M. Tech. -Open Elective Course for All Stream PG Students				
Course code: Course Title -OEC	**Course Structure. Credit=4**			**Pre-Requisite**
OCE 601: Economic and Social Resilience Through Sustainable Infrastructure	**L**	**T**	**P**	**Nil**
	3	1	0	

Course Objective: Fostering students' competence in assessing risks, importance of socio-economic dynamics and infrastructural sustainability.

S. No	**Course Outcomes (CO)**
CO1	Introduction to the impacts of disasters, sustainability framework and their risks on infrastructure.
CO2	To prepare students for Infrastructure for a Climate-Resilient Future.
CO3	Estimating losses from multi-hazard using available tools including software and mitigating effects.
CO4	Modelling risk in view of societal impact.
CO5	Students are able to assess the impact of hazards and other agents on society in terms of sustainability parameters/ metrics.

S. No	**Contents**	**Contact hours**
UNIT 1	Introduction: Sustainable Development Goals (SDGs), Intersection of disasters, society, policy, infrastructure, and the environment; Private and public infrastructure in the frame work of Sustainable Development Goals.	8
UNIT 2	Risk and resilience . Infrastructure for a Climate-Resilient Future. Closing the climate resilience gap in, Infrastructure, New Strategies for Strengthening Infrastructure Resilience and Maintenance. Individual response to risk, Modelling risk.	8
UNIT 3	The emergency management cycle, Structural fragility, software tools and database for assessment of hazard. System-level post-disaster operability, gathering situational awareness for resilience, recovery and resilience, Interdependent infrastructure, Hazard memory and education.	9
UNIT 4	Resilience of Social-Infrastructural Systems: Functional Interdependencies Analysis, Identification of interdependencies identified within Urban subsystems. Sociological concepts and methods, man and environment relationships, socio-economic profile of Indian society and urban transformation, traditions and modernity in the context of urban and rural settlements.	9

UNIT 5	Sustainable economic growth and development related to infrastructure projects, Quality of life, Human development index, Employment and livelihood, Economic principles of land use planning, Policies and strategies of economic planning, Balanced vs. unbalanced growth, an holistic view.	8
	TOTAL	42

R**EFERENCES**		
S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Infrastructure System Resilience: An Engineering Framework for Assessment, Management, and Governance, Ed: Craig Davis, ASCE.	2023
2	Hazard-Resilient Infrastructure: Analysis and Design, Ed: Bilal M. Ayyub, ASCE, MOP 144, ISBN (print):9780784415757, ISBN (PDF):9780784483442.	2021
3	Lifelines-The-Resilient-Infrastructure-Opportunity, Hallegatte S. et al., International Bank for Reconstruction and Development / The World Bank.	2019
4	Resilience in Infrastructure Systems: A Comprehensive Review, Liu W. Et al, *Buildings* 2022, *12*(6), 759; https://doi.org/10.3390/buildings12060759	2022
5	C. Dorland, M. A. van Drunen, R. Lasage, "Climate Change in Developing Countries", CABI Pub., (ISBN: 9781845930776, 1845930770)	2021
6	Building resilience: New strategies for strengthening infrastructure resilience and maintenance, OECD Public Governance Policy Papers, No. 05, OECD, Paris.	2021