தமிழ்நாடு மத்தியப் பல்கலைக்கழகம்

CENTRAL UNIVERSITY OF TAMIL NADU

तमिलनाडु केन्द्रीय विश्वविद्यालय

ESTABLISHED BY AN ACT OF PARLIAMENT IN 2009

OPEN ELECTIVES

(Academic Year 2025-2026 onwards)

Department of Geography

School of Earth Sciences

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LIST OF OPEN ELECTIVE COURSES OFFERED

(TO OTHER DEPARTMENTS)

Sl. No	COURSES			ASSESSMENT	
	Code	Title	Credits	CIA	ESE
1	GEO25OE01	Basics of Geoinformatics	3	40	60
2	GEO25OE02	Fundamentals of Geography	3	40	60
3	GEO25OE03	Rural Development	3	40	60
4	GEO25OE04	Conservation of Natural Resources	3	40	60

NOTE:

Any two of the above listed courses will be offered for every semester depending upon the preference and availability of the faculty-in-charge.

The course will be offered only if the total number of students opts for the specific course is equal or more than five.

Credits: 3 Course Code: GEO25OE01

BASICS OF GEOINFORMATICS

Learning Outcomes:

Upon completion of the course, the students will be able to

1. *Gain knowledge of the basics of Geoinformatics and appreciate the amalgamation of science*
2. *Understand the fundamental concepts of remote sensing, geographic information systems and Global navigational satellite system*
3. *Understand spatial processes and explore the spatial relationships between each component*
4. *Identify the potential of RS, GIS, and GPS in solving various spatial problems*
5. *Students will be able to apply these technologies in managing and monitoring natural and material resources.*

Unit - I

Remote Sensing: Electro Magnetic Radiation & Spectrum, Types of Remote Sensing based on types of platforms - Ground-Based, Airborne and Spaceborne; Based on types of sensors: Active and Passive; Satellite orbits, Resolution and its types: Spatial, Spectral, Radiometric and Temporal

Unit - II

GIS: Definition; Components and Elements of GIS, Representation of geographic data; Nature of geographic data: Spatial and Attribute Data, Concept of vector and raster-based models; Geodatabase, Spatial analysis,

Unit - III

GNSS: Fundamentals of GNSS, Basic principles of GNSS, Components of the global positioning system, Factors affecting GNSS accuracy, GNSS surveying methods, and accuracy, GNSS survey instruments.

UNIT - IV

Introduction to Geoinformatics- Concepts, Components, Latest Developments in Remote Sensing, GIS GNSS, and AI Hands-on Training to handle RS data in GIS software, GPS instruments.

UNIT - V

Applications of Geoinformatics in Various sectors, Applications in day-to-day activities, Group projects on applications of Geoinformatics in Agriculture, Forestry, Urban, Water, Health, and other natural resource management.

REFERENCES:

1. Burrough, P.A., and McDonnell, R.A., (1998): Principles of Geographic Information Systems, Oxford University Press, Oxford.
2. Environmental Systems Research Institute (ESRI) –GIS concepts
3. Jensen, J.R., (2004): Remote Sensing of the Environment: An Earth Resource Perspective, Pearson Education.
4. Joseph, G. (2004): Fundamentals of Remote Sensing, Universities Press, Hyderabad, India
5. Lillesand, T. M., Kiefer, R. W. and Chipman, J. W. (2008): Remote Sensing and Image Interpretation, John Wiley & Sons, New Delhi
6. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W., (2001): Geographic Information Systems and Science, Wiley, Chichester.
7. Spatial Technologies for Natural Hazard Management. Proceedings of ISRS National Symposium, Nov. 21-22, 2000, IIT, Kharagpur.
8. User Manual of DGPS, Total Station
9. Web resources, Published reports

Mapping of Program Outcomes with Course Outcomes:

	PO1	PO2	PO3	PO4	PO5
CO1		x	x	x	x
CO2	x	x	x	x	
CO3		x	x	x	x
CO4		x	x	x	x
CO5		x	x	x	x

Credits: 3 Course Code: GEO25OE02

FUNDAMENTALS OF GEOGRAPHY

Learning Outcomes:

By the end of this course, students will able to

1. *understand the basic concepts in geography and provide essential background for competitive exams and further geographical studies*
2. *explain what is happening to Earth systems in real time and analyze how variations in topography and climate affect human population and settlements*
3. *evaluate the characteristics of major geographical regions and comprehends the geography of India*

UNIT - I

Introduction to Geography: Themes of geography - Geographer's tools – Spatial approach - Geological time scale

UNIT - II

Physical Geography: Interior of the earth - Bodies of water and landforms - Dynamic earth: internal forces - external forces - Seasons and weather - Climate - World climate regions - Soils and vegetation

UNIT- III

Human Geography: Elements of Culture - Population Geography - Political Geography - Urban Geography - Economic Geography - Depletion of Resources

UNIT - IV

Regional Geography: Major Natural Regions: characteristics, economic base and human adaptation

UNIT - V

Geography of India: physical setting, drainage, climate, soils, natural vegetation, minerals and energy resources, agriculture, industries, and population distribution

REFERENCES:

1. Arreola, D.D., Deal, M.C., Petersen, J.F. and Sanders, R., (2007): World Geography, McDougal Littell.
2. Christopherson, R. W. and Birkeland, G. H., (2012): Geo-systems: An Introduction to Physical Geography (8th edition), Pearson Education, New Jersey.
3. Douglas, L. J. Haarmann, V., Johnson, M. L., and Clawson, D.L. (2010): World Regional Geography, 10th edition, Pearson Education Inc, New Jersey.
4. Goh Cheng Leong & Morgan, G.C. (1982): Human and Economic Geography, 2nd Edition, Oxford University Press, New Delhi.
5. Khullar, D.R. (2014): India: A Comprehensive Geography, Kalyani Publishers, New Delhi.
6. Knox, P. & Marston, S. (2013): Human Geography: Places and Regions in Global Context, 6th Edition, Pearson Education, New Delhi
7. Waugh, D. (2005): Geography: An Integrated Approach, Nelson Thornes, Cheltenham.

Mapping of Program Outcomes with Course Outcomes:

	PO1	PO2	PO3	PO4	PO5
CO1	x			x	x
CO2	x	x			
CO3			x	x	x

Credits: 3 Course Code: GEO25OE03

RURAL DEVELOPMENT

Learning Outcomes:

Upon completing this course, students will be able to:

1. *Understand the concept of rurality and rural economic structure.*
2. *Identify the need and significance of rural development in India*
3. *Acquaint with the efforts on rural development in India.*

Unit - I

Introduction to Rural Development: Defining rurality and rural development - Need for rural development, rural problems, rural demographic dynamics.

Unit - II

Rural Development strategies: Rural development strategies and approaches in India, pre-independence rural development schemes/programs in India, Gandhian concept of rural development.

Unit - III

Rural Economy: Agriculture and allied sectors, seasonality, historical progress and need for expanding non-farm activities, provision of infrastructure and services, access to elementary education, primary health care, marketing and micro credit, watershed management, rural tourism.

Unit - IV

Rural Governance: Rural governance and administration in India, experiences, 73rd constitutional amendment, Panchayat raj, people's political participation.

Unit - V

Rural Development Schemes and Programs: Post-Independence rural development strategies in India; CDP, green revolution, drought prone area development program, PMGSY, integrated rural development programme, MGNREGS etc., skill development programmes and schemes, recent developments in rural development.

REFERENCES:

1. Gilg, A. W., (1985): An Introduction to Rural Geography, Edwin Arnold, London.
2. Krishnamurthy, J. (2000): Rural Development - Problems and Prospects, Rawat Publications, Jaipur.
3. Lee, D. A. and Chaudhri D. P. (Eds.), (1983): Rural Development and State, Methuen, London.
4. Misra, R. P. and Sundaram, K. V. (Eds.), (1979): Rural Area Development: Perspectives and Approaches, Sterling, New Delhi.
5. Misra, R. P. (Ed.), (1985): Rural Development: Capitalist and Socialist Paths, Vol. 1, Concept, New Delhi.
6. Palione, M. (1984): Rural Geography, Harper and Row, London.
7. Ramachandran, H. and Guimaraes J. P. C. (1991): Integrated Rural Development in Asia – Leaning from Recent Experience, Concept Publishing, New Delhi.
8. Robb, P. (Ed.), (1983): Rural South Asia: Linkages, Change and Development, Curzon Press.
9. Yugandhar, B. N. and Mukherjee N. (Eds.) (1991): Studies in Village India: Issues in Rural Development, Concept Publications. Co., New Delhi.

Mapping of Program Outcomes with Course Outcomes:

	PO1	PO2	PO3	PO4	PO5
CO1	x				x
CO2	x	x	x		x
CO3	x		x	x	x

Credits: 3 Course Code: GEO25OE04

CONSERVATION OF NATURAL RESOURCES

Learning Outcomes:

Upon completing this course, the students will be able to:

1. *understand the concept of natural resources and how it can be influenced by physical, social, cultural, economic, and technical variables in different regions of the world*
2. *identify how human activities can cause irreversible damage to natural resources worldwide and relate how human impacts can influence the sustainability of the planet at different scales*
3. *evaluate how utilization of natural resources issues in one region can eventually become global issues by reviewing various patterns of development*
4. *assess and apply cost-effective prevention and conservation methods for the reduction of human footprints on natural resources that can be implemented around the world*

Unit - I

Introduction to Natural Resources - Approaches to Natural Resource Management- Economics of Resource Management - Environmental Policy and Ethics - Sustainable Development

Unit - II

Impact of Overpopulation - World Hunger - Air Quality and Pollution Control - Environmental Health and Health Hazards - Managing our Waste

Unit - III

Soil Conservation - Pest Management - Sustainable Agriculture - Water Resources Conservation - Water Pollution - Floods and Droughts

Unit – IV

Coastal Ecosystem Conservation - Marine Pollution - Fisheries Conservation – Biodiversity and Species Extinction - Forest Management

Unit – V

Mineral Resources Conservation –Non-renewable Energy - Renewable Energy Alternates - Mining Problems – Energy Efficiency - Urbanization and Sustainable Cities - Climate Change Adaptation

REFERENCES:

1. Jay H. Withgott, and Laposata M. (2014): Essential Environment: The Science Behind the Stories, Pearsons Ltd.
2. Daneil, D., Chiras, J., and Reganold, P. (2019): Natural Resource Conservation: Management for a Sustainable Future, Pearsons Ltd.
3. Susan L. Cutter, and William H. Renwick (2003): Exploitation, conservation, preservation: A Geographic Perspective on Natural-resource use, Wiley & Sons Inc.
4. Lynch, D. R. (2009): Sustainable Natural Resource Management: For Scientists and Engineers, Publisher: Cambridge University Press.
5. Martin J. O. (2018): Introduction to Sustainable Development, SAGE Publications India Pvt Ltd.
6. Smith, T. M., and Smith, R. L. (2012): Elements of Ecology (8th Edition), Pearson Education Inc.
7. Rogers, P., Jalal, K. F., and Boyd, J. A. (2007): An Introduction to Sustainable Development. Routledge Publishers.
8. Shivakoti, G., Pradhan, U., and Helmi, H. (2016): Redefining Diversity and Dynamics of Natural Resources Management in Asia (1st Edition), Sustainable Natural Resources Management in Dynamic Asia, Elsevier.

Mapping of Program Outcomes with Course Outcomes:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1	x				
CO2	x		x	x	
CO3				x	x
CO4		x		x	x