna Andrew, Kogan Page London,1995

Facilities Planning and Design

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0390	Facilities Planning & Design	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

This course provides problems based techniques related with location, layout, material handling, maintenance, replacement of machines, etc

COURSE CONTENT

Introduction: Facilities requirement, need for layout study - types of layout.

Plant location: Plant location analysis - factors, costs, location decisions - simple problems in single facility location models, network location problems.

Layout design: Design cycle - SLP procedure manpower, machinery requirements — computer algorithms - ALDEP, CORELAP, CRAFT

Quantitative methods: Group technology - Production Flow analysis (PFA), ROC (Rank Order clustering) - Line balancing.

Materials handling: Principles, unit load concept, material handling system design, handling Equipment types, selection and specification, containers and packaging.

Depreciation, Replacement Analysis.

Reference Books

1. Facilities planning, J.A. Tompkins. And J.A. White, John Wiley, 1984.
2. Plant Layout & Material Handing, J.M Apple, Krieger Publishing Company,1991
3. Facilities Planning and Materials Handling,Vijay Sheth, Marcle Decker, New York.1995
4. Practical Plant layout, Richard Muther, McGraw Hill 1956

Occupational safety, health & environment

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0391	Occupational safety, health & environment	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

Developing the basic knowledge of occupational safety, health & environment & capability to apply ideas/concepts and latest techniques.

COURSE CONTENT

Concepts:- Concept of man-machine system Applications of human factors Engineering- Man as Sensor, Man as Information processor, and Man as Controller. Human Behavior Individual difference Motivation —Frustration and Conflicts — Attitudes -Learning concepts. Principles of Ergonomic Application of ergonomics in a work system — Principle of motion Economy effects of environment. Factors impending safety — Technological factor —Physiological factor —Legal factor Administrative factors Personal protective equipments (different types, specifications, standards, testing procedures, and maintenance). Evolution of modern safety concept- Safety policy - Safety Organization - line and staff functions for safety- Safety Committee- budgeting for safety.

Techniques:- Incident Recall Technique (IRT), disaster control, Job Safety Analysis (JSA), safety survey, safety inspection, safety sampling, Safety Audit.

Accident Investigation and Reporting:- Concept of an accident, reportable and non reportable accidents, unsafe act and condition — principles of accident prevention, Supervisory role- Role of safety committee — Accident causation models - Cost of accident. Overall accident investigation process - Response to accidents, India reporting requirement, Planning document, Planning matrix, Investigators Kit, functions of investigator, four types of evidences, Records of accidents, accident reports- Class exercise with case study.

Safety Performance Monitoring:- permanent total disabilities, permanent partial disabilities, temporary total disabilities - Calculation of accident indices, frequency rate, severity rate, frequency severity incidence, incident rate, accident rate, safety "t" score, safety activity rate — problems.

Safety Education & Training:- Importance of training-identification of training needs-training methods — programme, seminars, conferences, competitions — method of promoting safe practice - motivation — communication - role of government agencies and private consulting agencies in safety training — creating awareness, awards, celebrations, safety posters, safety displays, safety pledge, safety incentive scheme, safety campaign — Domestic Safety and Training.

Regulations for Health, Safety and Environment:- Factories act and rules - Workmen compensation act. Indian explosive act - Gas cylinder rules - SMPV Act - Indian petroleum act and rules. Environmental pollution act Manufacture, Storage and Import of Hazardous Chemical rules 1989 Indian Electricity act and rules. Overview of OHSAS 18000 and ISO 14000.

Reference Books

1. Accident Prevention Manual for Industrial Operations, N.S.C.Chicago, 1982
2. Industrial Accident Prevention, Heinrich H.W. McGraw-Hill Company, New York, 1980.
3. Safety Management in Industry, Krishnan N.V. Jaico Publishing House, Bombay, 1997.
4. The Factories Act 1948, Madras Book Agency, Chennai, 2000
5. The Environment Act (Protection) 1986, Commercial Law Publishers (India) Pvt.Ltd., New Delhi.
6. Water (Prevention and control of pollution) act 1974, Commercial Law publishers (India) Pvt.Ltd., New Delhi.
7. Air (Prevention and control of pollution) act 1981, Commercial Law Publishers (India)Pvt.Ltd., New Delhi.
8. Explosive Act, 1884 and Explosive rules, 1883 (India), Eastern Book company,Lucknow, 10th Edition,2002
9. The manufacture, storage and import of hazardous chemical rules 1989, Madras book Agency, Chennai.
10. ISO 9000 to OHSAS 18001, Dr. K.C. Arora, S.K. Kataria & Sons,2000

Advanced Operations Research

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0321	Advanced Operations Research	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

Developing the basic knowledge of Operations Research & develop capability to apply advanced techniques of Operations research for solving complex problems in Project management.

COURSE CONTENT

Operations Research:- Uses, Scope and Applications of Operation Research in managerial decision-making.

Decision-making environments:- Decision-making under certainty, uncertainty and risk situations; Decision tree approach and its applications.

Linear programming:- Mathematical formulations of LP Models for product-mix problems; graphical and simplex method of solving LP problems; sensitivity analysis; duality.

Transportation problem:- Various methods of finding Initial basic feasible solution and optimal solution.

Assignment model:- Algorithm and its applications.

Game Theory:- Concept of game; Two-person zero-sum game; Pure and Mixed Strategy Games; Saddle Point; Odds Method; Dominance Method and Graphical Method for solving Mixed Strategy Game.

Sequencing Problem:- Johnsons Algorithm for n Jobs and Two machines, n Jobs and Three Machines, Two jobs and m - Machines Problems.

Queuing Theory: - Characteristics of M/M/I Queue model; Application of Poisson and Exponential distribution in estimating arrival rate and service rate; Applications of Queue model for better service to the customers.

Replacement Problem:- Replacement of assets that deteriorate with time, replacement of assets which fail suddenly.

Project Management:- Rules for drawing the network diagram, Applications of CPM and PERT techniques in Project planning and control; crashing of operations.

Recommended Books

1. Vohra, Quantitative Techniques in Management (Tata McGraw-Hill, 2nd edition), 2003.
2. Kothari - Quantitative Techniques (Vikas 1996, 3rd Edition).
3. Taha Hamdy - Operations Research - An Introduction (Prentice-Hall, 7th edition)
4. Sharma J K - Operations Research (Pearson, 3rd Edition)
5. Kapoor V.K. - Operations Research (S. Chand, 4th Edition)

Technology Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0392	Technology Management	3	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

This course attempts to build a strong theoretical foundation for Project Management students which can help them to solve hard problems as well as soft problems through the tools like technology development, acquisition, transfer, knowledge management and soft system methodology.

COURSE CONTENT

Technology management — Scope, components, and overview. Technology and environment, Technology and society, Technology Impact analysis, environmental, social, legal, political aspects, methods or techniques for analysis — steps involved. Technology policy strategy: Science and technology Policy of India, implications to industry. Technology forecasting — need, methodology and methods — trend Analysis, Analogy, Delphi, Soft System Methodology, Mathematical Models, Simulation, and System Dynamics. Technology Choice and Evaluation — Methods of analyzing alternate technologies, Techno-economic feasibility studies, Need for multi-criteria considerations such as, social, environmental, and political, Analytic hierarchy method, Fuzzy multi-criteria decision making, and other methods. Technology Transfer and Acquisition — Import regulations, Implications of "Uruguay Round", and WTO, Bargaining process, Transfer option, MOU. Technology Adoption and Productivity — Adopting technology-human interactions, Organizational redesign and re-engineering, Technology productivity. Technology Absorption and Innovation — present status in India, Need for new outlook, Absorption strategies for acquired technology, Creating new/improved technologies, Innovations. Technology Measurement. Technology Audit.

Recommended Books

1. From Knowledge Management To Strategic Competence: Measuring Technological, Market and Organisational Innovation (Second Edition), edited by Joe Tidd

2. Market-Oriented Technology Management by Fred Phillips, Springer

3. Management of Technology (Hardcover) by Tarek Khalil, Maximilian von Zedtwitz, Georges Haour, Louis A. Lefebvre, Pergamon.

4. Management of Technology: Key Success Factors for Innovation and Sustainable Development by Laure Morel- Guimaraes, Tarek Khalil, Yasser A Hosni , Elsevier Science.

5. Technology Management: Text and International Cases by Norma Harrison, Danny Samson , McGraw-Hill/Irwin; 1 edition, 2001, ISBN: 0072383550.

Ecology and Sustainable Development

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0393	Ecology and Sustainable Development	3	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

To study the ecology and significance of sustainable development.

COURSE CONTENT

Introduction to Ecology and Sustainable Development: Components of the environment, Understanding environment and ecology -a systems perspective, Environment -a multi disciplinary perspective, Methodological approaches for environment & ecology analysis, Micro level environment, Macro level environment, Manmade environment, Natural environment.

Environment: ecology and quality of life, Environmental Crises, State of Environment in Developed and Developing Countries, Natural Resource Economics, Social Cost benefit Analysis, Sustainable Development.

Towards an ecological world: view, Ethics and ecological wisdom, the moral standing of ecosystems, Globalization and environmental issues, Ideologies of environmentalism —Awareness, Struggle, rehabilitation, appropriate technology, Scientific conservation.

Development and environment: Issues of Noise pollution, Land pollution (Municipal industrial, Commercial, hazardous solid waste) Water pollution, Air pollution & Traffic Management,

Ecological Behavior & Knowledge management: recycling, energy, water conservation, political activism, Consumerism, Commitment to environmental organizations.

Corporate Social responsibility: Policy consideration, Training for environmental mental set - The issue of altering habits, Managing Environmental challenges for future

Reference Books

1. The environmental ethics and policy book Philosophy, ecology, economics. II edition. 2003
2. Ecology and equity Madhu Gadgil and Ramchander Guha, Penguin books, 1995
3. Environment, ecology, and social development: Anuradha Sharma

Environmental Impact Assessment & Audit

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
CE0353	Environmental Impact Assessment & Audit	3	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVE

To study the impact of project on environment.

COURSE CONTENT

Environmental impact assessment, Brief history, Significance, Objectives, Role in planning and decision making process, Environmental assessment process, Assessment methodologies, Socioeconomic impact assessment, air, noise , water , vegetation & wildlife and energy impact analysis, cumulative impact assessment, ecological impact assessment, risk assessment, Environmental impact statement, Basic concepts behind EIS, Various Stages in EIS production, Typical EIS outline, Rapid EIA, Environmental auditing, Aims & Objectives, Audit principles, Partial environmental audits, Scope of audit, Case studies

Reference Books

1. Environmental Impact Assessment, Larry W. Canter, Mc-Graw Hill international Edition 1995.

2. Environmental Audit ,A.K. Mhasker, M/s Media Enviro EIA Notification Govt of India, 2005

Innovation, Entrepreneurship & Business Transformation

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0394	Innovation, Entrepreneurship & Business Transformation	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES:

- Emphasis the concept and importance of innovation, entrepreneurship and business transformation.
- Provide methodical and comprehensive framework for developing innovative and entrepreneurial organization.
- Provide understanding for creating environment and strategies for success full business transformation.
- Develop understanding of real world complexity through case studies.

COURSE CONTENT

Innovations Vs Creativity, Strategic Management of Technology through Creativity & Innovation, Technology Fusion and R & D, Knowledge Management fundamentals, Entrepreneurship & Economic Development, Concept, Need and functions of entrepreneurship, Types of ownership, Risk management, Theories of Motivation, Operating environment of small industrial units, Socio-Psychological aspects of Entrepreneurship Development, Personnel Management & Industrial Relations, Inventory Management, Managerial Economics, Marketing & Distribution Management for small industries sector, Government Support, Incentives and Regulations for Ancillaries and Small Industrial Units, Procedure for starting new Industrial Unit, Sources of finance, The economic theories of development and their limitations; entrepreneurship behavior with special reference to risk taking behavior, psychological characteristics of entrepreneurs and Entrepreneur as an agent of change, Corporate Social Responsibility, Organizations as a laboratory of learning, Women entrepreneurship, Techniques for Total Productivity & Quality Management, Case studies on Entrepreneurship.

Reference Books

1. Management of Technology and Innovation: Competing through Technological Excellence, P.N. Rastogi, Sage Publications Inc, California.2009

2. Entrepreneurship, Creativity and Organization: Text, Cases & Readings, John J. Kao Prentice Hall, Englewood Cliffs, and New Jersey.2007

3. Innovation & Entrepreneurship: Practice & Principles, Peter F. Drucker Affiliated East-West Press Pvt Ltd, New Delhi.1992

4. Entrepreneurial Development, Vasant Desai , Himalaya Publishing House, Mumbai.2010

5. Entrepreneurship, David H. Holt, Prentice Hall India.2005

6. Handbook of Management Skills , The Industrial Society Robert Hyde House, London.2006

Marketing Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0395	Marketing Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- Provide comprehensive understanding of market, marketing, selling and marketing mix.
- Impart appropriate background for designing marketing strategy including PLM for a firm.
- Give insights and real world complexity in marketing through Indian case studies

COURSE CONTENT

Introduction to Marketing function: genesis, the marketing concept.

Marketing Management System: objectives, its interfaces with other functions in the organization.

Environment of Marketing- Economic Environment, Market: market segmentation. Consumer-buyer behavior models. Socio- cultural environment. Legal Environment. Ethical issues in marketing.

Marketing Strategy: Marketing planning and Marketing programming. The concept of marketing mix, Product policy; the concept of product life cycle. New product decisions.

Test marketing- Pricing Management of distribution: channels of distribution. Advertising and production. The concept of Unique Selling Proposition.

Implementation and Control: The marketing organization- alternative organization structures; the concept of product management. Administration of the marketing programme, sales forecasting; marketing and sales budgeting; sales management; management of sales force. Evaluation of marketing performance; sales analysis; control of marketing effort; marketing audit.

Reference Books

1. Marketing Classics, A Selection of Influential Articles, Enis, B.M. New York, McGraw Hill, 1991.

2. Principles of Marketing. Kotler, Philip and Armstrong,G New Delhi, Prentice Hall of India, 1997.

3. Marketing Management: Analysis, Planning, Implementation and Control, Kotler, Philip. New Delhi, Prentice Hall of India, 1994.

4. Marketing Management: Planning, Control, Ramaswamy, VS and Namakumari, S New Delhi, McMilian, 1990.

5. Fundamentals of Marketing. Stanton, William, J. New York, McGraw Hill, 1994.

6. Marketing in India: Cases and Readings. Neelamegham, S. New Delhi, Vikas 1988.

MIS & Enterprise Resource Planning

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0396	MIS & Enterprise Resource Planning	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

To understand the role of Management Information System and ERP in project management**.**

COURSE CONTENT

Introduction:- Organization & Types, Decision Making, Data & information, Characteristics & Classification of information, Cost & value of information, various channels of information & MIS.

Foundation of Information System: Introduction to Information System in Business Fundamentals of Information System, Solving Business Problems with Information System, Concept of Balanced MIS, Effectiveness & Efficiency Criteria. Tool and Techniques of MIS- dataflow diagram, flow chart etc.

Business application of information technology: electronic commerce Internet, Intranet, Extranet & Enterprise Solutions, Information System for Business Operations, Information system for managerial Decision Support, Information System for Strategic Advantage.

Managing Information Technology: Enterprise & Global Management, Security & Ethical Challenges, Planning & Implementing Change. Reports: Various types of MIS reports, GUI & Other Presentation tools.

Advanced concepts in information system: Enterprise Resource Planning: introduction, various modules like Human Resources, Finance, Accounting, Production Logistics.
Supply Chain Management, CRM, Procurement, and Management System Object Oriented modeling case studies.

Reference Books

1. Introduction to Information System, O.Brian, McGraw Hill.2012
2. Management Information System, O.Brian, Galgotia Publications ,2011
3. Information Systems for Managers, Arora & Bhatia, Excel,2009
4. Information System Analysis & Design, Bansal, TMH.2004
5. Alexis Leon, "Enterprise Resource Planning", TMH.2007

Operations Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0397	Operations Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- To gain an understanding and in-depth knowledge of the various operations management philosophies and practices prevalent in industry.
- To reinforce analytical skills already learned, and build on these skills to further increase ones "portfolio" of useful analytical tools.
- To learn how to think about, approach, analyze, and solve production system problems using both technology and people skills.

COURSE CONTENT

Overview of Production & Operations Management:- Introduction , Responsibilities of Production Manager, Strategic Decisions in Operations, Manufacturing Vs. Service Operation, Types of Production processes (Project/Job, Batch, Mass/Line , Continuous), Concept of FMS(Flexible Manufacturing System), Vertical integration, Productivity & Factors affecting productivity, Role of Production, Planning & Control (PPC), New Product Development & Process Design, Learning Curve, Introduction of Work Study, Method study Procedure, Principles of Motion Economy, Stop Watch Time Study Procedure, Importance of Rating & Allowances in Time Study, Pre-determined Time Standard (MTM).

Aggregate Planning, Capacity Planning and Project Management, Scheduling, Maintenance Management:- Aggregate Planning: Relevant cost; Evaluation of strategic alternatives (Level, Chase and Mixed), Types of capacity, Economics and Diseconomies of scale, Developing capacity alternatives. Project Management: Basic concept, Network principles-CPM, PERT, Crashing, Sequencing,2 and 3 Machine cases: Johnson's Rule, Job shop Scheduling: Priority dispatching Rules, Importance of Maintenance, Breakdown, Preventive, Predictive and TPM(Total Productive Maintenance), Basic concept of Reliability.

Facility Location and Layout, Inventory Control, Quality Control:- Importance & Factors affecting the Plant Location, Single and Multi facility location Techniques (Centroid and Minimax method), Plant Layout & its classification, Relationship Diagram & Block Diagramming, Assembly Line of Balancing, Inventory Control: Relevant Costs, P & Q Systems of Inventory, Basic EOQ Model, and Model with Quantity discount, Economic, Batch Quantity. Safety Stock, Reorder Point, ABC Analysis, Material Requirement Planning, Concept of Quality Management, Quality of Design, Statistical Quality Control, X Bar, R and P Charts. Acceptance sampling, Elementary concept on TQM (Total Quality Management) ,JIT(Just In Time)

Case Study:- Relevant cases have to be discussed in following areas: Aggregate Planning Strategies, CRAFT (Computerized Relative Allocation of Facilities Technique), ROC (Rank Order Clustering Method), Material Requirement Planning.

Reference Books

1. B.Mahadevan, Operations Mangement: Theory and Practice, PEARSON Education,2012.
2. Narasimhan, Mcleavey, Billingten, Production Planning & Inventory Control, Prentice Hall of India, Edition 1997.
3. Chary S.N., Theory and Problems in Production and Operation Management, Tata McGraw Hill, Edition 1995.
4. Roberta S. Russell, Bernard W. Taylor III, Operations Management, Wiley India, Edition 2007.
5. Lee J. Krajewski, Larry P. Ritzman, Manoj K. Malhotra, Operations Management 9/E, Prentice Hall, Edition 2009.

World Class Manufacturing

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0357	World Class Manufacturing	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

- To understand the concept of Excellence in manufacturing — Traditional & current concepts.
- Building organization strength through Customer focus — Overcoming impediments.
- To learn how to achieve stability and sustain Excellent manufacturing practices.
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COURSE CONTENT

Historical perspective:- World class Excellent organizations — Models for manufacturing excellence —Business Excellence.

Benchmark, Bottlenecks and Best Practices:- Concepts of benchmarking, bottleneck and best practices, Best performers — Gaining competitive edge through world class manufacturing — Value added manufacturing — eliminating waste — Toyota Production System —example.

System & tools for world class manufacturing:- Improving Product & Process Design — Lean Production — SQC , FMS, Rapid Prototyping , Poka Yoke , 5-S ,3 M, use of IT ,JIT, Product Mix , Optimizing , Procurement & stores practices , Total Productive maintenance , Visual Control.

Human Resource Management in WCM:- Adding value to the organization — Organizational learning — techniques of removing Root cause of problems — People as problem solvers — New organizational structures. Associates — Facilitators — Teamwork — Motivation and reward in the age of continuous improvement.

Typical characteristics of WCM companies:- Performance indicators — what is world class Performance — Six Sigma philosophy

Indian Scenario:- Leading Indian companies towards world class manufacturing – Task Ahead.

Reference Books

1. World Class Manufacturing - Strategic Perspective - B.S. Sahay, KBC Saxena , Ashish Kumar .,Mac Millan,2000
2. Making Common Sense Common Practice — Models for manufacturing excellence — Ron Moore ,Butter worth Heinmann ,2004
3. The Toyota Way - Jeffrey K.Liker — Tata Macgraw Hill,2004
4. Operations Management for Competitive Advantage — Chase,TMH,2006
5. Managing Technology & Innovation for Competitive Advantage — Narayanan,Pearson,2001
6. Just In Time Manufacturing — M.G.Korgaonkar ,Mac Millan,2000
7. Machine That Changed The World — Womack,Free press New York,2007

Disaster Management

ELECTIVE

Course Code	Theory Course Name	L	P	T	Credits	TWA	IST	ESE	Total	ESE Hours
CE0457	Disaster Management	03	-	-	03	20	20	60	100	03

COURSE OBJECTIVES

The Course would focus on types of Environmental hazards & Disasters. The main objective is to study the emerging approaches in Disaster Reduction & Management. The emphasis will be on programmes of National & International organizations for Disaster preparedness, Mitigation and awareness.

COURSE CONTENT

Environmental Hazards & Disasters: Concept of Environmental Hazards, Environmental stress & Environmental Disasters, Different approaches & relation with human Ecology, Human ecology & its application in geographical researches, Types of Environmental hazards & Disasters.

Emerging approaches in Disaster Management- Three Stages: Pre- disaster stage, Emergency Stage, Post Disaster stage-Rehabilitation Natural Disaster Reduction & Management

Disaster Management- An integrated approach for disaster preparedness, mitigation & awareness.

Integrated Planning- Contingency management Preparedness: Education on disasters, Community involvement, The adjustment of Human Population to Natural hazards & disasters Role of Media

Monitoring Management- Discuss the programme of disaster research & mitigation of disaster.

Reference Books

1. Environmental Geography, Savinder Singh ,Prayag Pustak Bhawan, 1997
2. The Environment as Hazards, Kates,B.I & White, G.F, Oxford, New York, 1978
3. Disaster Management, R.B. Singh, Rawat Publication, New Delhi, 2000
4. Space Technology for Disaster Mitigation in India (INCED),R.B. Singh, University of Tokyo, 1994
5. Action Plan For Earthquake, A.S. Arya Disaster, Mitigation in V.K. Sharma Disaster Management IIPA Publication New Delhi, 1994
6. An overview on Natural & Manmade Disaster & their Reduction, R.K. Bhandani, CSIR, New Delhi ,1994
7. Manuals Natural Disaster management in India, National Centre for Disaster Management, M.C. Gupta IIPA, New Delhi, 2000

Software Project Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0398	Software Project Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

Developing the basic knowledge of software project management & capability to apply ideas/concepts and latest techniques.

COURSE CONTENT

Introduction and Software Project Planning:- Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

Project Organization and Scheduling:- Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

Project Monitoring and Control:- Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index(SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

Software Quality Assurance and Testing:- Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process.

Project Management and Project Management Tools:- Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS- Project.

Recommended Books

1. Software Project Management by M. Cotterell
2. Software Project Managemnet by S. A. Kelkar

International Business

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
PE0399	International Business	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

To enlighten the students on International Business Environment, which includes international Financial management, International marketing and international Currency and to study the impact of globalization on Indian Industry.

COURSE CONTENT

Meaning and features of International Business Management, Globalization forces — Meaning, dimensions and stages in Globalization — Globalization Boon or bane — Introduction to theories of International Trade by Adam Smith, Ricardo and Ohlin & Heckler — Trading Environment of International Trade- Tariff and Non-Tariff Barriers — Trade blocks.

Analysis of Global Environment — Political Economic, Social & Cultural Legal, Technological, Natural Environments country Risk Analysis. Opportunities and threats for International Business. Rise of New economics like Brazil, Russia, India and China (BRIC) and ASIAN countries.

International Financial Management — Balance of Trade and Balance of Payment — International Monetary fund. Asian Development Bank, World Bank, Introduction to Export and Import finance, methods of Payment in International Trade, International Financial Instruments.

Bilateral and Multilateral Trade Laws — general Agreements on Trade & Tariffs (GATT), World Trade Organization (WTO), different rounds, IPR, TRIPS, TRIMS, GATS, Ministerial Conferences, SAARC.

International Marketing — Objectives and Challenges in International Marketing, Major Players in International marketing, market Selection, Entry Strategies.

International Currency and Currency Crisis

Euro-Phases, Benefit and cost
Euro and Implication for India
Trade invoicing in Euro Vs Dollar
Southeast Asian Currency Crisis

Globalization and its impact on Indian Industry- globalization and Internal reform process, current Exim Policy. India's Competitive advantage in Industries like. I.T., Textiles, Gems & Jewelry etc. — Potential and threats, Indian Multinationals. SEZ — Introduction — Types of economic zones, Meaning and Nature of SEZ — Mechanism of setting of SEZ, opposition to SEZ.

Case Studies and Web Exercises:-

a) Case Studies on:- Global Environment Analysis, International Marketing, International Finance, Country Risk Analysis

b) Web Exercises:- Visit websites of different International organizations like, UNO, World Bank, International Monetary Fund, SAARC, Euro and related links etc.

Reference Books

1. International Business Environment — Sundaram and Black
2. International Business Environment — Bhalla and Raju
3. International Financial Management — P.G. Apte
4. International Business — Francis Cherunilam
5. International Business — Rao and Rangachari
6. International Business Environment and operations –John D. Daniels
7. International Business — Justin Paul

Risk & Value Management

ELECTIVE

Course Code	Theory Course Name	L	T	P	Credits	TWA	IST	ESE	Total	ESE Hours
CE0451	Risk & Value Management	03	-	-	3-0-0	20	20	60	100	03

COURSE OBJECTIVES

Developing the basic knowledge of Risk & Value Management and develop capability to apply such principles for handling complex problems in Project management.

COURSE CONTENT

Project Risks:-Definition, dynamic and static risk, uncertainty and risk. Risk and construction project time, money and technology, the people and the risks, processes and risks, risks and clients, consultants and contractors, risk allocation in contracting.

Human Aspects:- Personnel attitude towards risk, perceptions and risks, individuals and groups, communication in risk management, concept of utility and risks.

Risk management system:- Risk identification, sources of risks, risk classification, types, impact and consequences of risk, risk analysis, Sensitivity analysis, breakeven analysis ,scenario analysis, risk response: retention, reduction, transfer, avoidance.

Qualitative and quantitative methods in risk management:- Qualitative risk assessment, risk register, probability — Impact matrix, project appraisal, cost benefit analysis, Monte- Carlo technique, portfolio theory, Delphi method, influence diagrams, decision trees.

Value Engineering:- Value, Reasons of poor value in constructed facilities, habits, road blocks and attitudes.

Value management:- Value Engineering job plan, function analysis, purpose and implications of life cycle costs, Impact of energy on cost of constructed facilities, managing value engineering study.

Disasters:- Natural and manmade, possible effects, Disaster recovery plan Disaster recovery plan: basic requirements, documenting disaster recovery plan, rehearsing the disaster recovery plan, example disaster recovery plan.

Reference Books

1. N J Smith, Managing Risk in Construction Projects.
2. L W Zimmerman and G D Hart, value Engineering, CBS Publishers.
3. R Flagnan R and G Norman, Risk management and Construction, Blackwell Scientific.
4. Thompson P A and Perry J G, Engineering Construction Risks- A guide to Project risk analysis and risk management, Thomas Telford.