UNIVERSITY OF MADRAS

MASTER OF BUSINESS ADMINISTRATION (MBA) DEGREE PROGRAMME

SYLLABUS WITH EFFECT FROM 2023-2024

934E910: Specialization Courses in Infrastructure Management

Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910A	Introduction to Infrastructure Planning	Elective	3	-	-	-	3	3	25	75	100
934E910B	Strategic Planning for Infrastructure Sectors	Elective	3	-	-	-	3	3	25	75	100
934E910C	Value Engineering	Elective	3	-	-	-	3	3	25	75	100
934E910D	Project Legislations	Elective	3	-	-	-	3	3	25	75	100
934E910E	Project Procurement and Quality Management in Construction	Elective	3	-	-	-	3	3	25	75	100
934E910F	Rural Infrastructure Planning and Management	Elective	3	-	-	-	3	3	25	75	100
934E910G	Environmental Impact and Risk Assessment	Elective	3	-	-	-	3	3	25	75	100
934E910H	Disaster Mitigation and Management	Elective	3	-	-	-	3	3	25	75	100
934E910I	IT Infrastructure Management	Elective	3	-	-	-	3	3	25	75	100
934E910J	Supply Chain Management for Infrastructure	Elective	3	-	-	-	3	3	25	75	100
934E910K	International Infrastructure Management	Elective	3	-	-	-	3	3	25	75	100

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SYLLABUS WITH EFFECT FROM 2023-2024

Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910A	**Introduction to Infrastructure Planning**	Elective	3	-	-	-	3	3	25	75	100

Course Objectives	
C1	To evaluate the different phases in the life cycle of an infrastructure project and role of various management functions in each phase
C2	To Analyse the basic principles of project appraisal and evaluation, and determining feasibility of projects
C3	To Evaluate the basic features of risk and quality management of a project, and the extent that these management areas need to be implemented
C4	To Develop methodologies for economic analysis and ICT usage for various activities involved in infrastructure planning
C5	To Demonstrate the concepts of financial, economic, social and environmental impact and risk associated and to understand and evaluate the environmental impact in an infrastructure project

UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	**Introduction :** Definitions of infrastructure; Typical infrastructure planning steps; Planning and appraisal of major infrastructure projects; Screening of project ideas; Life cycle analysis; Multi-criteria analysis for comparison of infrastructure alternatives	9	C1
II	**Procurement Strategies :** Procurement strategies; Scheduling and management of planning activities; Economic Analysis – Concepts and Applications.	9	C2
III	**Methodologies :**Principles of methodologies for economic analysis of public works, Social welfare function, Indifference curves and tradeoffs, Demand curves and price elasticity's; Benefit-cost ratio and internal rate of return; Shadow pricing; Accounting for risk and uncertainty	9	C3
IV	**Project Risk and Estimation of Cash Flows :** Project cash flows: Conventional and Nonconventional, Project Risk: Elements of Risk – Risk adjusted discounted rate – Estimation of Project Cash flows.	9	C4
V	**Perspectives of Infrastructure Planning** : Political and social perspectives of infrastructure planning; Case studies	9	C5
	Total	**45**	

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Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Critically evaluate the different phases in the life cycle of an infrastructure project and role of various management functions in each phase	PO1, PO2, PO6
CO2	Analyse the basic principles of project appraisal and evaluation, and determining feasibility of projects	PO1,PO2, PO4, PO6, PO7
CO3	Evaluate the basic features of risk and quality management of a project, and the extent that these management areas need to be implemented	PO2, PO4, PO6, PO7
CO4	Develop methodologies for economic analysis and ICT usage for various activities involved in infrastructure planning	PO1,PO2, PO4, PO6, PO7
CO5	Demonstrate the concepts of financial, economic, social and environmental impact and risk associated and to understand and evaluate the environmental impact in an infrastructure project	PO1,PO2, PO4, PO6, PO7

Reading List	
1.	Project scheduling – Probabilisitic and Deterministic (White paper)
2.	Financial Appraisal – Investment of public funds
3.	Risk assessment framework – White paper
4.	A case study of Delhi metro project

References Books	
1.	A. S. Goodman and M. Hastak, Infrastructure planning, engineering, and economics, second edition, McGraw-Hill, New York, 2015.
2.	Vicki Elmer, Infrastructure planning and finance: A smart and sustainable guide, 1st edition, Routledge, 2013.
3.	P. Chandra, Projects: Planning, analysis, selection, financing, implementation, and review, Tata McGraw-Hill, New Delhi, 2009.
4.	J. D. Finnerty, Project financing - Asset-based financial engineering, Wiley publications; 2nd Edition, New York, 2007.
5.	T. J. Webster, Managerial economics: Theory and practices, Elsevier, New Delhi, 2003.
6.	J. Parkin and D. Sharma, Infrastructure planning, Thomas Telford, London, 1999.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3	3				2		
CO 2	2	2		3		3	3	
CO 3		2		2		3	2	
CO 4	3	3		2		2	3	
CO 5	3	2		3		3	3	

3-Strong 2-medium 1-Low

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SYLLABUS WITH EFFECT FROM 2023-2024

Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910B	**Strategic Planning For Infrastructure Sectors**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To create insights on various infrastructure sectors and debate their strengths and weaknesses.
C2	To Investigate and analyse different frameworks used in infrastructure sectors and the variables impacting each sector.
C3	To analyse the systematic process to select and screen a project and design strategies for successful implementation of projects.
C4	To Appreciate the organization setup of infrastructure organization, its participants and ICT usage.
C5	To Evaluate the concept of privatization and challenges in implementing the projects and to Develop strategies for successful implementation of infrastructure projects Possess the knowledge on the fundamentals of spread sheet modeling.

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	**Introduction :** Introduction to infrastructure- Definition and types – An overview of the Power sector- Water supply and Sanitation sector- Road, rail, air and port transportation sectors- telecommunications sector- urban infrastructure- rural infrastructure in India.	9	C1
II	**Organizations and Players** Organizations and players in the field of infrastructure. An overview of infrastructure project finance–procurement process, concession- design and award, financial risk analysis, management and mitigation. Credit rating of infrastructure projects, credit allocation framework for infrastructure projects.	9	C2
III	**Infrastructure Privatization** Private involvement in infrastructure: Infrastructure privatization- benefits of infrastructure privatization-	9	C3

	problems with infrastructure privatization-challenges in privatization of water supply- challenges in privatization of power privatization of infrastructure in India- Privatization of road transportation infrastructure in India.		
IV	**Challenges in Implementation** Challenges to successful infrastructure planning and implementation: Mapping and facing the landscape of risks in infrastructure projects- Economic and Demand risks- Political risks- Socio- Environmental risks- Cultural risks in international infrastructure projects- Legal and contractual issues in infrastructure- Challenges in construction and maintenance of infrastructure.	9	C4
V	**Special economic zones -** Introduction.Infrastructure Strategies -Strategies for successful infrastructure project implementation: risk management framework for infrastructure projects- shaping the planning phase of infrastructure projects to mitigate risks- Designing sustainable contracts- Introduction to fair process and negotiation- Negotiation with multiple stakeholders on infrastructure projects- Sustainable development of infrastructure-Information technology and systems for successful infrastructure management- Innovative design and maintenance of infrastructure facilities- infrastructure modelling and life cycle analysis techniques.	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Critically review various infrastructure sectors and debate their strengths and weaknesses.	PO1, PO2, PO6
CO2	Investigate and analyse different frameworks used in infrastructure sectors and the variables impacting each sector.	PO1, PO2, PO3, PO6
CO3	Demonstrate the systematic process to select and screen a project and design strategies for successful implementation of projects.	PO1, PO2, PO5, PO6, PO7
CO4	Appreciate the organization setup of infrastructure organization, its participants and ICT usage.	PO1, PO2, PO6, PO8
CO5	Evaluate the concept of privatization and challenges in	PO1, PO2, PO6,

	implementing the projects. CO6: Develop strategies for successful implementation of infrastructure projects Possess the knowledge on the fundamentals of spread sheet modeling.	PO7, PO8
Reading List		
1.	Sidney Levy, "Project Management in Construction", McGraw Hill Series, 5th edition, 2006.	
2.	VISION – TAMILNADU 2023 - Strategic plan for Infrastructure Development in Tamilnadu	
References Books		
1.	Hariyappa, "Strategic Planning", Book Tango Publication, 2015.	
2.	John M. Bryson, Strategic planning for public and nonprofit organizations: A guide to strengthening & sustaining organizational achievements, 5th edition, 2014	
3.	Richard Lambeck, John Eschemuller, "Urban Construction Project Management", McGraw Hill Series, 2009	
4.	Antony Walker, "Project Management in Construction", Willy Blacwell, 5th edition, 2007	
5.	David I. Cleland and Roland Gareis, "Global Project Management Handbook: Planning, Organization and Controlling International Projects", 2nd edition, McGraw Hill Series, 2006	

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3	3				2		
CO 2	2	3	3			3		
CO 3	3	2			3	3	3	
CO 4	3	3				2		2
CO 5	3	3				3	2	2

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SYLLABUS WITH EFFECT FROM 2023-2024

Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910C	**Value Engineering**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To Understand the basics of Value Engineering (VE) and value analysis, its methodology and methods for appropriate time.
C2	To Develop and demonstrate the "function analysis" for infrastructure projects
C3	Appreciate various factors for projects selection and develop an appropriate project.
C4	To Induce creative thinking in judgment of various factors project success and effective usage of ICT.
C5	To Create alternative solutions for the future with optimal selection or sorting using creative thinking and functional relationships and analyse the factors for project selection, estimation, and creative thinking in the field of value engineering.Have insights on functions of marketing

UNIT	Details	No. of Hours	Course Objectives
I	Introduction Value Engineering (VE) and Value Analysis (VA) - Life Cycle of a product-Methodology of value engineering – Difference from the conventional methods of cost reduction-necessary costs reasons- Quantitative definition of value- Use value and Prestige value.	9	C1
II	**Functions**:Estimation of product Quality/performance-Types of functions- Relationship between Use functions and Esteem Functions in product design – Functional cost and Functional Worth –Effect of Value improvement on profitability-Test for poor value –Aims of Systematic Approach. Functional approach to value improvement-various phases and techniques of Job Plan	9	C2
III	**Project Selection Concepts :**Factors governing project selection – Types of Projects-Life Cycle Costing (LCC) for managing the Total Value- Concepts in LCC.	9	C3
IV	**Creative Thinking:** Creative thinking and creative judgment-positive or constructive discontent- Tangible and Intangible costs of implementation - False material - labour and overhead saving – Relationship between savings and probability of success.	9	C4
V	**Functional Relationships:**Type of costs- Function Phase – Evaluation of Functional Relationships- Checks for consistency - Function – cost-weight - matrix - VIP Index – High cost and Poor value areas - Creativity/Speculation Phase – Rules of	9	C5

	creativity – Idea activators- Result accelerators – Evaluation Phase – Estimation of costs of ideas- Evaluation by comparison.		
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Understand the basics of Value Engineering (VE) and value analysis, its methodology and methods for appropriate time.	PO4, PO5
CO2	Develop and demonstrate the "function analysis" for infrastructure projects	PO2, PO4, PO5
CO3	Appreciate various factors for projects selection and develop an appropriate project.	PO1, PO2, PO4, PO5
CO4	Induce creative thinking in judgment of various factors project success and effective usage of ICT.	PO2, PO4, PO5, PO6, PO7
CO5	Create alternative solutions for the future with optimal selection or sorting using creative thinking and functional relationships. Critically analyse the factors for project selection, estimation, and creative thinking in the field of value engineering.	PO1, PO2, PO4, PO5, PO6, PO7

Reading List	
1.	Larry W. Zimmerman, Glen D. Hart, value engineering, CBS publications, 1st edition, 2010
2.	Arthur E Mudge, "Value Engineering – A Systematic Approach", McGraw Hill Book Company, 1971.
References Books	
1.	Anil Kumar Mukhopadhyaya, "Value Engineering: concepts, Techniques and applications", Sage Publications, 2014.
2.	Robin Cooper, Regine Slagmulder, "Target Costing and Value Engineering", Productivity Press, New York, 2017
3.	Richard J Park, "Value Engineering – A Plan for Inventions", CRC Press, 2017.
4.	A.D. Raven, Profit Improvement through Value Analysis, Value Engineering and Purchase Price Analysis, Cassell and Co. London, 2007.
5.	S S Iyer," Value Engineering – A How to Manual", 3rd edition, New Age Publishers,Chennai, ISBN: 978-81-224-2405-8, 2006.
6.	Larry W. Zimmerman, Glen D. Hart, value engineering, CBS publications, 1st edition, 2010

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1				3	2			
CO 2		3		2	3			
CO 3	2	2		3	3			
CO 4		3		3	2	3	3	
CO 5	3	3		2	3	3	2	

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Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910D	**Project Legislations**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To create awareness on the basics of constitution, nature of contracts, including rights and duties of owners and non-owners.
C2	To evaluate about the infrastructure policies, reforms and laws in various sectors.
C3	To throwlight on the negotiable instruments, partnership, consumer protection and cyber laws.
C4	To elucidate the nature of corporate secretarial practices followed in the companies.
C5	To create understanding on the mechanics of governance, jurisdiction, its structure and functions Understand and practice the policies, laws and reforms related to various sector

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	Introduction: Constitutional law - Allocation of jurisdiction over different infrastructure sectors between the Centre and State - Law making powers Administrative Law.Role of Centre and State in policy formulation – Central funding of infrastructure projects – central oversight and interference; ESI – Consent to establish – Consent to operate	9	C1
II	**Private Participation :**Investment requirements – non ideological factors leading to commercialisation and privatisation of infrastructure - from socialism to market driven economy - legal framework for private sector participation – modes of Public Private Partnership (PPP) - dispute settlement clauses in concession agreements	9	C2
III	**General legal context :**General Framework on environmental regulation and guidelines- Coastal Zone Regulation - Forest (Conservation) Act -Environmental Impact Assessment - Role of judiciary - Land Acquisition – Rehabilitation and resettlement	9	C3
IV	**Mechanism of Governance :**Theories of regulation - genesis of Independent regulation - evolution of regulation	9	C4

	in different jurisdictions - Design and structure of regulators – scope and functions - regulatory process - and regulatory autonomy and accountability - regulatory predictability and certainty Regulatory law in India		
V	**Infrastructure Sector polices, reforms, and laws:** Power Sector/Electricity – Introduction - evolution of the power sector reforms, polices-National Electricity policy-new legal framework- the state electricity boards-licensing framework- Provisions Relating to and working of Electricity Regulatory Commissions-their structure, role and functions. Telecommunications - The national telecom policies - the legal framework - Reforms – Policies Oil, Petroleum and Natural Gas - Reforms, policies and legal framework - New Exploration Licensing Policy (NELP) - production sharing contracts- the new Petroleum Regulatory and Natural Gas Board Act – the emerging regulatory reforms,Transport – Law, policy and reforms relating to Airports – Railways - Road – Port/TAMP and an overview of coastal shipping and Inland Water Transport policy	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Understand the basics of constitution, nature of contracts, including rights and duties of owners and non-owners.	PO1, PO6
CO2	Critically evaluate about the infrastructure policies, reforms and laws in various sectors.	PO1, PO4, PO6
CO3	Appreciate the negotiable instruments, partnership, consumer protection and cyber laws.	PO1, PO2, PO4, PO5, PO6
CO4	Demonstrate the nature of corporate secretarial practices followed in the companies.	PO1, PO2, PO4, PO5, PO6, PO7
CO5	Understand the mechanics of governance, jurisdiction, its structure and functions Understand and practice the policies, laws and reforms related to various sector	PO1, PO2, PO4, PO6, PO7, PO8

Reading List	
1.	S K Sarkar, Leena Srivastava (ed), Reforms in the Infrastructure Sectors: Next Steps, New Delhi: TERI (2002).
2.	S Sundar & SK Sarkar (2000), Framework for Infrastructure Regulation, New Delhi: TERI.

References Books	
1.	I.P Massey, Administrative Law, Lucknow: Eastern Book Company, 2017.
2.	Piyush Joshi, Law Relating to Infrastructure Projects, New Delhi: Lexis Nexis Publication, 2014
3.	Saravanavel, P. and S. Sumathi, Legal aspects of Business, Himalaya Publishing House, Mumbai, 2012.
4.	D D Basu, The Constitutional Law of India, New Delhi: Lexis Nexis Butterworths, 2009.
5.	Sidney Shapiro & Joseph Tomain, Regulatory law and policy: Cases and Materials LexisNexis, 3rd Edition, 2003

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3					3		
CO 2	3			3		2		
CO 3	2	3		3	2	3		
CO 4	3	2		2	3	3	3	

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Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910E	**Project Procurement And Quality Management In Construction**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To create awareness on the procurement process of the company.
C2	To throw light on Initiating and closing the contract for procurement.
C3	To Analyse and implement the quality aspects in construction industry.
C4	To Initiate and execute the process of quality certification
C5	To Demonstrate the safety and create awareness of the safety in an industry and Effectively use the ICT for the procurements process and quality assurance

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	Introduction Introduction to procurement systems; Common Variants of Main Procurement Systems; Separated Procurement Systems; Integrated Procurement Systems; Management-Oriented Procurement Systems - Management contracting, Construction management; Design and manage; Discretionary Procurement Systems; Project partnering; Strategic partnering	9	C1
II	**Project Contracts :** Project Alliancing; Relational Contracting; Contract Administration – Contract Management – Project Procurement Process – Organisational Design – Issues in Procurement Systems: Cultural, Social, legal and technological.	9	C2
III	**Quality Control** Introduction to quality – Importance of quality – Quality transition - quality control and inspection, quality assurance – Quality management: Evaluation – Planning - Control and design of structures.	9	C3
IV	**ISO Standards** Inspection of materials and machinery; Quality assurance in construction; Systems quality management; Quality standards/codes in design and construction; (ISO:9000); Total quality management (TQM) - principles, tools and	9	C4

	techniques.		
V	**Safety in Construction Industry** Introduction to safety; Safety and health programmes, safety provisions; construction hazards, accidents and safety guidelines; Accidents prevention techniques - Site management with regard to safety recommendations – Safety awareness and implementation.	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Manage the procurement process of the company.	PO1, PO2, PO4
CO2	Initiate and close the contract for procurement.	PO1, PO2, PO3, PO4
CO3	Analyse and implement the quality aspects in construction industry.	PO1, PO2, PO4, PO5
CO4	Initiate and execute the process of quality certification	PO2, PO4, PO5, PO6, PO8
CO5	Demonstrate the safety and create awareness of the safety in an industry. Effectively use the ICT for the procurements process and quality assurance	PO1, PO2, PO4, PO5, PO6, PO7

Reading List	
1.	J. W. E. Masterman, An introduction to building procurement systems, Taylor & Francis, London, 2002.
2.	B. G. Dale, Managing quality, 4th ed., Blackwell Publishing, Oxford, 2003.
References Books	
1.	F. Harris, R. McCaffer and F. Edum-Fotwe, Modern construction management, 6th ed., Blackwell Publishing, Oxford, 2006.
2.	Abdul Razzak Rumane, "Quality management in Construction Projects", CRC Press, Newyork, 2016.
3.	D. Walker and S. Rowlinson, Procurement systems - A cross-industry project management perspective, Spon, London, 2008.
4.	C. D. Reese and J. V. Eidson, Handbook of OSHA construction safety and health, 2nd ed. CRC Press, Boca Raton, 2006.
5.	D. Walker and K. Hampson, Procurement strategies - A relationship-based approach, Blackwell Publishing, Oxford, 2003.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3	3		2				
CO 2	2	3	3	3				
CO 3	3	2		3	3			
CO 4		3		3	2	3		3
CO 5	3	2		3	3	3	3	

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Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910F	**Rural Infrastructure Planning & Management**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To analyse the need and importance of rural infrastructure.
C2	To evaluate the infrastructure required for agriculture and other rural allied sectors.
C3	To throw light on the development of rural infrastructure development to national development.
C4	To identify the opportunities available in rural infrastructure development.
C5	To Develop projects relating to rural infrastructure development and Develop strategies, procedures and policies related to infrastructure for the uplift of rural community.

SYLLABUS			
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	Introduction Nature, scope, need and importance of infrastructure planning for rural area. Concept, approaches, issues to provide infrastructure for rural settlement.	9	C1
II	Infrastructure for Agriculture Infrastructure inputs for agriculture; Importance, features, problems of agriculture; Classification of land, Change in land utilization pattern, Farm mechanization, Pesticides, Fertilizers.	9	C2
III	Infrastructure for Allied activities Public distribution system – Marketing system – Infrastructure for processing – grading – packing. Irrigation means, their relative importance & network systems – Infrastructure for Allied activities – Forestry – Animal husbandry – Poultry – Fisheries – Piggeries – Sericulture – Beekeeping. Infrastructure for water logging and soil erosion.	9	C3
IV	Infrastructural Development Infrastructure to provide energy – Fuel and electricity network for developing rural areas. Raw materials distribution centres for handicrafts and rural industries. Tourism potential and heritage in rural places.	9	C4
V	Infrastructure for Different Sectors	9	C5

	Education – Health – Water Supply – Seweage – Recreational points of social interaction – Provision for banks – Cooperatives – Policies & Programmes.		
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Realize the need and importance of rural infrastructure.	PO2, PO3, PO4
CO2	Demonstrate the infrastructure required for agriculture and other rural allied sectors.	PO1, PO2, PO4, PO6, PO7
CO3	Relate the development of rural infrastructure development to national development.	PO3, PO4, PO5, PO6, PO7
CO4	Understand opportunities available in rural infrastructure development.	PO3, PO4, PO7
CO5	Develop projects relating to rural infrastructure development and Develop strategies, procedures and policies related to infrastructure for the uplift of rural community.	PO3, PO4, PO7, PO8

Reading List	
1.	Jain, Gopal Lal, (2001), Rural Development, Knowledge Publications, New Delhi.
2.	Bhatia, B.M., (1988), Indian Agriculture: A Policy Perspective. Sage Publications, New Delhi
References Books	
1.	Lekhi, R. K. and Joginder Singh, Agriculture Economics – An Indian Perspective, 11th edition, Kalyani Publishers, New Delhi, 2016
2.	Greg Halseth, Sean Markey, Laura Ryser, "Service Profession and Rural Sustainability Infrastructure and Innovation", Routledge Publication, newyork, 2019.
3.	Gaurav Datt & Ashwani Mahajan, "Datt & sundharam., Indian Economy", 70th Revised Edition, S. Chand, New Delhi, 2016.
4.	Pingali Venugopal, Ram Kaundinya,"Agri Input marketing in India', Sage Publications, New Delhi, 2014
5.	Bhargaw, G., Development of India's Urban, Rural and Regional Planning in 21st Century Policy Perspective, Gyan Publishing House, New Delhi, 2001.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1		3	2	3				
CO 2	3	2		2		3	3	
CO 3			3	3	3	2	3	
CO 4			3	3			2	
CO 5			3	3			3	3

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Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910G	**Environmental Impact And Risk Assessment**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To understand the basics of environmental impact assessment and its Legal and Regulator Aspects in India
C2	To demonstrate the purpose, process and limitations of EIA in the decision-making process.
C3	To Understand and evaluate the components of EIA and usage of ICT in analyzing the assessment of environmental risk.
C4	To Adopt, plan and apply commonly used environmental impact assessment methodologies and methods and develop their own methods.
C5	To Develop, prepare, implement rehabilitation plans aligned with policies and guidelines to safeguard environment and to Understand the environmental risk assessment framework and assess socio-economicimpact and environmental risk impact

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	Introduction: Basic fundamentals: Historical Development of Environmental Impact Assessment-EIA in Project Cycle-Legal and Regulatory Aspects in India-Types and Limitations of EIA-Cross sectoral Issues and terms of references in EIA.	9	C1
II	Components of EIA**:** Components of EIA environmental risk assessment: EIA Process-Screening and Scoping-Public Participation in EIA-Mitigation. Methodology: Methods for Environmental assessment-Matrices &Networks-Checklists- Cost benefit analysis-Analysis of Alternative-Software Packages for EIA and Expert Systems in EIA.	9	C2
III	Prediction and assessment**:** Prediction tools for EIA - Mathematical modeling for impact prediction-Assessment of Impacts on Air and Water-Assessment of Impacts on Soil and Noise - Assessment of Impacts on Biological Community-	9	C3

	Cumulative Impact Assessment-Documentation of EIA Findings & Report Preparation.		
IV	Socio-economic impact assessment**:** Socio-economic impact assessment**:** Definition of Social Impact Assessment-Social Impact Assessment model and the --planning process-Relationship between social impacts and change in community and institutional arrangements-Individual and family level impacts –Communities in transition. Environmental management plan: Environmental Management Plan – Preparation and implementation and Rehabilitation plans-Policy and guidelines for planning and monitoring programmes - Post Project Audit-Ethical and Quality aspects of Environmental Impact Assessment—case studies.	9	C4
V	**Environmental risk assessment:**Environmental risk assessment framework-Hazard identification - Dose Response Evaluation – Exposure Assessment – Exposure Factors, Tools for Environmental Risk Assessment– HAZOP and FEMA methods – Event tree and fault tree analysis - Risk Characterization Risk communication - Emergency Preparedness Plans –Design of risk management programs.	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Understand the basics of environmental impact assessment and its Legal and Regulator Aspects in India	PO1, PO6
CO2	Critically demonstrate the purpose, process and limitations of EIA in the decision-making process.	PO1, PO4, PO6
CO3	Understand and evaluate the components of EIA and usage of ICT in analyzing the assessment of environmental risk.	PO1, PO2, PO4, PO5, PO6
CO4	Adopt, plan and apply commonly used environmental impact assessment methodologies and methods and develop their own methods.	PO1, PO2, PO4, PO5, PO6, PO7
CO5	Develop, prepare, implement rehabilitation plans aligned with policies and guidelines to safeguard environment and	PO1, PO2, PO4, PO6, PO7, PO8

	to Understand the environmental risk assessment framework and assess socio-economic impact and environmental risk impact	
Reading List		
1.	Canter L.W., "Environmental Impact Assessment", McGraw Hill, New York, 1996	
2.	Risk Assessment Framework for Project Management, IEMC 2006	
References Books		
1.	Anjaneyalu, Vallimanaickam, Environmental Risk Assessment methodologies, B.S publications, 2nd edition, 2011.	
2.	Stephen Tromans, Environmental impact assessment, Bloomsburg publishing, 2012	
3.	Peter Wathern, Environmental Impact Assessment: Theory & Practice, Routledge publisher, 2015	
4.	Lawrence, D.P., "Environmental Impact Assessment – Practical Solutions to recurrent problems", Wiley-Interscience, New Jersey, 2003.	
5.	Petts J., "Handbook of Environmental Impact Assessment', Vol., I and II, Blackwell science, London, 1999	

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SYLLABUS WITH EFFECT FROM 2023-2024

Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910H	**Disaster Mitigation And Management**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To provide insights on the difference between hazard, disaster, Disaster Management Policy,Procedure and Institutional Mechanism
C2	To Analyse and evaluate the environmental, social, cultural, economic, legal factors of disaster
C3	To Evaluate the environmental, social, cultural, economic, legal and organisational aspects influencing vulnerabilities and capacities to face disasters.
C4	To evaluate protection measures during disaster, flood, landslide and avoiding damages to building by strengthening existing and restoration.
C5	To Generate protection measures during landslide and strengthening existing and restoration and to develop the framework for the disaster management & disaster mitigation and effective usage of ICT in disaster management

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	Introduction : Difference between hazards and disaster – Types of disasters-Phases of disaster Management - Hazards -Classification of Hazards - Hazards affecting buildings - Building safety against hazards – Floods – Cyclone – Landslides –Tsunami and Fire. Disaster Management Policy and Procedure – legal frame work – Institutional Mechanism –Schemes and Grants on DM	9	C1
II	**Earthquake Disaster:** Earthquake Disaster - Earthquake Hazard Map -Causes of Earthquakes -Classification of Earthquakes - -Seismic waves -Energy release - Inertia forces, Natural period -Resonance, Damping -Seismic response of free vibration -Seismic response of damped vibration	9	C2
III	**Protection Measures:** Landslides **–** Floods **–** Tropical cyclones - Tsunami - Mitigation strategies	9	C3
IV	**Hazard Assessment:** Vulnerability Assessment **–** Hazard Assessment **–** Seismic Strengthening of Buildings-Repairs Restoration Strengthening of Existing Buildings Strengthening Materials-Retrofitting of Load Bearing Wall Buildings Retrofitting of RC Buildings.	9	C4
V	**Land use Zoning Regulations & Quality**	9	C5

	control: Introduction-Community planning Community Contingency plan –Report building and initial awareness- Recommendations For Land use Zoning Regulations - -Construction Quality Control - Evolution of Quality Management - Reasons for poor construction -Construction of Quality control in Masonry Structures.		
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Understand the difference between hazard, disaster, Disaster Management Policy,Procedure and Institutional Mechanism	PO2, PO4, PO6
CO2	Analyse and evaluate the environmental, social, cultural, economic, legal factors of disaster	PO1, PO2, PO4, PO6
CO3	Evaluate the environmental, social, cultural, economic, legal and organisational aspects influencing vulnerabilities and capacities to face disasters.	PO1, PO2, PO4, PO6
CO4	Critically evaluate protection measures during disaster, flood, landslide and avoiding damages to building by strengthening existing and restoration.	PO1, PO2, PO4, PO6, PO7
CO5	Generate protection measures during landslide and strengthening existing and restoration. Develop the framework for the disaster management & disaster mitigation and effective usage of ICT in disaster management	PO1, PO2, PO4, PO6, PO7

Reading List	
1.	Ayaz Ahmad, “Disaster Management: Through the New Millennium”, Anmol Publications, 2003.
2.	Sahni, Pardeep et.al. (eds.), Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi. 2002

References Books	
1.	Rajan Kumar Sahoo, Management and Mitigation of Natural Disaster, Regal Publications, 1st edition, 2014.
2.	Dr. U.Sai jyoti, SIA Expert, Disaster management and mitigation, JNTU-A, SIA Publisher, 2018
3.	Singh R.B, “Disaster Management”, Rawat Publications, 2008.
4.	Ghosh G.K. “Disaster Management”, A.P.H. Publishing Corporation, 2006
5.	Goel, S. L. “Encyclopaedia of Disaster Management”, Deep & Deep Publications Pvt Ltd., 2006

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1		3		3		2		
CO 2	3	3		2		3		
CO 3	3	2		3		3		
CO 4	3	3		3		3	2	
CO 5	2	3		3		3	3	

3-Strong 2-medium 1-Low

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SYLLABUS WITH EFFECT FROM 2023-2024

Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910I	**IT Infrastructure Management**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To identify and estimate and develop the ICT requirements for infrastructure management.
C2	To describe the business value and processes of ICT services in an organisation and apply that knowledge and skill with initiative to a workplace scenario.
C3	To Evaluate how effective IT Infrastructure Management requires strategic planning with alignment from both the IT and business perspectives in an organization
C4	To create insights and to demonstrate the technical and communications skills that contribute to the operation of ICT services in an organisation
C5	To Improve the effective methods for storage, recovery and managing the data for an organization and Understand and develop security, firewall and intellectual property

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
1	Introduction: Definition - Infrastructure Management Activities - Evolutions of Systems (Mainframes-to-Midrange-to-PCs-to-Client-Server Computing-to-New Age Systems) - Growth of Internet - Current Business Demands and IT System Issues - Complexity of Today's Computing Environment - Value of Systems Management for Business.	9	C1
II	**Designing:**Factors to Consider in Designing IT Organizations And IT Infrastructure - Determining Customer's Requirements - Identifying System Components to Manage - Exist Processes - Data - Applications - Tools and Their Integration - Patterns for IT Systems Management - Introduction To The Design Process For Information Systems – Models - Information Technology Infrastructure Library (ITIL).	9	C2
III	**System Management and Computing Environment:** Common Tasks in IT System Management - Approaches for Organization Management - Models in IT System Design - IT Management Systems Context	9	C3

	Diagram - Patterns For IT System Management; Complexity of Current Computing - Multiple Technologies - Multiple Vendors - Multiple Users - e-Waste Disposal - Total Cost of Ownership.		
IV	**Storage Management:** Introduction - Types - Benefits - Backups - Archive - Recovery - Disaster Recovery - Space Management - Hierarchical Storage Management - Network Attached Storage - Storage Area Network - Bare Machine Recovery - Data Retention - Database Protection	9	C4
V	**Security**: Introduction Security - Identity Management - Single Sign-On - Access Management. Basics Of Network Security - LDAP Fundamentals - Intrusion Detection - Firewall - Security Information Management - Introduction To Cyber Ethics - Intellectual Property - Privacy and Law - Computer Forensics - Ethics And Internet - Cyber Crimes	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Estimate and develop the ICT requirements for infrastructure management.	PO1, PO2, PO6, PO7
CO2	Describe the business value and processes of ICT services in an organisation and apply that knowledge and skill with initiative to a workplace scenario.	PO2, PO4, PO6
CO3	Evaluate how effective IT Infrastructure Management requires strategic planning with alignment from both the IT and business perspectives in an organization	PO2, PO4, PO6
CO4	Demonstrate the technical and communications skills that contribute to the operation of ICT services in an organisation	PO2, PO4, PO6
CO5	Improve the effective methods for storage, recovery and managing the data for an organization and Understand and develop security, firewall and intellectual property	PO2, PO4, PO6

Reading List	
1.	Kenneth C Laudon, Jane P Laudon, ―Management Information Systems. Managing the digital firm, 13th edition, Pearson education ltd., Delhi, 2017.
2.	Information systems Journal – Wiley Online Library.
References Books	
1.	Phalguni Gupta, Surya Prakash and Umarani Jayaraman, "IT Infrastructure and its Management", Tata McGraw Hill Education Pvt. Ltd., New Delhi – 2009
2.	Rich Schiesser, IT Systems Management, Prentice Hall Publication, 2nd edition, 2010.

3.	James A O'Brien, ―Management Information Systems, 10th edition, Tata Mc Graw Hill, 2011.
4.	E Turban, E Mclean and James C. Wetherbe, ― Information Technology for Management: Transforming Organizations in the digital economy, 6th edition, John Wiley and sons Ltd., Newyork, United States
5.	Sharma S, "IT Infrastructure And Its Management", Vayu Education Of India, 2012

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3	3				2	3	
CO 2	3	3				3		
CO 3	3	2				3		
CO 4	2	3				3		
CO 5	3	3				3		

3-Strong 2-medium 1-Low

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SYLLABUS WITH EFFECT FROM 2023-2024

Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910J	**Supply Chain Management For Infrastructure**	Elective	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To create knowledge on complex qualitative and quantitative data to support strategic and operational decisions of supply chain.
C2	To develop comprehensive strategic and tactical plans for supply chain management
C3	To generate creative, critical and reflective thinking to address organizational opportunities and challenges in supply chain.
C4	To Improve appropriate technologies in developing solutions to business opportunities and challenges in supply chain.
C5	To Analyze, forecast the demand and serve the customer accordingly and Identify and develop ICT for effective implementation of supply chain

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	**Introduction to Supply Chain Management**. Supply chain – objectives – importance – decision phases – process view – competitive and supply chain strategies – achieving strategic fit – supply chain drivers – obstacles – framework – facilities – inventory – transportation – information – sourcing – pricing, pricing, Key issues and benefits of SCM.	9	C1
II	**Designing the Supply Chain Network.** Designing the distribution network, role of distribution, factors influencing distribution, design options, distribution networks in practice, network design in the supply chain, factors affecting the network design decisions. Designing and Planning Transportation Networks, role of transportation, modes and their performance, transportation Infrastructure and policies, design options and their trade-offs, tailored transportation	9	C2
III	**Designing the Supply Chain Network.** Designing the distribution network, role of distribution, factors influencing distribution, design options, distribution networks in practice, network design in the	9	C3

	supply chain, factors affecting the network design decisions. Designing and Planning Transportation Networks, role of transportation, modes and their performance, transportation Infrastructure and policies, design options and their trade-offs, tailored transportation		
IV	**Information Technology in the supply chain.** IT Framework – customer relationship management – internal supply chain management – supplier relationship management –transaction management, RFID, EDI – future of IT. –collaborative planning, forecasting and replenishment, Role of computer/ IT in supply chain management.	9	C4
V	**Coordination in a Supply Chain:** Lack of supply chain coordination and the Bullwhip effect – obstacle to coordination – managerial levers – building partnerships and trust – continuous replenishment and vendor-managed inventories (VMI). Demand Management and Customer Service: Logistics costs, Logistics activities and elements, Outbound to customer logistics systems – Demand Management – Traditional Forecasting – Collaborative Planning Forecasting Replenishment Planning (CPFRP) – customer service – expected cost of stock outs – channels of distribution.	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Evaluate complex qualitative and quantitative data to support strategic and operational decisions of supply chain.	PO1, PO2, PO4
CO2	Develop comprehensive strategic and tactical plans for supply chain management	PO1, PO2, PO4
CO3	Generate creative, critical and reflective thinking to address organizational opportunities and challenges in supply chain.	PO1, PO2, PO4
CO4	Improve appropriate technologies in developing solutions to business opportunities and challenges in supply chain.	PO1, PO2, PO4, PO6
CO5	Analyze, forecast the demand and serve the customer accordingly and Identify and develop ICT for effective implementation of supply chain	PO1, PO2, PO4, PO6

Reading List	
1.	Gordon S. Linoff , Michael J. A. Berry,Data Mining Techniques: For Marketing,

	Sales, and Customer Relationship Management , Wiley,2011
2.	Journal of Supply Chain Management, Wily Publications
References Books	
1.	Agarwal DK, A text book of logistics and supply chain management, - 1st edition, macmillan, 2008.
2.	Donald J Bowersox, Dand J Closs, M Bixby Coluper, Supply Chain Logistics Management, 2nd Edition, TMH, 2008.
3.	Chopra Sunil and Peter Meindl Supply chain management, - 3rd edition, Pearson, 2007.
4.	Coyle, Bardi, Longley The Management of Business Logistics – A supply Chain Perspective:, Thomson Press, 2006.
5.	B.S. Sahay, Supply Chain Management, Macmillan, Pearson Education, 2004
6.	

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1	3	3		2				
CO 2	3	2		3				
CO 3	2	3		3				
CO 4	3	3		3		2		
CO 5	3	3		3		3		

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Subject Code	Subject Name	Category	L	T	P	O	Credits	Inst. Hours	Marks		
									CIA	External	Total
934E910K	**International Infrastructure Management**	3	3	-	-	-	3	45	25	75	100

Course Objectives	
C1	To Evaluate the international environment and related issues of infrastructure management.
C2	To analyse the impact of LPG in infrastructure management
C3	To analyse the international quality standards of infrastructure projects and implement them.
C4	To Design infrastructure for international business. Understand various world class manufacturing techniques and use it effectively in their projects
C5	To Create strategies for competitive advantage and effective use of ICT.

	SYLLABUS		
UNIT	**Details**	**No. of Hours**	**Course Objectives**
I	**Introduction** Evolution of International Business (IB)-Nature of IB-Drivers of globalization- Routes of globalization. Globalization: Boon or Bane?-Goals of IB-Differences between domestic business and IB-stages of internationalization –Advantages and limitations and challenges of entering IB- Players in IB.	9	C1
II	**International Business Environment-** Socio-Cultural environment, Political environment, Legal environment and dispute settlement mechanism, Technological Environment, Economic environment, natural environment. Global Strategic Management and Multinational Enterprises- Role of strategy- choice of strategy-Global Market Entry Strategies- Justin's Globe-Hex Model: Strategies for success.	9	C2
III	**Organizational Design for IB :**Factors affecting global design – product design –area design –functional design – division structure	9	C3
IV	**International operations management:** Operations management and competitive advantages – strategic issues – strategic role of foreign plants – international logistics – managing service operations - International R&D-Managing Technology Transfers	9	C4

V	**International Contributions to World class manufacturing** Japanese management overview- management style - employee involvement - drawbacks of Japanese management. Japanese manufacturing techniques- JIT- eliminating waste and adding value- the seven wastes- value added manufacturing. Total quality control - Deming's contributions to TQC. Application of Japanese manufacturing in the US.	9	C5
	Total	**45**	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	**Program Outcomes**
CO1	Evaluate the international environment and related issues of infrastructure management.	PO2, PO3, PO4
CO2	Critically analyse the impact of LPG in infrastructure management	PO2, PO3, PO7
CO3	Analyse the international quality standards of infrastructure projects and implement them.	PO3, PO4, PO7, PO8
CO4	Design infrastructure organization for international business	PO2, PO3, PO4, PO7, PO8
CO5	Create strategies for competitive advantage and effective use of ICT. Understand various world class manufacturing techniques and use it effectively in their projects	PO2, PO3, PO4, PO7, PO8

Reading List	
1.	Production and Operations Management, Concepts, models and Behaviour, Everett E. Adam, Jr. & Ronald J. Ebert, PHI Learning, 5th Edition, 2010.
2.	Global Business, Czinkota, etal, Dryden Press, 8th Edition, 2009
References Books	
1.	International Business, Charles W.L. Hill, McGraw-Hill, 10th Edition, New Delhi, 2013..
2.	International Business, Darrell Mahoriy, etal, Longman, PHI, 11th Edition, 2015
3.	International Business Environments and Operations, John D. Daniels, etal, Pearson Education, 11th Edition, 2015
4.	International Business, Justin Paul, PHI Learning, 6th Edition, New Delhi, 2013.
5.	International Business, Aswathappa K, Tata McGraw Hill, 4th Edition, New Delhi, 2010.

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**
CO 1		3	3	2				
CO 2		3	3				2	
CO 3			3	3			3	2
CO 4		2	3	3			3	3
CO 5		3	2	3			3	3

3-Strong 2-medium 1-Low