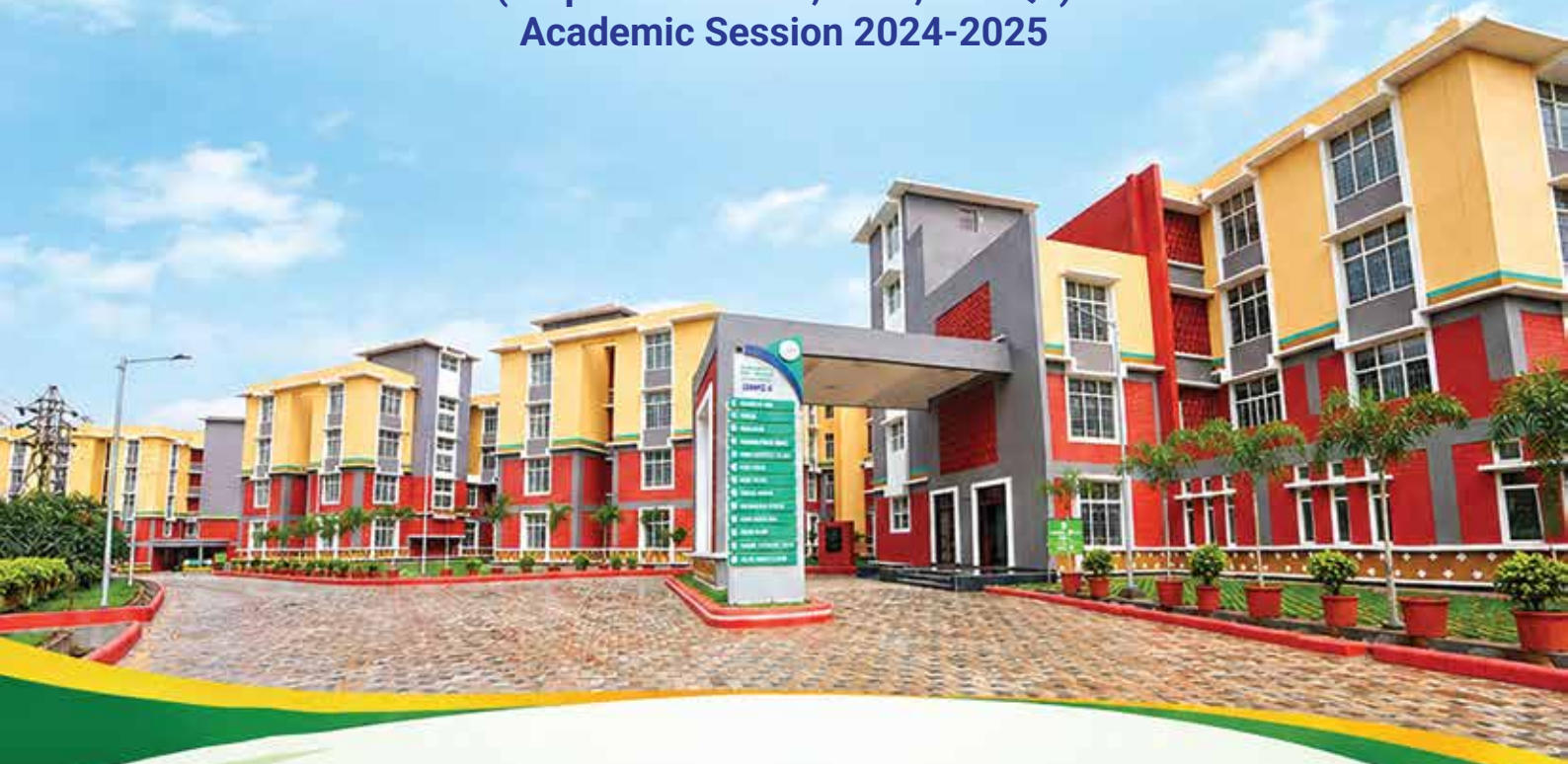
KISS

KALINGA INSTITUTE OF SOCIAL SCIENCES

CURRICULUM AND CREDIT FRAMEWORK FOR POSTGRADUATE PROGRAMME

MASTER OF ARTS/SCIENCE IN GEOGRAPHY

(As per NEP-2020, NCrF, NHEQF)
Academic Session 2024-2025



SCHOOL OF TRIBAL RESOURCE MANAGEMENT

KALINGA INSTITUTE OF SOCIAL SCIENCES (KISS)
DEEMED TO BE UNIVERSITY
Higher Education Campus, KISS Campus-3, Bhubaneswar, Odisha, 751024
https://university.kiss.ac.in | https://kiss.ac.in

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SCHOOL OF TRIBAL RESOURCE MANAGEMENT

The School of Tribal Resource Management, KISS Deemed to be University, was established in 2017-18, to address the current and emerging rural development needs of the country and the inadequacy of homogeneous models of development. The School of Tribal Resource Management actively endeavours to equip its academic programme to measure up to the local, regional, national and international standards. It may be mentioned here that KISS Deemed to be University is the first full-fledged institution in the field of tribal resource management in the country. Here students receive quality education free of cost. KISS is now determined to build on this advantage by creating a regular, organized and permanent framework to ensure that the knowledge and wisdom of yore is explored in depth scientifically for the lasting benefit of posterity. The establishment of a School of Tribal Resource Management is a step in this direction. The school has introduced three innovative interdisciplinary programmes namely Commerce, Economics and Geography, with specialization in Tribal Resource Management in the first phase with the approval of UGC to provide impetus to research in tribal resource management, tribal culture and tribal technology development. Besides implementing the Sustainable Development Goals of the United Nations, the School has succeeded in bringing about the tangible socio-economic changes in the tribal hinterland of Odisha and neighbouring states. Because of the School's commitment to helping tribal students develop their vocational, entrepreneurial and life skills, it strives to break the vicious circle of poverty and social isolation in which tribal communities find themselves trapped. The school also seeks to make tribal students aware that the people of their communities have a right to access varied indigenous resources and opportunities in order to live a self- sufficient, adequate and dignified life

DEPARTMENT OF GEOGRAPHY

The Department of Geography, under the School of Tribal Resource Management (STRM), KISS Deemed to be University, was established in the academic session 2021–2022 with the objective of fostering excellence in teaching, research, innovation, and community engagement in the field of Geography. The Department offers an M.A./M.Sc. in Geography with a specialization in Tribal Resource Management, providing a distinctive interdisciplinary curriculum that integrates physical and human geography with tribal ecosystems, indigenous knowledge systems, and sustainable resource management. The academic programme encompasses core domains of geography, including geomorphology, climatology, hydrology, biogeography, environmental geography, economic geography, population geography, agricultural geography, settlement geography, regional planning, and disaster management, complemented by advanced geospatial technologies such as Geographic Information Systems (GIS), Remote Sensing (RS), Global Navigation Satellite Systems (GNSS), spatial analysis and geoinformatics. The Department places

strong emphasis on experiential learning through fieldwork, laboratory training, research, and community outreach, enabling students to develop analytical, technical, and problem-solving skills. With a focus on climate change adaptation, disaster risk reduction, environmental sustainability, natural resource management, and tribal development, the Department is committed to addressing contemporary local, regional, national, and global challenges. Through quality education, innovative research, interdisciplinary collaboration, and extension activities, the Department strives to nurture competent geographers, researchers, planners, educators, and geospatial professionals equipped to contribute effectively to sustainable development and the achievement of the Sustainable Development Goals (SDGs).

Vision

Emerge as an internationally acclaimed School, recognized for excellence in teaching, research, consultancy and outreach, skill development and social entrepreneurship for tribal youth by promoting their cultural heritage and diversity

Mission

- Foster all-round development of students through multi-faceted education.
- Focus on sustainable tribal resource management with the help of innovative courses like natural resource management, sustainable tribal development, tribal entrepreneurship development, tribal marketing, tribal economy and livelihood.
- Engage with local, national and global communities to learn vital lessons about start-ups and become successful entrepreneurs in life.
- Manage resources effectively for creating employment opportunities including those for self-employment

Programme Overview

Programme Title

M.A/ M.Sc. in Geography

Programme Type

Postgraduate Programme

Programme Description

The M.A./M.Sc. in Geography with Specialization in Tribal Resource Management is a two-year postgraduate programme designed to provide advanced knowledge and practical skills through an interdisciplinary approach that integrates physical and human geography with geospatial technologies, including Geographic Information Systems (GIS), Remote Sensing (RS), Global Navigation Satellite Systems (GNSS), and Geoinformatics. The programme emphasizes tribal ecosystems, indigenous knowledge systems, environmental management, climate change, disaster risk reduction, sustainable resource management, and regional planning, equipping students with analytical, technical, and research competencies to address contemporary geographical and developmental challenges. Through a balanced combination of classroom teaching, fieldwork,

laboratory training, spatial data analysis, research, and community engagement, the programme promotes experiential and outcome-based learning while fostering innovation, critical thinking, and evidence-based decision-making. Aligned with the National Education Policy (NEP) 2020, the curriculum encourages multidisciplinary education, research, skill development, and ethical professional practices, while contributing to the achievement of the United Nations Sustainable Development Goals (SDGs). The programme prepares graduates for careers in academia, research, government organizations, planning and development agencies, environmental consultancy, geospatial industries, and non-governmental organizations, enabling them to contribute effectively to sustainable and inclusive development.

Process of Curriculum Development

All Schools shall follow the standard KISS-DU curriculum development protocol:

1. Formation of Syllabus Committee with domain experts.
2. Consultation with stakeholders (students, alumni, employers, community).
3. Review and approval by School faculty.
4. Vetting by Board of Studies (BoS) with external experts.
5. Final approval by Academic Council.
6. Integration of NEP-2020, CBCS, NCrF, and NHEQF guidelines.

Definitions of Components

a) Ability Enhancement Courses (AEC): It refers to the courses enhancing competency in a Modern Indian Language (MIL) and in the English language with special emphasis on language and communication skills not literature, prose, poetry and novel etc.

b) Academic Bank of Credits (ABC): The ABC has been envisaged by the UGC to facilitate the academic mobility of students with the freedom to study across the HEIs in the country with an appropriate 'credit TR40051transfer' mechanism from one programme to another, leading to attain a Degree/Diploma/Certificate, etc.

c) Academic Year: Two consecutive semesters constitute one academic year.

d) Choice Based: The students select courses from the prescribed courses i.e., Major, Minor, Multidisciplinary, Ability Enhancement Course (AEC), Skill Enhancement Course (SEC), Value Added Course (VAC), Summer Internship/ Lab/Research.

e) Major is the subject of main focus.

f) Credit Based Semester System (CBSS): Under the CBSS, the requirement for awarding a degree/diploma/Certificate is prescribed in terms of number of credits to be earned.

g) Credit: A unit by which the course work is measured. One credit is equivalent to one hour of lecture or tutorials or two hours of practical work/field work per week in a semester.

h) Minor Course helps a student to gain a broader understanding beyond the major discipline. The subjects mentioned in the minor (in the course structure table) will be offered only if a minimum of 10 students opt for that particular subject.

i) Multidisciplinary: It refers to the courses that a student can opt from other disciplines in order to broaden the intellectual experience.

j) Skills Enhancement Courses (SEC): It refers to the courses aiming at imparting practical skills, hands-on training, soft skills, etc., to enhance the employability of students.

k) Summer Internship/Apprenticeship/Summer Project: It refers to experiential exposure of a student. Summer Internship of 6-8 weeks duration after the completion of the fourth semester, followed by a project report and viva-voce examination during the fifth semester has been made compulsory to enable the students to have hands on experience of real-life business situations.

l) Research has been provided in the Eighth semester (for students securing 7.5 CGPA or above) involving application of knowledge in exploring/critical analysis/solving issues related to a real-life situation.

m) Value Added Courses: It refers to the courses enabling the students to acquire and demonstrate the knowledge and understanding of contemporary society.

NCrF-Aligned Components (National Credit Framework)

1. Operational Definition of Credit (NCrF Standard)

"1 Credit = 30 Notional Learning Hours."

A standard 4-credit course = 120 Notional Learning Hours.

NCrF-Compliant Course Engagement TableNCrF-Aligned Components (National Credit Framework)

1. Operational Definition of Credit (NCrF Standard)

"1 Credit = 30 Notional Learning Hours."

A standard 4-credit course = 120 Notional Learning Hours.

NCrF-Compliant Course Engagement Table

Component	Operational Definition	Hours (Example for 4-credit course)
Face-to-Face Lectures	Concept delivery, interactive instruction	45

Tutorials / Labs / Field	Hands-on practice, experimentation	30
Independent Self-Study	Pre-reading, journal review	20
Continuous Assessment	Assignments, quizzes, mid-term	12
Final Semester Exam Preparation	Revision, project completion	13
Total Notional Hours	Must equal 30 hours × credits	120

MOOC Courses (SWAYAM and SWAYAM Plus)

According to the UGC guidelines integrated into the new curriculum structures, Higher Education Institutions (HEIs) are permitted to allow students to take up to 40% of their total courses in a semester through the national MOOC platform, SWAYAM (or SWAYAM Plus for industry-aligned courses).

Credits earned via SWAYAM are mapped directly against the appropriate NHEQF academic level and digitally stored in the student's Academic Bank of Credits (ABC) to count toward their final degree, diploma, or certificate.

These exit awards correspond to progressive NHEQF / NSQF levels and are fully NCrF-compliant for credit accumulation, mobility and re-entry through the Academic Bank of Credits.

Skill Enhancement Courses (SEC), Multidisciplinary Courses (MDC), value-added courses and internships are creditised as per NCrF, recognising vocational, experiential and community-based learning alongside academic coursework. These courses are designed at appropriate NSQF levels, with clear competency descriptors and notional hours.

Eligibility for Admissions with No. of Seats

As per the admission guidelines and brochure of the KISS Deemed to be University.

Examination Pattern: As per NEP 2020

The medium of examination is English which will be reflected in their final grade sheet/certificate. Provided that for a language subject answers are to be in that language. Sanskrit may be written in Odia script but language has to be Sanskrit.

Duration of the Examinations-Mid Semester & End Semester:

Duration of examination for all term End examination shall be for 2.5 hours and for all Mid Term examination for 1 hour irrespective of full marks in the course/subjects and irrespective of credit. The practical examinations shall be of 2 hours duration.

Each School shall have a designated faculty as Examination Coordinator to be decided by the Vice Chancellor in addition to the Controller of Examinations of the University.

Continuous Evaluation and Mid Semester Examination:

a) Mid semester examination will be of 1-hour duration for 20/10 marks (20 for subjects having no practical and 10 for subject with practical papers). There shall be no pass mark in Mid Semester examination.

b) The Mid-Semester Examination shall be conducted and valued by the Faculty who are teaching the corresponding paper. A student who fails to appear in a Mid-Semester Examination **will be allowed one more chance to** take the same examination before appearing the concerned term-end examination. There will be no provision to re-appear in the Mid-Semester Examination for improvement.

c) For subjects with practical there will be a Mid-Semester practical examination carrying 10 marks.

d) The University authority of the valuation zones will preserve the answer Script of the End Semester examination for 06 months from the date of publication of result for reference.

e) A student has to appear the mid semester examination positively. Absence in the mid semester examination will be considered as fail however the candidate may be allowed to appear the mid semester examination before commencement of the concerned Term-End examination under special case duly considered by the HoD (for the ***candidates who represent the University or State for Inter- University or inter-state competitions in Games and Sports or attending different recognized National level camps/any critical medical case duly certified by the designated medical officer).***

Distribution of Marks in End Semester and Continuous Evaluation:
(Irrespective of credit in a course/Paper)

Course Type	Maximum Marks	Semester-End theory Mark	Continues Evaluation Marks /Sessional	Mid Semester theory Mark	Semester-End and Practical mark	Mid Semester Practical Mark
Without Practical	**100**	**60**	**20**	**20**	**----**	**--**

With Practical	**100**	**50**	**10**	**10**	**20**	**10**
Thesis/ Dissertation/ Seminar/Field Work	**100**	**------**	**-------**	**-------**	**-------**	**-------**

The **modes of evaluation** of **Thesis/ Dissertation/ Seminar/Field Work** shall be as follows:

1. Selection of Research Topic and Synopsis Presentation
2. Literature Review and Preparation of Research Tools (Questionnaires and schedule
3. Fieldwork and Data Collection
4. Data Analysis and Report Writing
5. Seminar Presentation and Viva voce test on dissertation

Distribution of Sessional Marks:(Continuous Evaluation)

Course Type	Maximum Mark	Mid Semester	Attendance	Surprise Test/Quiz/Viva	Assignment/ Presentation
Without Practical	**40**	**20**	**Above 95%- 5 Marks** **85%-94%- 4 Marks** **75%-84%- 3 Marks**	**10**	**05**
With Practical	**30**	(Theory 10 + Practical 10)=20		**05**	**Nil**

Examination Question Pattern of End Term Examination and Mark Distribution:

The evaluation process may cover summative and formative aspects and assess understanding applications, articulation, program and course outcome.

Question Pattern		With Practical	Without Practical
Part-I –Objective	**Answer in MCQ/ in one word/in one sentence as directed**	**1x5=5**	**1x6=6**

Part-II- Very Short Type	**Answer within 50 words. Answer any 3 out of 5 questions (with practical) and Answer any 5 out of 7 question (without practical)**	**2x3=6**	**2x5=10**
Part-III- Short Type	**Answer within 250 words Answer any 3 out of 5 questions (with practical) and Answer any 4 out of 6 question (without practical)**	**5x3=15**	**5x4=20**
Part-IV- Long Type	**Answer within 800 words. Answer any 3 out of 5 questions**	**8x3=24**	**8x3=24**
Total		**50**	**60**
For Practical Paper		**One Major Experiment-10 Record- 05 Viva voce-05**	---

Examination Question Pattern of Mid Semester Examination and Mark Distribution

Question Pattern		**With Practical**	**Without Practical**
Part-I –Objective	**Answer in MCQ/ in one word/in one sentence as directed**	**1x3=3**	**1x6=6**
Part-II- Very Short Type	**Answer within 50 words. Answer any 1out of 2 questions (with practical) and Answer any 2 out of 3 question (without practical)**	**2x1=2**	**2x2=4**
Part-III- Short Type	**Answer within 250 words Answer any 1 out of 2 questions (with practical) and Answer any 2 out of 3 question (without practical)**	**5x1=5**	**5x2=10**

Total		**10**	**20**
For Practical Paper		**One Major Experiment -5 Record-02 Viva voce-03**	---

Award of Degree:
A Degree certificate under the official seal of the university and signed by the Vice-Chancellor shall be presented at the Convocation or in absentia to each of the successful students of particular degree. The Controller of Examinations shall issue the mark/grade sheet of each semester to the candidates in the sheet of each semester to the candidates in the prescribed format.

Duration and Types of Courses and Process of Multiple Entry and Exit

NHEQF-Aligned Components (National Higher Education Qualifications Framework)

1. NHEQF Level Mapping for Multi-Entry / Multi-Exit

"This programme is structured according to the multi-entry, multi-exit parameters defined by UGC. The progressive qualification bands map directly onto the National Higher Education Qualifications Framework (NHEQF)."

Insert the following table:

Milestone / Year Completed	Exit Award	NHEQF Level	Standard Credit Range
Year 1 (Sem I–II)	UG Certificate	Level 4.5	~40 + 4 credits in work based vocational courses offered during summer term or internship / Apprenticeship in addition to 6 credits from skill-based courses earned during first and second semester.
Year 2 (Sem III–IV)	UG Diploma	Level 5.0	~80 + 4 credit in skill based vocational courses offered during first year or second year summer term
Year 3 (Sem V–VI)	UG Degree (3-Year)	Level 5.5	~120

Milestone / Year Completed	Exit Award	NHEQF Level	Standard Credit Range
Year 4 (Sem VII–VIII) **Year 1(Sem I-II)**	UG Honours / Honours with Research Post-Graduate Diploma	Level 6.0	~160
Year 2(Sem III-V)	Master's degree (e.g. M.A., M.Com., M.Sc., etc.)	Level 6.5	80 Credits
	Doctoral Degree	Level 8.0	Credits for coursework and, a thesis and published work

Programme Educational Objectives (PEO)

PEO1: The aim of this unique program is to enable the students to learn, evaluate and develop analytical ability relating to the diverse fields of geography with a focus on tribal resources. The programme should enable to develop a spatial approach in the sustainable development of tribal areas, their resources and tribal livelihood.

PEO2: To encourage interdisciplinary, multidisciplinary and trans-disciplinary study and research on various aspects of tribal welfare and management of natural resources including their indigenous knowledge.

PEO3: To holistically engage students through encompassing knowledge importation, research orientation, developing entrepreneurial skills with sound theoretical foundation. Enable students to provide innovative solutions to emerging problems.

PEO4: To provide a strong domain knowledge along with skill enhancement through hands-on training. To provide experiential training to students for professional and career readiness to participate in real life projects and develop the right skill-set needed in a competitive market scenario.

PEO5: To train students to work in the areas of research, provide consultancy, develop programme design, management and evaluation for socio-economic development of tribal population. Focus shall be for the cause of students' innovative learning with emphasis on continuous lifelong time honoured value based education.

NHEQF-Aligned Programme Educational Objectives (PEOs)

Programme Outcomes (PO)

PO1	Moral & Ethical Values	Demonstrate ethical values, distinguish right and wrong, practice honesty and responsibility, and participate responsibly in society and environmental conservation.
PO2	Disciplinary Knowledge	Explain and apply fundamental concepts of Physical, Human, and Environmental Geography along with principles of sustainable development.
PO3	Communication Skills	Communicate geographical ideas effectively through reading, writing, speaking, maps, diagrams, and digital media.
PO4	Critical Thinking, Problem solving & analytical reasoning	Analyze geographical concepts, examine issues critically, and evaluate problems from multiple perspectives.
PO5	Indian Knowledge Systems (IKS)	Recognize and integrate Indian traditional knowledge and tribal ecological practices in the study of geography to promote sustainable resource management, environmental stewardship, and community resilience.
PO6	Research-Related Skills	Collect, organize, interpret, and present geographical data systematically using basic research methods.
PO7	Cooperation/Teamwork	Ability to work effectively in groups, share ideas, and contribute collaboratively towards common goals.
PO8	Digital Literacy	Ability to use basic ICT tools, GIS, Remote Sensing, and data analysis techniques for academic and practical purposes.
PO9	Experiential & Life – long learning	Ability to apply classroom knowledge in real-life situations, engage in fieldwork, and develop self-learning skills for continuous growth.
PO10	Leadership Qualities	Demonstrate leadership, decision-making ability, responsibility, and positive attitude in academic and social activities.
PO11	Professional & Decision-making Skills	Ability to make informed decisions, apply knowledge in professional contexts, and develop skills for career advancement.
PO12	Environment Awareness and Sustainability	Analyze environmental issues, promote sustainable practices, and participate in conservation and resource management activities.

Programme Specific Outcomes (PSO)

PSO1: Students should be able to recall the facts and understand the basic concepts about geography, human and economic issues, environmental issues, urban environmental planning and management, environment and ecology, etc. This programme also apply and explain the concepts of various spatial-temporal issues concerning to the planet Earth and its interaction with the people.

PSO2: Interpret and analyze the information in emerging situations. Execute and solve issues in the real field and demonstrate in their career.

PSO3: Connect experiment, and evaluate those ideas acquired through learning in real life situations with focus on life cycle assessment approach.

PSO4: Students would be able to justify their stand, appraise, negotiate, defend, support others view both in their personal life and professional career

PSO5: Apply geospatial technologies, field survey techniques, and interdisciplinary knowledge to investigate geographical problems, support evidence-based decision-making, and promote sustainable development, particularly in tribal and rural communities.

Course Structure of the Post Graduate Programme
M.A/M.Sc. in Geography

Semester-I

Course Code	Course Title	Credits			Total Credits
		L	T	P	
SR40001	Social Research Methods	3	1	0	4
GO40003	Geography of Odisha	3	1	0	4
GO40005	Demography of Tribal Odisha	3	1	0	4
GO40007	Geoinformatics	2	0	2	4
GO40009	Artificial Intelligence in Geography	3	0	1	4
TR40051	Sustainable Tribal Development	3	1	0	4
	Total				**24**

Semester-II

Course Code	Course Title	Credits			Total Credits
		L	T	P	
GO40002	Application of Remote Sensing and GIS	3	1	0	4
GO40004	Sustainable Natural Resource Management	3	1	0	4
GO40006	Social and Cultural Geography	3	1	0	4
GO40008	Settlement Geography	3	1	0	4
GO40010	Rural Development Planning	3	1	0	4

TR40082	Academic Excursion Through Internship Programme	1	0	3	4
	Total				**24**

Semester-III

(Coursework and Research)

Course Code	Course Title	Credits			Total Credits
		L	**T**	**P**	
RM50001	Research Methodology	3	1	0	4
CA50005	Computer Application and Data Analysis	3	0	1	4
RE50003	Research and Publication Ethics	2	0	0	2
	(Choose any One)				
TR50051	Management of Tribal Resource	3	1	0	4
TR50053	Economics of Tribal Resource	3	1	0	4
TR50055	Resource Management and Tribal Development	3	1	0	4
	Specialization (Choose Any one Group)				
	Group: Urban and Regional Planning				
UR50031	Urban Settlement and Planning	3	1	0	4
UR50033	Urban Environmental Planning and Management	3	1	0	4
	Group: Geography of Tribes				
GT50031	Geography of Indian Tribes	3	1	0	4
GT50033	Tribal Development Policies and Programs in India	3	1	0	4
	Total				**22**

Semester-IV

Course Code	Course Title	Credits			Total Credit
		L	**T**	**P**	
FD50082	Fieldwork and Dissertation	0	0	20	20
	Total				**20**

SEMESTER-I

Course code	Title	Credit	L-T-P
SR40001	**SOCIAL RESEARCH METHODS**	**4**	**3-1-0**

Course Learning Objectives:

To infuse the idea of understanding the environment through social research employing the methodologies for driving into the findings accurately.

Course Outcomes: On successful completion of this course, the student shall be able to:

CO1: Understand the role and responsibilities of a Researcher.

CO2: Formulate the research problem and research design.

CO3: Design research plan and collect relevant data applying sampling techniques.

CO4: Develop data collection process, manage fieldwork and to report research findings.

CO5: Communicate the results to society at large and follow up and report the findings of the research with suggestions and apply the research ethics in the research process.

CO-PO- PSO Mapping

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO1 0**	**PO 11**	**PO1 2**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	
	3	2	1	1	–	2	1	2	1	–	2	1	2	–	–	1	
	2	3	2	2	1	2	2	2	1	1	2	1	2	1	–	2	
	2	2	3	2	2	3	2	2	2	1	2	1	2	2	–	2	
	2	2	2	3	1	2	2	2	1	2	3	3	3	2	1	2	
	1	2	2	3	3	2	2	2	3	2	3	2	2	1	2	1	

	2.0	**2.2**	**2.0**	**2.2**	**1.8**	**2.2**	**1.8**	**2.0**	**1.6**	**1.2**	**2.4**	**1.6**	**2.2**	**1.5**	**1.5**	**1.6**	

1- Weakly Mapped (Low)	3 - Strongly Mapped (High)
2- Moderately Mapped (Medium)	"__" No Correlation

Course Inputs:

UNIT I: Social Research: (12 Lectures)

Research Objective, Types of Research: Basic, Applied, Historical and Empirical, case study research. Steps in Social Research: Steps of research, Formulation of research problem, Literature review, Writing a research proposal, Synopsis writing.

UNIT II: Research Design: (12 Lectures)

Research design: Meaning, Definition and Features, Types of research design: Exploratory, Descriptive/Diagnostic, Experimental Sampling Design: Sampling: Concept, Types: Random, stratified, proportionate, quota, cluster or multistage, purposive and systematic sampling.

UNIT III: Methods of Data Collection: (12 Lectures)

Methods of primary data collection: Observation, Schedule, Questionnaire, Interview, Case study, Focused Group discussion (FGD), Participatory rural appraisal (PRA), Guidelines and methods for collection of secondary data.

UNIT IV: Statistical Analysis: (12 Lectures)

Frequency distribution and graphical presentation; Descriptive Statistics: Mean, Median, Mode, Standard Deviation; Co-relation and regression. Hypothesis: Research hypothesis, Testing of Hypothesis, t, F,Z, ANOVA and Chi-Square tests.

UNIT V: Report Writing: (12 Lectures)

Format/structure of research report, Techniques of report writing, Bibliography, Referencing. Research and Publication Ethics

Textbook Recommended:

1.Kothari, C. R.(2020) Research Methodology, Methods and Techniques -Wiley Eastern Limited - New Delhi.

Suggested Readings:

1. Ahuja, Ram (2018), Research Methods. Jaipur: Rawat Publication.
2. Dash, P.R. (2017). Research Methodology using SPSS, Vrinda Publications, New Delhi.

3. Gupta, C.B and Gupta, V.(2019) An Introduction to Statistical Methods, New Delhi: Vikas Publishing House PVT Ltd
4. Seale, C. (2018). Social Research Methods: A Reader. London, Routledge.
5. Swain A.K.P.C (2018), " A Text book of Research Methodology", Kalyani Publications
6. Wlliam G. Zicmund (2018), Business Research Methods, S. Chand and Company Ltd.

Reference website:

1. **Swayam link- https://onlinecourses.swayam2.ac.in/nou24_hs38/preview**

Note: Latest edition of the text books should be used.

SDG Mapping with this course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Skills for creating educational and community web resources
SDG 8	Decent Work and Economic Growth	Employable front-end / junior full-stack web development skills
SDG 9	Industry, Innovation and Infrastructure	Web apps as digital infrastructure for services and innovation
SDG 12	Responsible Consumption and Production	Efficient, responsible digital products

Course code	Title	Credit	L-T-P
GO40003	**GEOGRAPHY OF ODISHA**	**4**	**3-1-0**

Course Learning Objectives:

This course provides knowledge about the physical, human, and economic geography of Odisha. It helps students understand the state's resources, population, environment, climate, and regional development patterns.

Course Learning Outcomes: On successful completion of this course the students shall

enable to:

CO1: Describe the basic physical features of Odisha.

CO2: Explain climate, rainfall and major weather hazards of Odisha.

CO3: Understand population distribution and urban growth patterns.

CO4: Identify mineral resources, industries and development issues

CO5: Recognize environmental problems and sustainable development needs of Odisha.

CO-PO- PSO Mapping

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	–	2	–	–	1	–	1	–	1	3	2	–	–	–
CO2	3	3	1	2	2	–	1	2	–	1	–	1	3	3	–	–	–
CO3	3	3	2	2	2	–	2	2	1	1	–	1	3	3	2	–	–
CO4	3	3	2	3	3	1	3	2	2	1	–	2	3	3	2	2	1
CO5	3	3	3	3	2	2	3	3	2	2	1	2	3	3	2	2	2
Average	3	2.8	1.8	2	2.2	0.6	1.8	2	1	1.2	0.2	1.4	3	2.8	1.2	0.8	0.6
Mapping Scale:																	
1 – Low (Weakly Mapped)									3 – High (Strongly Mapped)								
2 – Medium (Moderately Mapped)									“–” No Correlation								

Course Inputs:

UNIT-I: Geological Structure, Physiography and Agriculture of Odisha

Geological Structure, Physiographic Divisions and Relief, (Northern Plateau (Similipal, Keonjhar, Bonai) Eastern Ghats and hilly regions (Koraput- Rayagada belt), Central Coastal Plains, River basins and deltaic plains.

Coastal features: beaches, spits, lagoons (Chilika Lake), Drainage System, soil, Natural Vegetation, Agriculture: (a) Production and Distribution of Rice, Pulses, Oil seeds; (b) Agricultural Problems and Prospects.

UNIT – II: Climate and Weather Events of Odisha

Weather Events: Tropical cyclones: causes, frequency, spatial distribution and impacts, Severe cyclones (1999 Super Cyclone, Fani, Amphan), Thunderstorms, lightning and associated hazards, Heatwaves: causes, affected regions and human health impacts

Climate of Odisha: Temperature regimes and humidity patterns, Coastal vs interior climatic contrasts, Distribution of Rainfall, Mechanism of Indian Monsoon – Special Reference to Odisha.

UNIT- III: **Population and Urbanization in Odisha**

Population distribution and Density: Spatial variation across districts, Physical, economic and cultural determinants, Population Growth: Trends since independence, Fertility, mortality and migration patterns, Urbanization: Growth of towns and cities, Urban hierarchy and functional classification, Urban problems: housing, slums, transport.

UNIT IV: **Resources, Industries and Development**

Major mineral resources of Odisha, Industrialization in Odisha – Problems and prospects, Location and Distribution of Iron and Steel Industry, Aluminum and Cotton Textile Industry, Industrial Regions Major industries of Odisha regional disparity and development

UNIT V: **Environment and Developmental Issues in Odisha**

Environmental Problems and Developmental Challenges, Floods, cyclones and coastal erosion, Deforestation and mining impacts, Development vs environment, Sustainable development and disaster management

Text Book Recommended:

1. Khullar, D. R. (2018), India A Comprehensive Geography (Paperback), Kalyani Publication.
2. Hussain, M. (2018), Geography of India (Paperback), McGraw Hill Education3. Sinha, B.N. (1999), Geography of Odisha, National Book Trust India
3. Geography of Odisha by G.C. Ray (2023 Edition, Kitab Mahal

References:

1. Deshpande C. D. (1992), India: A Regional Interpretation, ICSSR, New Delhi

2. Johnson, B. L. C., ed. (2001) Geographical Dictionary of India, Vision Books, New Delhi

3. Pathak, C. R. (2003), Spatial Structure and Processes of Development in India, Regional Science Assoc, Kolkata. 4. Tiwari, R.C. (2007), Geography of India. Prayag Pustak Bhawan, Allahabad

5. Sharma, T.C. (2013), Economic Geography of India. Rawat Publication, Jaipur

Reference website:

1. https://ugcmoocs.inflibnet.ac.in/assets/uploads/1/147/5127/et/34%20SCRIPT200304080803033939.pdf
2. https://odisha.gov.in/en/odisha-profile/topography

Note: Latest edition of the text books should be used.

SDG Mapping for this Course

SDG No.	**SDG Title**	**Nature of Contribution**
SDG 11	Sustainable Cities and Communities	Urbanization, regional planning and urban problems
SDG 13	Climate Action	Cyclones, heatwaves, climate variability and disaster management
SDG 15	Life on Land	Deforestation, mining impacts and environmental conservation
SDG 9	Industry, Innovation and Infrastructure	Industrial development and mineral resources
SDG 6	Clean Water and Sanitation	Drainage systems, floods and water resource management

Course code	**Title**	**Credit**	**L-T-P**
GO40005	**DEMOGRAPHY OF TRIBAL ODISHA**	**4**	**3-1-0**

Course Learning Objectives:

This course provides an understanding of tribal distribution, demographic characteristics, migration, and habitats with special reference to Odisha. It also highlights the geographical, socio-economic, and environmental factors influencing tribal communities and their development.

Course Learning Outcomes: On successful completion of this course the students shall enable to:
CO1: Remember the global distribution of tribe
CO2: Understand the geo politics of Odisha
CO3: Apply the knowledge of soil and vegetation in their micro level.
CO4: Analyse the Geographical location of their village especially tribal areas.
CO5: Evaluate the factors of effecting tribal economy.

CO-PO- PSO Mapping

CO/PO ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	–	–	1	2	1	–	–	–	1	3	2	–	–	–
CO2	3	3	1	2	1	1	2	1	1	–	–	1	3	2	–	1	–
CO3	3	3	2	2	2	2	2	2	1	1	–	1	3	3	2	1	1

CO4	3	3	2	3	2	2	3	2	2	1	1	2	3	3	2	2	1
CO5	3	3	3	3	2	3	3	3	2	2	1	2	3	3	2	2	2
Average	3	2.8	1.8	2	1.4	1.8	2.4	1.8	1.2	0.8	0.4	1.4	3	2.6	1.2	1.2	0.8
Mapping Scale:																	
1 Low (Weakly Mapped)										3 High (Strongly Mapped)							
2 Medium (Moderately Mapped)										"–" No Correlation							

Course Inputs:

UNIT-I: Introduction and Demographic Profile of Tribes in Odisha

Meaning and Definition of Indigenous People, Geographical Distribution of Tribes: Distribution of tribes across different districts of Odisha. Growth of tribal population; Demographic Profile of Odisha Tribes (Age and Sex, Rural and Urban, Literacy and occupational Structure)

UNIT- II: Introduction and Demographic Profile of Tribes in Odisha

Distribution of Most Vulnerable Primitive Tribal Groups in Odisha, Settlement patterns and isolation

UNIT-III: Factors Affecting Tribal Distribution and Welfare

Factors Affecting Distribution of Tribes: Groups and Sub-Groups, Tribes and Forests; Health, nutrition, and survival challenges, Government interventions and welfare measures for PVTGs in Odisha.

UNIT- IV: Tribal Migration and Socio-Cultural Change

Migration: Types of migration (seasonal, circular, permanent, distress-induced), Causes of migration, including poverty, land alienation, industrialization, mining, displacement, education, and employment opportunities, Acculturation and assimilation.

UNIT-V: Tribal Habitat, Biodiversity and Developmental Issues

Tribes and Their Habitat; Natural habitat of tribal; Developmental activity and its effect on traditional tribal habitats; Biodiversity and tribal habitat, environment.

Text books Recommended:

1. The Tribal Culture of India by L.P. Vidyarthi and Binay Kumar Rai, Concept Publishing Company Pvt. Ltd.2018

Suggested Readings:

1. Medical Geography of India Tribes by S.K. Tiwari, Sarup and Sons Publishers

2. Tribes of India- Realities and Representation by A. Ashok & P.V. Lakshmaiah, Telugu

Akademi, Hyderabad.

Reference website:

1. .https://pc.odisha.gov.in/sites/default/files/2020-03/eco-20CA.pdf
2. https://www.suniv.ac.in/docs/RDTS-1.pdf
3. https://stscarticle.odisha.gov.in/content/IQGAKZ5Q

Note: Latest edition of the text books should be used.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 1	No Poverty	Tribal livelihood, migration and welfare measures
SDG 3	Good Health and Well-Being	Health, nutrition and survival challenges of tribes
SDG 4	Quality Education	Tribal literacy and educational development
SDG 10	Reduced Inequalities	Tribal inclusion, welfare and social equity
SDG 13	Climate Action	Tribal habitat and environmental changes

Course code	Title	Credit	L-T-P
GO40007	**GEOINFORMATICS**	**4**	**2-0-2**

Course Learning Objectives:

In view of the wider application of cartographic tools and techniques in all geographical analysis, this special paper is introduced to provide requisite knowledge and skills in cartography. Students should be able to grasp Remote Sensing methodologies including sensors, platforms and data products from USA, ESA and India. They would also understand the integration of RS with GIS and GPS data. Pedagogy: Lectures, Practical, Power Point Presentation, Assignments, Case discussion, Projects and Seminars

Course Learning Outcomes: On successful completion of this course the students shall enable to:

CO1: Remember the significance of Cartography

CO2: Understand the principles of surveying and mapping.

CO3: Apply physical and socio-economic data through GIS, GPS for data representation and mapping.

CO4: Analyze GIS various data models.

CO5: Evaluate the spatial pattern of distribution through isopleth, choropleth, Choro chromatic mapping

CO–PO–PSO Mapping

CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3	PS O4	PSO 5

CO1	3	2	1	1	–	–	1	1	–	–	–	1	3	2	1	–	–
CO2	3	3	2	2	1	1	1	2	1	–	–	1	3	3	2	1	–
CO3	3	3	2	3	2	2	2	2	2	1	–	2	3	3	3	2	1
CO4	3	3	3	3	3	2	2	3	2	2	1	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	2.2	2.4	1.8	1.6	1.8	2.2	1.6	1	0.6	1.8	3	2.8	2.4	1.8	1.2
Mapping Scale:																	
1 – Low (Weakly Mapped)										3 – High (Strongly Mapped)							
2 – Medium (Moderately Mapped)										"–" No Correlation							

Course Inputs:

UNIT-I: **Fundamentals of Cartography and Surveying**

Significance of cartography; traditional and digital cartography. Principles of surveying; field survey techniques (triangulation, traversing and leveling) and mapping. Principles of mapping; base map preparation; concept of point, line and area; concept of generalization; scale factor and Types; choice of map projection (Zenithal, Conical, Cylindrical and Conventional);

UNIT-II: Mapping and Spatial Data Representation

Types of Maps; Techniques for the study of spatial patterns of distribution; Thematic mapping: meaning and type; principles of thematic mapping; basic ideas of pie diagrams, isopleth, choropleth and choro-chromatic mapping; concept of three-dimensional representation of geographical data. Techniques of physical and socio-economic data representation and mapping.

UNIT-III: GIS Concepts and Spatial Database Management

Introduction to GIS database theory; Overview of ARCGIS pro and ARCGIS interfaces. Mapping concepts; Spatial data models; Arc GIS data models, Map Digitization, Data Input and Georeferencing, map design and layout. Preparation of Base maps and thematic Maps using GIS Software •

UNIT-IV: **Digital Cartography, Remote Sensing and Spatial Analysis**

Digital cartography; Vector analysis; Raster analysis • Principles and applications of remote sensing, Digital image processing and classification; 3D analysis • Web GIS and open GIS; Network analysis; linear referencing, Geostatistical analysis; Project work

UNIT-V: GPS, Geodatabase and Data Management Techniques

Use of GPS and Data Collection; Geodatabase: Subtypes and domains, labels and annotation

Text Book Recommended:

1. Peterson G.N. (2021), GIS Cartography- A Guide to Effective Map Design, GretchenN. Peterson

2. Mathew W.W. (2017), New Lines Critical GIS and the Trouble of Map, MathewW. Wilson

3. P. (1992), Thematic Cartography and Remote Sensing, Concept publishing Co., NewDelhi

4. Nag, P. and Kudra, M. (1998), Digital Remote Sensing, Concept Publishing Co., NewDelhi

References:

1. Cuff, D.J. and Mattson, M.T. (1982), Thematic Maps: Their Design and Production, Methuen, New Work

2. Misra, R.P. and Ramesh, A. (1995), Fundamentals of Cartography, Concept Publishing Company, New Delhi

3. Patel, A.N. and Singh, S. (1999): Principles of Remote Sensing, Scientific Publishers (India), Jodhpur. Raisz, E.: General Cartography, McGraw Hill Co., London.

Reference website:

1. https://onlinecourses.swayam2.ac.in/e-learning/preview/cec26_ce02
2. https://onlinecourses.nptel.ac.in/e-learning/preview/noc22_ce26
3. https://onlinecourses.swayam2.ac.in/e-learning/preview/aic20_ge04
4. https://egyankosh.ac.in/handle/123456789/98174
5. https://egyankosh.ac.in/handle/123456789/98946 (Cartography)
6. https://egyankosh.co.in/books/mggl-001 (Cartography)
7. https://uou.ac.in/sites/default/files/slm/GE(N)-121.pdf
8. https://www.kngac.ac.in/elearning-portal/ec/admin/contents/2_18KP2G06_2021013002535940.pdf

Note: Latest edition of the text books should be used.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Development of technical and digital geospatial skills
SDG 9	Industry, Innovation and Infrastructure	GIS, GPS and digital mapping technologies
SDG 11	Sustainable Cities and Communities	Urban mapping, spatial planning and geospatial analysis

SDG 13	Climate Action	Remote sensing applications in climate and disaster studies
SDG 15	Life on Land	Resource mapping and environmental monitoring

Course code	Title	Credit	L-T-P
GO40009	**ARTIFICIAL INTELLIGENCE IN GEOGRAPHY**	**4**	**3-0-1**

Course Learning Objectives:

To introduce the fundamental concepts of geography and AI, highlighting the role AI can play in basic geographical studies.

Course Outcomes (COs)

CO1: Understand the basic concepts of Geography, Artificial Intelligence, and Machine Learning.

CO2: Apply AI and machine learning techniques in geographic data analysis and mapping.

CO3: Analyse remote sensing and environmental data using AI-based approaches.

CO4: Develop skills in GIS, spatial analysis, and AI applications for geographical problem solving.

CO5: Evaluate the role of AI in urban planning, agriculture, environmental monitoring, and disaster management**.**

CO-PO-PSO Mapping

Program Outcomes →	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO5**
Course Outcomes ↓																	
CO1	3	2	1	1	–	–	1	1	–	–	–	1	3	2	1	–	–
CO2	3	3	1	2	1	1	1	2	1	–	–	1	3	3	2	1	–
CO3	3	3	2	2	2	2	1	2	2	1	–	2	3	3	3	2	1
CO4	3	3	2	3	2	2	2	3	2	2	1	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	2	3	3	3	3	3	2

Average	3	2.8	1.8	2.2	1.6	1.6	1.4	2.2	1.6	1	0.6	1.8	3	2.8	2.4	1.6	1
Mapping Scale:																	
1 – Low (Weakly Mapped)										3 – High (Strongly Mapped)							
2 – Medium (Moderately Mapped)										"–" No Correlation							

Course Inputs:

Unit I: Introduction to Geography and Basics of Artificial Intelligence

Introduction to Geography: Overview of Physical and Human Geography, Core Geographical Themes: Location, Place, Human-Environment Interaction, Movement, and Regions, Basic Geographic Data: Maps, Spatial Data, and Geographic Information Systems (GIS),Basics of Artificial Intelligence (AI):AI and its history and Key Definitions, Branches of AI: Machine Learning (ML), Deep Learning (DL), Natural Language Processing (NLP), AI Works: Algorithms, Data, and Models, AI and Geography: An Overview: Applications of AI in Geographic Studies, Simple Use Cases: AI for Mapping, Geographic Data Analysis.

Unit II: Machine Learning Basics and Geographic Data

Introduction to Machine Learning (ML): Meaning and Definition of Machine Learning, Types of ML: Supervised, Unsupervised, and Reinforcement Learning, Common Algorithms: Linear Regression, K-Means Clustering, Geographic Data and Machine Learning: Understanding Geographic Data: Spatial vs. Non-Spatial Data, Data Collection Methods: Surveys, GPS, Remote Sensing, Preparing Geographic Data for AI Models: Data Cleaning, Feature Selection
AI in Map-Making and Spatial Analysis: Basic Map Creation with AI Tools, Spatial Patterns and Trends Analysis using ML

Unit III: Remote Sensing, Environmental Data, and AI Applications:

Introduction to Remote Sensing: Meaning and Definition of Remote Sensing, Types of Remote Sensing: Satellite Imagery, Aerial Photography, Basics of Image Processing and Interpretation, AI in Remote Sensing: Simple AI Applications in Image Classification, Land Cover and Land Use Mapping with AI, Environmental Monitoring: Deforestation, Water Body Detection

Unit IV: Geographic Environmental Data:

Environmental Data Types: Introduction; Climate, Soil, Water and Vegetation Data
AI in Environmental Data Analysis: Collection, Analysis and Interpretation of Environmental Data using AI Techniques

Unit V: Geographic Information Systems (GIS) and AI for Problem Solving

Introduction to GIS: Meaning and Definition of GIS: Components and Applications, Mapping and Spatial Analysis Using GIS, AI and GIS: How AI Enhances GIS Capabilities, AI Applications in Urban and Rural Geography: Urban Planning: AI for Traffic Prediction, Population Distribution, Resource Allocation, Rural and Agricultural Applications: Crop Monitoring, Soil Analysis.AI in Disaster Management: Predicting Natural Disasters (Floods, Earthquakes, Forest Fires), AI for Crisis Mapping and Response.

Reference Books / Text Books

1. Artificial Intelligence in Geography – Stan Openshaw & Christine Openshaw.
2. Handbook of Geospatial Artificial Intelligence – CRC Press, 2023.
3. GeoAI with Python: A Practical Guide to Open-Source Geospatial AI - Practical applications of GeoAI and spatial analysis.
4. Advances in Machine Learning and Image Analysis for GeoAI – Elsevier, 2024.
5. Geospatial Intelligence: Applications and Future Trends – Applications of AI in geospatial sciences.
6. GIS Fundamentals: A First Text on Geographic Information Systems – Fundamentals of GIS and spatial analysis.
7. Remote Sensing of the Environment: An Earth Resource Perspective – Remote sensing concepts and applications.
8. Principles of Geographical Information Systems for Land Resource Assessment – GIS principles and applications.

Reference website:

1. National Council of Educational Research and Training (NCERT)
2. e-PG Pathshala
3. SWAYAM Online Courses
4. NPTEL Courses
5. ISRO Bhuvan Learning Resources

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	AI-based learning and digital skill development
SDG 9	Industry, Innovation and Infrastructure	AI, GIS and geospatial technologies
SDG 11	Sustainable Cities and Communities	Urban planning, traffic prediction and spatial analysis
SDG 13	Climate Action	Environmental monitoring and disaster prediction
SDG 15	Life on Land	Land use mapping, deforestation and environmental management

Course code	Title	Credit	L-T-P
TR40051	SUSTAINABLE TRIBAL DEVELOPMENT	4	3-1-0

Course Learning Objectives:

The paper will offer have the course objectives viz. Concepts, approaches and opportunities of sustainable development, Knowledge about the human and natural / non-natural resources and their sustainable use, have a conceptual and theoretical understanding on sustainable development, MDGs and SDGs, bio-diversity and climate change. Also focus on socially inclusive and environmentally sustainable, Knowledge about policies and programmes of international and national efforts pertaining to rural development.

Course Learning Outcomes: After completion of the course, learners will be able to:

CO1: Understand key initiatives required to enhance the contribution of an organisation towards Sustainable Development;

CO2: Analyse the significance of various steps taken by UNDP to ensure Sustainable Development;

CO3: Assess the results of Smart Cities Mission Initiative of Government of India;

CO4: Evaluate key achievements of National Programmes/Initiatives aligned with SDGs.

CO5: Judge Tribal participants sustainable growth maintaining the ecological balance for a healthy living and understand the initiatives taken by the government and the United Nations' Sustainable Development Goals for the cause of sustainable tribal development.

CO-PO-PSO Mapping

Program Outcomes →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	
Course Outcomes ↓																	
CO1	3	2	2	2	1	3	1	2	3	2	2	2	3	1	1	2	
CO2	3	3	2	2	2	3	2	2	3	2	2	2	3	2	1	2	
CO3	2	3	2	3	2	3	2	2	3	2	3	2	3	2	1	2	
CO4	2	2	2	3	2	3	2	2	3	3	3	2	3	2	2	2	

CO5	2	3	2	3	3	3	2	2	3	3	3	3	3	3	2	2	
Average	**2.4**	**2.6**	**2.0**	**2.6**	**2.0**	**3.0**	**1.8**	**2.0**	**3.0**	**2.4**	**2.6**	**2.2**	**3.0**	**2.0**	**1.4**	**2.0**	
Mapping Scale:																	
1 – Low (Weakly Mapped)									3 – High (Strongly Mapped)								
2 – Medium (Moderately Mapped)									"–" No Correlation								

Course Inputs:

UNIT I: Understanding Sustainable Development (12 Lectures)

Meaning and evolution of the concept. Sustainability of culture, identity and development; History of the sustainable development – Brundtland, Rio and Sustainable Development Goals (SDGs); Economic growth and progress; Continuing poverty; Environmental threats hitting the rich and poor alike; the business-as-usual path versus the sustainable development path, Future of sustainable development.

UNIT II: The Millennium Development Goals (MDGs) and the End of Extreme Poverty (12 Lectures)

A strategy to end extreme poverty in underdeveloped countries; The continuing challenge of the food supply in India; A closer look at official development assistance; Designing practical interventions: The case of millennium villages.

UNIT III: Basic Needs and Sustainable Development (12 Lectures)

Sustainable food supply and the end of hunger; Universal health coverage; Small holder livelihood and the role of agroforestry- Food and nutritional security Fulfilment of food, fodder, fuel wood and shelter-based needs- income generation vs. subsistence production. Right to education for all.

UNIT IV: Sustainable Development and Biodiversity conservation (12 Lectures)

The need for Sustainable Development and Biodiversity conservation for a new emerging India. Hurdles in SD. Consumption and importance of Sustainable Development and Environment. Milestones towards a sustainable world.

UNIT V: SDGs and Funding for Sustainable Development (12 Lectures)

Understanding SDGs; Goal-based development; Financing (including the politics of financing) for sustainable development; Principles of good governance; is sustainable development feasible. Tribal Policy and Economy: Initiatives by the Central and the State governments- State and Scheduled Tribes; Tribal Development Administration and Management; Tribal Development: Methods and Techniques; Project Management; Tribal Quest for Rights and Entitlements; Tribal development initiatives by the Central and the State governments.

Text Book Recommended:

1. Kumar, A. (2004), Tribal development and planning, Institute for Sustainable Development
2. Mosse, D. 2005. Cultivating development: An anthropology of aid policy and practice, London: Pluto Press.

References:
1. Diamond, J., (1999), Guns, Germs, and Steel: The Fates of Human Societies. W.W. Norton
2. Mosse, D. and D. Lewis (eds) (2005), The aid effect: Giving and governing in international development. London, Pluto Press
3. Sachs, Jeffrey D. (2005), The Age of Sustainable Development, NY, Columbia University Press

Reference website:

1. e-PG Pathshala – Geography and sustainable development e-content for higher education.
2. SWAYAM Online Courses – MOOCs and study materials related to sustainability and environment.
3. eGyanKosh (IGNOU Study Material) – Free downloadable notes on sustainable development and environment.

Note: Latest edition of the text books should be used.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 1	No Poverty	Poverty reduction and sustainable livelihood
SDG 3	Good Health and Well-Being	Universal health coverage and nutrition
SDG 5	Gender Equality	Empowerment of tribal women
SDG 10	Reduced Inequalities	Inclusion of marginalized tribal communities
SDG 13	Climate Action	Climate change and sustainable development
SDG 15	Life on Land	Biodiversity conservation and environmental sustainability

Semester-II

Course code	Title	Credit	L-T-P
GO40002	**APPLICATION OF REMOTE SENSING AND GIS**	**4**	**3-1-0**

Course Learning Objectives: This course introduces students to the fundamentals of Remote Sensing (RS), Geographic Information Systems (GIS), and Global Positioning Systems (GPS). It enables them to acquire, analyze, visualize, and interpret geospatial data for informed decision-making and sustainable resource management. The course also develops practical geospatial skills, enhances analytical and problem-solving abilities, and prepares students for careers in the geospatial industry.

Course Learning Outcomes: On successful completion of this course the students shall enable to:

CO1: Remember the basics of Remote sensing, GIS and GPS.

CO2: Understand the Geospatial technology and basics of mapping and cartography

CO3: Apply the techniques of Remote Sensing and GPS in day-to-day life.

CO4: Analyze the fundamentals of GIs, its component and applications.

CO5: Evaluate the difference between GIS and GPS functions

CO–PO–PSO Mapping

Program Outcomes →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
Course Outcomes ↓																	
CO1	3	2	1	1	–	–	1	1	–	–	–	1	3	2	1	–	–
CO2	3	3	2	2	1	1	1	2	1	–	–	1	3	3	2	1	–
CO3	3	3	2	2	2	2	2	2	2	1	–	2	3	3	3	2	1
CO4	3	3	3	3	2	2	2	3	2	2	1	2	3	3	3	3	2
CO5	3	3	3	3	3	3	2	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	2.2	2.2	1.6	1.6	1.6	2.2	1.6	1	0.6	1.8	3	2.8	2.4	1.8	1.2

Mapping Scale:			
1 – Low (Weakly Mapped)			3 – High (Strongly Mapped)
2 – Medium (Moderately Mapped)			"–" No Correlation

Course Inputs

UNIT-I: Fundamentals of Remote Sensing and Geospatial Technology

Development of Geospatial Technology and its utility, Remote Sensing Technology; Fundamentals of Remote Sensing; Physics of Electro Magnetic Energy; Remote Sensing Platforms, Sensors and Data Products; Thermal Remote sensing, Microwave remote sensing; Indian Remote Sensing Satellites and sensors.

UNIT-II: Remote Sensing Data Processing and Image Interpretation

Remote sensing Data Products of India and abroad, Visual Image Interpretation methods and techniques, Digital image Interpretation, Digital image collection and storage, radiometric and geometric correction, Use of projections, image registration and Georeferencing, Colour

Composite, image enhancement, filtering, transformation, image classification: supervised and unsupervised, Digital change detection,

UNIT-III: Geographic Information System (GIS) and Spatial Analysis

Cartographic Techniques of Mapping: Thematic map designing and Layout using GIS, Geographical Information System: Fundamentals of GIS; Components of GIS; GIS Data Types, Types of Data structure in GIS, Spatial Analysis, network analysis, overlay analysis, NDVI and NDWI, Web GIS

UNIT-IV: **Global Positioning System (GPS): Principles and Applications**

Global Positioning System (GPS): Overview of GPS; Functions of GPS; Segments of GPS; Accuracy of GPS; Applications of GPS.

UNIT-V: Applications of Remote Sensing and GIS in Natural Resource Management and Disaster Management

Application of Remote sensing and GIS in Land use and Landcover Analysis, Mapping of Water Resources, Mapping of Forest Resources, Application of geospatial technology in Disaster Management.

Text Book Recommended:

1. Chang, K. T. (2006), Introduction to Geographic Information Systems, Tata McGraw Hill 2. DeMers, M. (2009), Fundamentals of Geographic Information Systems, 4th Edition, JohnWiley andSons

3. Campbell J. B. (2007), Introduction to Remote Sensing, Guildford Press

References:

1. Pandey, J. and Pathak D. (2013), Geographic Information System, TERI Publishing House 2. Chor, Pang Lo, (2009), Concepts and Techniques of Geographic Information System, Prentice Hall
2. Demers, Michael N., (2012), Fundamentals of Geographic Information Systems, Willy
3. Shekar, S. and Xiong, H. (eds.) (2008), Encyclopedia of GIS, Springer
4. Jensen, J. R. (2004), Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall
5. Joseph, G. (2005), Fundamentals of Remote Sensing, United Press India
6. Lillesand, T. M., Kiefer, R. W. and Chipman, J. W. (2004), Remote Sensing and Image Interpretation Wiley (Wiley Student Edition).
7. Joseph, George & Jeganathan, C.(2022); Fundamentals of Remote Sensing, Universities Press.
8. Chouhan, Dr. T.S.(2022), Geoinformatics Fundamentals and Applications,(2022), Jaipur, Scientific Pub.
9. Srivastava, G.S., An Introduction to Geoinformatics(2022), New Delhi, TMH
10. Shekhar, Shashi & Xinng, Hui, Encyclopedia of GIS (2022), New York, Springer

11. Nag, Dr. Prithvish & Kudrat, Dr. M., Digital Remote Sensing(2022), New Delhi, Concept pub.
12. Nag, Dr. Prithvish, The Matic Cartography and Remote Sensing(2022), New Delhi, Concept pub.
13. Tripathi, Dr. Archana, Geospatial Technology and its Applications in Resource Management(2024), New Delhi, Disha International Pub.

Reference website:

1. Esri – ArcGIS Official Website – GIS software, spatial analysis and geospatial applications.
2. QGIS Official Website – Open-source GIS software for mapping and spatial analysis.
3. USGS Earth Explorer – Satellite imagery and remote sensing data portal.
4. NASA Earthdata – Earth observation and environmental datasets.
5. ISRO Bhuvan Portal – Indian geospatial and remote sensing data platform.
6. Google Earth Engine – Cloud-based geospatial analysis platform.
7. OpenStreetMap – Open-source spatial and map database.
8. National Remote Sensing Centre (NRSC) – Remote sensing applications and spatial data services in India.

Note: Latest edition of the text books should be used.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Development of technical and geospatial knowledge through GIS and Remote Sensing
SDG 6	Clean Water and Sanitation	Mapping and monitoring of water resources using geospatial technology
SDG 9	Industry, Innovation and Infrastructure	Application of GIS and Remote Sensing in technological innovation and infrastructure planning
SDG 11	Sustainable Cities and Communities	Urban planning, land use analysis and disaster management applications
SDG 13	Climate Action	Environmental monitoring, climate studies and disaster risk reduction
SDG 15	Life on Land	Forest resource mapping, biodiversity conservation and land cover analysis
SDG 17	Partnerships for the Goals	Integration of geospatial technologies for collaborative research and sustainable development planning

Course code	Title	Credit	L-T-P
GO40004	**Sustainable Natural Resource Management**	**4**	**3-1-0**

Course Learning Objectives:

To inculcate the ideas of natural resource management through sustainable approach for the management of biodiversity including land, water, air in a participatory manner. Also, to facilitate the concepts, ideas and knowledge on the preservation, conservation and protection of environment for controlling pollution and climate change through public participation for sustainable development. Students will be exposed to Environmental protection Act, Environmental Ethics and Environmental Valuation. They will also learn different International and national efforts taken for the conservation and preservation of natural resource management.

Course Learning Outcomes: On successful completion of this course the students shall

enable to:

CO1: Understand overview of Natural Resources; Biodiversity, and Climate change.

CO2: Apply the techniques of management on water sources, soil resources, plant resources, animal resources, human resources and aquatic resources and their management and related frameworks.

CO3: Analyse Environmental Pollution and their control methods along with important concept of CPRs (Common Property Resources)

CO4: Enforce various Environmental Protection laws to safeguards that safeguards natural resources in various meaningful ways.

CO5: Adopt Environmental Ethics including executing the 2030 Agenda for Sustainable Development Goals of United Nations and estimate Environment Valuation

CO–PO–PSO Mapping

Program Outcomes →	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
Course Outcomes ↓																	
CO1	3	2	1	1	–	2	1	1	–	–	–	1	3	2	1	1	2

CO2	3	3	1	2	1	2	2	2	1	–	–	1	3	3	2	2	2
CO3	3	3	2	2	2	2	2	2	2	1	–	2	3	3	2	2	2
CO4	3	3	2	3	2	3	2	3	2	2	1	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	1.8	2.2	1.6	2.4	2	2.2	1.6	1	0.6	1.8	3	2.8	2.2	2.2	2.2
Mapping Scale:																	
1 – Low (Weakly Mapped)									3 – High (Strongly Mapped)								
2 – Medium (Moderately Mapped)									"–" No Correlation								

Course Inputs:

UNIT-I: Introduction to Natural Resources and their management:

Overview on Natural Resources – Triple Bottom Line (TBL) and concept of Sustainable Natural Resource Management. Biodiversity and its conservation – understanding concept, importance, value of biodiversity. Hotspots biodiversity, threats to biodiversity and conservation of biodiversity, Forest and wild life- importance, a status, factors responsible for their loss, their conservation and management, Climate change, global warming and agro-ecological

UNIT-II: Natural Resource Management (NRM): Water resources and their management – Traditional sources of Water conservation, rainwater Harvesting, Watershed Management Resettlement and Rehabilitation of people (Project, consequences and Case Study) Transition to more participatory management - JFM, CFM, FRA 2006, CSR (Corporate Social Responsibility) as a tool for sustainable NRM based business. Case studies about corporate social responsibility, NRM based CSR action, E-governance, Climate change and corporate responses.

UNIT-III: Environmental Pollution and their control method

(Both Traditional and Modern method) Air pollution, water pollution, soil pollution, (causes, effect and control measures of Air pollution, water pollution and soil pollution). Common Property Resources (CPRs) – emergence of the concept of common property resources, Coase's property rights and bargaining solution, institutional arrangements for managing CPRs, tragedy of the commons. Disaster and its Management

UNIT-IV: Environmental Protection Act: The Air (Prevention and control of pollution, both Traditional and Modern Method) Act; The Water (Prevention and control of pollution) Act; The Forest Conservation Act; Environmental Protection Act

UNIT-V: Environmental Ethics: Issues and possible solution. Equitable use of resources for sustainable life style, public awareness, Good Health and Welbeing, Clean Water and Sanitation, Affordable and Clean Energy, Life Below Water and Land.

Text Book Recommended:

1. Paul, Ellen Frankel**,** Natural resources The Environmrnt and Human Welfare (2024), Cambridge University.
2. Kolstad, Charles D. (2018) "Environmental Economics", Oxford University Press.
3. Anderson, David A, (2014), Environmental Economics and Natural Resource Management, Routledge
4. Lynch, Daniel R. (2009), Sustainable Natural Resource Management for Scientists and Engineers by Daniel R. Lynch, Cambridge University Press

References:

1. Bhattacharya P., Kandya A.K. and Kumar Krishna (2008), Joint Forest Management in India, Aavishkar Publisher, Jaipur.
2. Heal, Geoffrey, (2017), Nature and the Marketplace: Capturing the Value of Ecosystem Services, Island Press.
3. Kareiva, Peter, et al. (2016), Natural Capital: Theory and Practice of Mapping Ecosystem Services, Oxford.
4. Saha, (2013), "Ecology and Environmental Biology", Kalyani Publisher.
5. Reganiold, C. (2009) Natural Resource Conservation Chiras Reganiold, Pearson, 10th Edition.

Reference website:

1. https://onlinecourses.nptel.ac.in/e-learning/preview/noc22_ag10
2. https://egyankosh.ac.in/handle/123456789/39208
3. http://egyankosh.ac.in//handle/123456789/86743

Note: Latest edition of the text books should be used.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-Being	Pollution control, environmental health and disaster management
SDG 6	Clean Water and Sanitation	Water resource management, rainwater harvesting and watershed management
SDG 7	Affordable and Clean Energy	Sustainable energy use and environmental conservation practices
SDG 11	Sustainable Cities and Communities	Sustainable development, environmental protection and disaster resilience
SDG 12	Responsible Consumption and Production	Equitable use of natural resources and sustainable lifestyle practices
SDG 13	Climate Action	Climate change mitigation, global warming awareness and ecological conservation
SDG 15	Life on Land	Biodiversity conservation, forest management and wildlife protection

SDG 16	Peace, Justice and Strong Institutions	Environmental laws, governance and participatory management approaches
SDG 17	Partnerships for the Goals	Community participation, CSR initiatives and collaborative environmental management

Course code	Title	Credit	L-T-P
GO40006	**SOCIAL AND CULTURAL GEOGRAPHY**	**4**	**3-1-0**

Course Learning Objectives:

This course aims to introduce students to the fundamental concepts, theories, and perspectives of Social and Cultural Geography. It enables learners to understand the spatial dimensions of social structures, cultural practices, and societal processes. The course emphasizes diversity in society and culture with special reference to tribal communities of India and Odisha. It also sensitizes students to contemporary social issues, regional disparities, and cultural expressions, thereby fostering critical thinking, inclusivity, and contextual understanding of society and culture.

Course Learning Outcomes: On successful completion of this course the students shall enable to:
CO1: Students will be able to remember the concepts and elements of social and cultural geography.
CO2: Students will be able to understand social issues such as Sanskritization, Westernization, globalization, and national integration.
CO3: Students will be able to apply knowledge related to different cultural areas, regions, and cultural expressions.
CO4: Students will be able to analyze the relationship between environment and culture.
CO5: Students will be able to evaluate the tribal society and culture of India and Odisha.

CO–PO–PSO Mapping

Program Outcomes →	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4	PSO5

Course Outcomes ↓																	
CO1	3	2	1	1	–	1	1	1	–	–	–	1	3	2	1	1	1
CO2	3	3	1	2	1	2	2	2	1	–	–	1	3	3	1	2	1
CO3	3	3	2	2	2	2	2	2	2	1	–	2	3	3	2	3	2
CO4	3	3	2	3	2	3	2	3	2	2	1	2	3	3	2	3	2
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	1.8	2.2	1.6	2.2	2	2.2	1.6	1	0.6	1.8	3	2.8	1.8	2.4	1.8
Mapping Scale:																	
1 – Low (Weakly Mapped)									3 – High (Strongly Mapped)								
2 – Medium (Moderately Mapped)									"–" No Correlation								

UNIT I: Introduction to Social Geography

Evolution, nature, scope and significance of Social Geography; social structure and social processes including mobility, inequality, exclusion and inclusion; social geography in the realm of social sciences.

UNIT II: Elements of Social Geography

Ethnicity; tribe; dialect and language; caste and religion; concept of social well-being.

UNIT III: Contemporary Social Issues

Sanskritization: concept, process and spatial implications; modernization: social transformation, urbanization and development; globalization: cultural homogenization, localization and identity; national integration: cultural diversity, unity and regional disparities.

UNIT IV: Introduction to Cultural Geography

Nature, scope and evolution of Cultural Geography; environment and culture and elements of culture; concept of cultural areas and cultural regions; cultural landscapes and dwelling patterns as cultural expressions.

UNIT V: Tribal Society and Culture of India

Social formation of tribes; spatial distribution of tribal communities in India; theories of tribal groups, indigenous knowledge systems and cultural sustainability; categories of tribal art forms and dance forms in India.

UNIT VI: Tribal Society and Culture of Odisha

Major tribes and PVTGs of Odisha; distribution of tribal population in Odisha; religious rites and festivals of the tribes of Odisha; major tribal art forms of Odisha; major tribal dances of Odisha.

Recommended Books:

1. Ambrose, P.(1969) Analytical Human Geography, Longmans Green & Co.Ltd , London
2. Cater, John and Trevor Jones (1989) Social Geography: An Introduction to Contemporary Issues, Edward Arnold Publishing House, London
3. Chattopadhyaya, Deviprasad (1959) Lokayata: A Study in Ancient Indian Mate
4. Realism, Peoples Publishing House, New Delhi
5. Desai, A.R.(1969) Rural Sociology in India, Popular Prakashan, Bombay
6. Raza Moonis(ed;1979) A Survey of Research in Geography, Indian Council of Social Science Research, New Delhi
7. Sukhwal, B.L.(1985) Modern Political Geography in India, Sterling Publishers Pvt.Ltd, New Delhi
8. Thapar, Romila(1990)From Lineage to State, Oxford University Press, Delhi

Text Books:

1. Ahmed, Aijazuddin(1999) Social Geography, Rawat Publications, New Delhi
2. Ghurye,G.S.(1950) Caste and Class in India, Popular Book Depot, Bombay
3. Ghurye,G.S.(1969) Caste and Race in India, Popular Book Depot, Bombay
4. Mandelbaum, D.G.(1970) Society in India, Popular Prakashan, Bombay
5. Singh, K.S.(1985) Tribal Society in India: An Anthro-Historical Perspective, Manohar Publications, New Delhi
6. Thapar, Romila(1977) A History of India, Vol.1, Penguin Books Ltd, Hammondsworth

Reference website:

1. https://www.youtube.com/watch?v=b8vleSh52zI
2. https://onlinecourses.swayam2.ac.in/e-learning/preview/cec26_hs79
3. https://www.wbnsou.ac.in/online_services/SLM/PG/PGGR-03-Gr-B.pdf
4. https://egyankosh.ac.in/handle/123456789/109916

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Understanding social and cultural diversity through inclusive education
SDG 5	Gender Equality	Awareness of gender roles and inclusiveness in society and culture
SDG 10	Reduced Inequalities	Study of social inequality, exclusion, tribal welfare, and regional disparities
SDG 11	Sustainable Cities and Communities	Preservation of cultural heritage, cultural landscapes, and tribal traditions
SDG 13	Climate Action	Indigenous knowledge and cultural adaptation to environmental change

SDG 16	Peace, Justice and Strong Institutions	Promotion of social harmony, national integration, and cultural coexistence
SDG 17	Partnerships for the Goals	Community participation and collaborative approaches for cultural sustainability

Course code	Title	Credit	L-T-P
GO40008	**SETTLEMENT GEOGRAPHY**	**4**	**3-1-0**

Course Learning Objectives:

This course introduces students to the concepts, patterns, morphology, and functions of settlements. It helps learners understand the factors influencing settlement location, growth, and development, along with the relationship between settlements and the natural environment. The course also highlights the challenges and opportunities of contemporary rural and urban settlements through theoretical concepts and case studies.

Course Learning Outcomes: On successful completion of this course the students shall enable to:

CO1: Understand the concept of human settlements and their spatial organization

CO2: Analyse the processes of urbanization and rural settlement development.

CO3: Evaluate the environmental and social impacts of settlements on surrounding areas.

CO4: Apply theoretical frameworks and research methods in settlement geography to analyse real-world scenarios

CO5: Reflect on the role of settlements in shaping human societies, economies, and environments.

CO–PO–PSO Mapping

Program Outcomes →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
Course Outcomes ↓																	
CO1	3	2	1	1	–	1	1	1	–	–	–	1	3	2	1	1	1
CO2	3	3	2	2	1	2	1	2	1	–	–	1	3	3	2	2	1
CO3	3	3	2	2	2	3	2	2	2	1	–	2	3	3	2	2	2

CO4	3	3	3	3	2	2	2	3	2	2	1	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	2.2	2.2	1.6	2.2	1.8	2.2	1.6	1	0.6	1.8	3	2.8	2.2	2.2	1.8
Mapping Scale:																	
1 – Low (Weakly Mapped)									3 – High (Strongly Mapped)								
2 – Medium (Moderately Mapped)									"–" No Correlation								

Course Inputs:

UNIT–I: Fundamentals of Settlement Geography

Nature, scope and contents of Settlement Geography; site, situation and evolution of settlements. importance of settlement geography in planning and development. approaches and methods in settlement studies.

UNIT–II: Spatial Patterns and Morphology

Types of settlements: rural, urban and peri-urban; morphological characteristics: compact, dispersed and fragmented settlements; settlement patterns and their analysis.

UNIT–III: Urban Settlements and Urbanization

Types and stages of urban settlements; Census definition of urban settlements, urban agglomeration, urban sprawl, rural-urban continuum, rurban and peri-urban areas.

UNIT–IV: Rural Settlement and Their Forms

Definition, nature and characteristics of rural settlements; types of rural settlements: linear, rectangular, circular, star-shaped and T-shaped settlements.

UNIT–V: Settlement System, Models and Theories

Models and theories: rank-size rule, primate city and central place theory; urban morphology: concentric zone theory, sector theory and multiple nuclei theory; case study of a settlement with observations on structure, form, house types, building materials, functions, population characteristics, transport and market.

Text Book Recommended:

1. Ghosh, S. 1998. Introduction to Settlement Geography, Sangam Books Ltd.
2. Tiwari R.C. Settlement Geography; Om Book Store

References:

1. Banerjee Guha, S. (Ed.) 2004. Space, Society and Geography, Rawat Publication.
2. Bjelland, M.D., Montello, D.R., Fellmann, J.D., A., Getis, J.2000
3. Carter, H. 1995. The Study of Urban Geography, 4th ed, Arnold.
4. Dhanagare, D.N. 2004. Themes and Perspectives in Indian Sociology, Rawat Publication.
5. Hudson, F.S. 1970. Geography of Settlements, Macdonald and Evans Ltd.
6. Hussain, M. 2007. Models in Geography, Rawat Publication.
7. J. I. Clarke (1973) : Population Geography, Pergamon Press, Oxford.

Reference website:

1. https://egyankosh.ac.in/handle/123456789/100008

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution

SDG 4	Quality Education	Development of geographical and analytical understanding of settlements
SDG 9	Industry, Innovation and Infrastructure	Study of settlement systems, transport, and infrastructure development
SDG 11	Sustainable Cities and Communities	Urban planning, sustainable settlements, and regional development
SDG 13	Climate Action	Understanding environmental impacts of settlements and urban growth
SDG 15	Life on Land	Human-environment interaction and sustainable land use planning
SDG 16	Peace, Justice and Strong Institutions	Balanced regional development and inclusive planning
SDG 17	Partnerships for the Goals	Community participation and collaborative approaches in settlement planning

Course code	**Title**	**Credit**	**L-T-P**
GO40010	**RURAL DEVELOPMENT PLANNING**	**4**	**3-1-0**

Course Learning Objectives:

The course would enable the students to understand the process of planning in our country at the national and the state level. They will understand multi-level planning, which is important for the development of any planning system. They will get to know about the significance and procedure of grassroots level planning in rural development. The course would also allow them to understand the concept of block planning. Students can get a clear picture of the concept and process of district planning in India.

Course Learning Outcomes: On successful completion of this course the students shall

enable to:

CO1: Remember the basic elements of rural development.

CO2: Understand the process of planning to our country at the national and state level.

CO3: Apply rural development policies in their rural area.

CO4: Analyse block and district level planning and strategies for sustainable development.

CO5: Evaluate the different developmental schemes and programs of central and state government for their people and areas.

CO–PO–PSO Mapping

Program Outcomes →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
Course Outcomes ↓																	
CO1	3	2	1	1	–	1	1	1	–	–	–	1	3	2	1	1	1
CO2	3	3	2	2	1	2	2	2	1	–	–	1	3	3	2	3	2
CO3	3	3	2	2	2	2	2	2	2	1	–	2	3	3	2	2	2
CO4	3	3	3	3	2	3	3	3	2	2	1	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	2.2	2.2	1.6	2.2	2.2	2.2	1.6	1	0.6	1.8	3	2.8	2.2	2.4	2
Mapping Scale:																	
1 – Low (Weakly Mapped)									3 – High (Strongly Mapped)								
2 – Medium (Moderately Mapped)									"–" No Correlation								

Course Inputs

UNIT-I: Concept and Planning of Rural Development: Concept of Rural Development, Basic Elements of Rural Development, Rationale of Rural Development, Growth versus Development, Approaches to the Study of Rural Development, Rural Development Planning at the national level and state level, Decentralized and Multi-level Planning: Structure and process. District Planning Process.

UNIT-II Micro Level and Tribal Development Planning: Micro Level Planning (Village Level Planning): Introduction, Meaning and Scope of Micro / Grassroots Level Planning, The Panchayati Raj System, Two-tier System: Tribal Development Planning, Tribal Sub Plans: TDA and ITDA, Developmental schemes and programs of Central and State Govt. for tribal people and tribal areas

UNIT-III: Rural Poverty: Concept. Causes, Nature, Biases, Cluster of Disadvantages and Deprivation Traps Rural Poverty Alleviation Measures, Rural Poverty Scenario in India, Criteria of BPL and APL in India, Poverty Alleviation and Rural Welfare schemes in India.

UNIT-IV: Rural Development Policies and People's Participation: Rural Development Policies; Tribal Development Policies and approaches, Special Provisions for tribal people and tribal areas, Constitutional provisions and guidelines for tribal areas and people. Rapid Rural Appraisal and Participatory Rural Appraisal, 73rd Constitutional Amendment Act. and its impact on Rural Development. Peoples Participation and Role of Voluntary Organizations in Rural Development.

UNIT–V: Rural Development Programmes and Sustainable Development

Major Rural Development Programmes in India: MGNREGA, PMGSY, NRLM, SGSY, IRDP, PMAY-G and Digital India initiatives in rural areas, Sustainable Rural Development: Concept, principles and indicators of sustainability in rural areas.

Text Book Recommended:

1. Jha, S.N. and Mathur, P.C. (1999), Decentralization and Local Politics, Sage

Publications, New Delhi

2. Mathew George (1994), Panchayati Raj: From Legislation to Movement, Concept Publishers, New Delhi Alagh, Y.K. (1973), "District Planning for Integral Development" Journal of the Lal Bahadur Academy of Administration, Mussoorie.

3. Reddy, Venugopal (1979), Multi-Level Planning in India, Vikas, New Delhi.

4. Jain, S.P. (1997), "The Gram Sabha: Gateway to Grassroots Democracy", Journal for Rural Development, Vol.16, No.4, October-December.

References:

1. George, M. (2000), Status of Panchayati Raj in the States in India, Concept Publishing House, New Delhi

2. Desai, Vasant (1988), Rural Development, Organisation and Management, Volume III, Himalaya Publishing House, Bombay

3. Desai, Vasant (1988), Rural Development – Programmes and Strategies, Volume II, Himalaya Publishing House, Bombay

4. Government of India (1978), Report of the Working Group on Block Level Planning, Planning Commission, New Delhi

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 1	No Poverty	Rural poverty alleviation programmes and welfare schemes
SDG 2	Zero Hunger	Rural livelihood, food security, and agricultural development

SDG 4	Quality Education	Rural awareness, skill development, and participatory learning
SDG 5	Gender Equality	Inclusive participation in rural governance and development
SDG 8	Decent Work and Economic Growth	Employment generation through MGNREGA and rural development schemes
SDG 10	Reduced Inequalities	Tribal development planning and inclusive rural policies
SDG 11	Sustainable Cities and Communities	Sustainable rural settlement and regional planning
SDG 13	Climate Action	Sustainable resource management and environmental awareness
SDG 16	Peace, Justice and Strong Institutions	Panchayati Raj, governance, and constitutional provisions
SDG 17	Partnerships for the Goals	Community participation, voluntary organizations, and collaborative rural development

Code	Course Title	Credit	L-T-P
TR40082	**ACADEMIC EXCURSION THROUGH INTERNSHIP PROGRAMME**	4	3-1-0

CO1-The students will have working knowledge in the real world and operate.

CO2- Develop an understanding of the importance and scope of industry interface.

CO3- Understand the changing micro and macro environment of organizations and the importance of industry research and forecasting.

CO4- Develop an understanding of the competitive strategies for industry.

CO5- Establish a link between academic programme and industry as a strategic tool for staying ahead in a competitive market.

CO-PO- PSO Mapping

**Course Outcomes **	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**

Program Outcomes																
CO1	3	2	2	2	1	2	3	2	1	2	2	2	3	1	3	2
CO2	3	3	2	3	2	2	3	2	1	3	2	2	3	2	3	2
CO3	2	2	3	2	1	3	3	2	1	2	3	2	3	1	3	2
CO4	2	3	2	3	2	2	3	2	2	2	3	2	3	2	3	2
CO5	2	2	3	3	2	3	3	2	2	3	3	2	3	2	3	2
Average	**2.4**	**2.4**	**2.4**	**2.6**	**1.6**	**2.4**	**3.0**	**2.0**	**1.4**	**2.4**	**2.6**	**2.0**	**3.0**	**1.6**	**3.0**	**2.0**

1 – Weakly Mapped (Low)
2 – Moderately Mapped (Medium)
3 – Strongly Mapped (High)
– – No Correlation

Course Description:

This course is designed to develop and improve your understanding of tribal culture of India (Odisha) through the documentaries on resource management, practices on Indigenous Knowledge (IK) system and material culture. This will also help to expand your knowledge on tribal perspectives and responsibilities on the resource managers and IK practitioners.

Course Outcomes-

To produce skilled and knowledgeable students who not only develop thorough understanding of society and tribal economy, but also helps in exploring the theoretical and practical knowledge on tribal resource management.

The student will be able to recognise the role and significance of tribal prospective of resource management, traditional knowledge practice and its utilization.Students will be able to explain the relationship between tribal culture with resource management and knowledge system through the documentary movies provided by the SCSTRTI, Bhubaneswar Odisha. Students will be able to distinguish between materials/tangible culture and non-tangible culture of Tribes of Odisha which includes agricultural equipment, hunting equipment, art and craft, jewellery, textile and so on. The students will be aware and more pro towards the importance and usefulness of Intellectual property right.

SDG Mapping with this course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Experiential learning and field-based knowledge
SDG 10	Reduced Inequalities	Understanding and inclusion of tribal communities
SDG 11	Sustainable Cities and Communities	Preservation of cultural heritage
SDG 12	Responsible Consumption and Production	Sustainable resource management practices
SDG 15	Life on Land	Conservation of natural resources and biodiversity

Semester-III

Course code	Title	Credit	L-T-P
RM50001	**RESEARCH METHODOLOGY**	**4**	**3-1-0**

Course learning Objectives:

The objectives of this course is to provide exposure to various research techniques and methods (both quantitative and qualitative). Build upon the basic assumptions in adopting different methodologies for different kinds of research themes. Adopt appropriate methodologies for building upon hypotheses and analysing research gaps. Teach certain quantitative methods, statistical techniques and qualitative methods to collect and analyse the data would help them organize and analyse the information gathered by them.

Course Outcomes:

On the completion of this course students should be able to:

CO1- Know the formulation of research problems and plan for their structural study.

CO2- Understand the scope of collection of relevant data and their interpretations

CO3- Learn the use of various statistical analysis for decision making.

CO4- Learn different quantitative methods, statistical techniques and qualitative methods to collect and analyse the data.

CO5- Adopt methodologies to build hypotheses and test them with appropriate methods.

CO-PO- PSO Mapping

Course Outcomes \ Program Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	
CO1	3	2	1	1	1	2	1	2	1	–	2	1	2	1	–	2	

CO2	2	3	2	2	2	2	2	2	1	1	2	1	2	2	1	2	
CO3	2	3	2	3	3	2	2	3	2	1	3	1	3	3	1	3	
CO4	2	2	3	3	2	2	2	2	1	2	3	2	3	2	2	2	
CO5	2	3	2	3	3	2	2	2	2	2	3	2	3	3	2	2	
Average	2.2	2.6	2.0	2.4	2.2	2.0	1.8	2.2	1.4	1.2	2.6	1.4	2.6	2.2	1.2	2.2	
1 – Weakly Mapped (Low) 2 – Moderately Mapped (Medium)								3 – Strongly Mapped (High) "__" No Correlation									

Course Inputs:

Unit-I Introduction to Research (12 Lectures)

Meaning of Research, Philosophy of Research, Motivation of Research, Importance and Scope of Research, Scientific Research Methods and its Application to Social Phenomenon Introduction to various aspects of research methods, Types of Research.

UNIT-II Research Design and Data Collection (12 Lectures)

Research Design: Meaning, Need and features of a good design. Types of Research Design. Literature Review and its Importance, Steps in the Process of Research, Research Proposal, Qualitative research for publication/communication Sources and Methods of Data Collection

UNIT-III Research Problem and Types (12 Lectures)

Research Problem, Research objectives and its Formulation, Fundamental research questions, Research Variables, Measurement and Scaling: Measurement in Research, Measurement Scales, Source of Error in Measurement, Test of sound Measurement: Reliability and Validity. Qualitative Research, Ethnographic Study, Observation, Case Study Method, Interviewing, Schedule, Mail Survey Method, Action Research: PRA and RRA, Focused Group discussion (FGD)

UNIT-IV Statistics (12 Lectures)

Descriptive Statistics: Frequency Distribution, Relative, Percentage and Cumulative Frequency Distribution, Graph and Diagrams: Two Variables Graphs, Bar Diagrams, Pie Diagram, Pictorial Diagrams. Measures of Central Tendency: Mean, Mode, Median, Measures of Variability: Range, Standard Deviation, Coefficient of Variation, Normal Distribution: Basic Concept only, Standard Scores Correlation: Correlation Coefficient and its properties, Linear Regression: Regression coefficients, Line of Regressions, Relation between Regression Coefficients and Correlation Coefficient., Rank Correlation Coefficient, Biserial Correlation Coefficient, Coefficient of Determination

UNIT-V Sampling (12 Lectures)

Sampling: Need for Sampling, Methods of Probability Sampling and Non probability Sampling. Sampling and Non sampling Error

Hypotheses: Concept of Population, Sample, Parameter and Statistic, Concept of Hypothesis, Types of Hypotheses, Formulation of Hypothesis, Procedure of Testing of Hypothesis, Test of

Significance, One- tailed and Two-tailed Test, Testing of Single Mean and Difference of Means, Parametric and Non parametric Test, Variable Analysis.

Report Writing: Objective, Purpose of Report, Type of Reports, Report Writing Process, Guidelines for Effective Report Writing.

Suggested Readings:

1. Creswell, John W (2009) Research design: qualitative, quantitative, and mixed methods approaches

2. Creswell, John W (2013) Qualitative inquiry and research design: choosing among five approaches

3. Garett, Henry, E Statistics in Psychology and Education - David Heley and Co.

4. Huberman, A. Michael (2002) Qualitative researcher's companion

5. Maxwell, Joseph (2005) Qualitative research design: an interactive approach

6. W.J. Goode and P. K. Hatt (1952) Methods in Social Research. Mc Graw Hill Co.

Reference Books:

1. Kothari, C.R. Research Methodology, Methods and Techniques -Wiley Eastern Limited - New Delhi

2. Ahuja, R (2010), Research Methods, Rawat Publication, Jaipur.

3. Sondhi N, Chawla D.(2nd Edition), Research Methodology, Vikas Publication.

Swayam Link- https://onlinecourses.swayam2.ac.in/nou24_cm17/preview

SDG Mapping with this course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Development of research and analytical skills
SDG 9	Industry, Innovation and Infrastructure	Research for innovation and problem-solving
SDG 12	Responsible Consumption and Production	Research for sustainable practices
SDG 16	Peace, Justice and Strong Institutions	Ethical research and evidence-based policy-making

Course code	Title	L-T-P	Credit

CA50005	COMPUTER APPLICATION AND DATA ANALYSIS	3-0-1	4

Course Objectives:

The objectives of this course is to increase knowledge and requisite skills of participants on the use of SPSS and to enable the scholars make the most of this powerful software package while allowing them to work independently with SPSS on their own data and provide a solid foundation for advanced data analysis work. Increase proficiency of scholars on the use of Basic computer Applications and SPSS.

Course Outcomes:

On the completion of this course students should be able to:

CO1- Have idea about basic computer hardware and software.

CO2- Command on MS-office package for organized compiling and presentation of a research thesis.

CO3- Conversance with the use of SPSS for data analysis and decision making

CO4- Learn how to formulate and test different hypotheses.

CO5- Learn using different analytical and research related software packages.

CO-PO- PSO Mapping

Course Outcomes \ Program Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	
CO1	3	2	1	2	1	1	1	3	1	1	2	1	2	1	1	3	
CO2	3	3	2	3	2	1	2	3	1	2	2	1	3	2	1	3	
CO3	2	3	2	3	3	2	2	3	2	2	3	2	3	3	1	3	
CO4	2	2	2	3	2	2	2	3	2	3	3	2	3	2	2	3	
CO5	2	3	2	3	3	2	2	3	2	3	3	2	3	3	2	3	
Average	2.4	2.6	1.8	2.8	2.2	1.6	1.8	3.0	1.6	2.2	2.6	1.6	2.8	2.2	1.4	3.0	
1 – Weakly Mapped (Low) 2 – Moderately Mapped (Medium)										3 – Strongly Mapped (High) – – No Correlation							

Course Inputs:

UNIT-I Computer Basics and Computer Fundamentals [8 Classroom Contact Hours]

Hardware and Software. Functional units comprising a typical computer configuration: input/output, fixed and removable data storage, internal storage, control and arithmetic/logic unit. The concepts relating to execution speed, data access times, storage capacities and similar comparative aspects of hardware performance.

Operating Systems, Windows, Linux etc. Application software, role and functions of commonly available applications

Computer Network Concept- Data communication and network terminology, IP address and its significance, Internet, Multimedia, WWW, FTP, E-mail, and Web pages. Concept of VPNs. Concept of Network security and management.

UNIT-II Microsoft Word [8 Classroom Contact Hours]

Creating and editing documents, formatting text and paragraph, formatting documents, creating and formatting tables, illustration documents with graphics. Creating a web page, mail merge and document merging, working with styles and templates, developing multi-page documents, integrating word with other applications, exploring advance graphics, building forms. working with charts and diagrams

UNIT-III Microsoft Excel [8 Classroom Contact Hours]

Building and editing worksheets, formatting a worksheet, working with charts, working with formulas and functions, managing workbooks and preparing them for the web, automating worksheet tasks with macros, using lists, analysing list data, enhancing charts and worksheets Using analysis tools, analysing data with pivot tables, exchanging data with other programs.

UNIT-IV Microsoft PowerPoint [8 Classroom Contact Hours]

Creating a presentation with Microsoft PowerPoint, modifying a presentation, inserting objects into presentation, finishing a presentation, working with advanced tools and masters, enhancing charts, inserting illustration, objects and media clips, using advanced features.

UNIT-V Statistical Analysis [8 Classroom Contact Hours]

The analysis will be done with the help of SPSS, and other statistical packages. The syllabus includes the following topics: Descriptive Analysis: Mean, Median, Mode, Standard Deviation, Correlation. Regression Analysis, t- test, chi-square test, R-Square test, Factor Analysis,

ANOVA, NVIVO, SPSS., JAMOVI, AMOS.

Total Practical / Lab Experiments: [30 Lab Contact Hours]

1. Create and format a table in Word with at least 5 rows × 5 columns; apply borders, shading, and sorting.
2. Perform a Mail Merge: prepare a personalized invitation letter using an Excel data source (name, address).
3. Build a student mark sheet with fields (Name, Roll, Subject Marks). Apply formulas for Total, Average, Percentage, and Grade.
4. Format the worksheet (merge cells, adjust column width, borders, number formatting). Apply conditional formatting (highlight marks <40 in red).
5. Create different charts (bar, pie, line) for student performance or sales data. Enhance charts with titles, legends, and labels.
6. Demonstrate formulas and functions:
   SUM, AVERAGE, MAX, MIN, COUNT, IF
7. Create a PowerPoint presentation (minimum 8 slides) on "Emerging Technologies in Computing." Include title slide, content slides, conclusion, and references.
8. Create a PowerPoint presentation (minimum 10 slides) on "Emerging Trends in Computer Science." Include:
   1. Slide designs, transitions, and animations
   2. Insert images, charts, and SmartArt
   3. Add audio or video clips
9. Input a dataset of student scores into SPSS. Perform Descriptive Statistics: Mean, Median, Mode, Standard Deviation, and Correlation. Generate graphs (histogram, scatter plot).
10. Using SPSS, perform Hypothesis Testing:
    - t-test for comparing two groups
    - Chi-square test for categorical data
    - ANOVA for comparing more than two groups
    - Report R-square and regression results with interpretations

Suggested Readings:

1. Hari Shankar Asthana, Braj Bhushan, Statistics for Social Sciences (With SPSS Applications, PHI Publication.

2. Jesus Salcedo, Keith Mccormick, SPSS Statistics for Dummies, 3rd Edition (Paperback), Wiley Publication.

3. Sabine Landau and Brian S. Everitt, A Hand Book of Statistical Analysis Using SPSS

Reference Books:

1. Goel, Computer Fundamentals, Pearson Education, 2010.

2. K. Kalyanaraman, Hareesh N. Ramanathan, P.N. Harikumar, Statistical Methods for Research: A Step-by-Step Approach Using IBM SPSS, Atlantic Publication

3. R. Panneerselvam, Research Methodology, 2nd Edition, PHI Publication.

Swayam Link- https://onlinecourses.swayam2.ac.in/nou24_cm16/preview

https://onlinecourses.nptel.ac.in/noc24_mg70/preview

SDG Mapping with this course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Enhancing digital literacy and analytical skills
SDG 8	Decent Work and Economic Growth	Improving employability through IT and data skills
SDG 9	Industry, Innovation and Infrastructure	Use of technology and software tools for innovation
SDG 12	Responsible Consumption and Production	Promoting digital and paperless work environments

Course code	Title	Credit	L-T-P
RE50003	**RESEARCH AND PUBLICATION ETHICS**	**2**	**2-0-0**

Course Objectives:

The objectives of this course is to:

This course is focusing on basics of philosophy of science and ethics, research integrity, publication ethics, Hands on sessions are designed to identify research misconduct and predatory publications. Indexing and citation databases, open access publications, research metrics

(citation, hi-index, impact factor etc.) and plagiarism tools will be taught in this course.

Course Outcomes:

On the completion of this course students should be able to:

CO1- Learn about basics of philosophy of science and ethics, research integrity.

CO2- Have awareness about the publication ethics and publication misconducts.

CO3- Learn about the publication related databases and various research related tools.

CO4- Develop knowledge about indexation and citation of publications.

CO5- Learn in and out of research publications.

CO-PO- PSO Mapping

Course Outcomes \ Program Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	
CO1	3	2	2	1	2	3	1	2	1	–	2	2	2	2	1	2	
CO2	2	3	2	2	2	3	1	2	1	1	2	2	2	2	1	2	
CO3	2	3	2	3	3	3	2	2	1	1	3	2	3	3	1	2	
CO4	2	2	3	2	2	2	2	3	1	1	3	2	3	2	2	3	
CO5	2	2	3	3	3	3	2	2	2	2	3	2	3	3	2	2	
Average	2.2	2.4	2.4	2.2	2.4	2.8	1.6	2.2	1.2	1.0	2.6	2.0	2.6	2.4	1.4	2.2	

1 – Weakly Mapped (Low)	**3** – Strongly Mapped (High)
2 – Moderately Mapped (Medium)	**–** – No Correlation

Course Inputs:

UNIT-I: Philosophy and Ethics **(5 Lectures)**

Introduction of philosophy: Definition, nature and scope, concept, branches Ethics: Definition, moral philosophy, nature of moral judgments and reactions.

UNIT-II: Scientific Conduct **(5 Lectures)**

Ethics with respect to science and research, Intellectual honesty and research Integrity Scientific Misconducts: Falsification, Fabrication and Plagiarism (FFP) Redundant Publications: duplicate

and overlapping publications, salami slicing Selective Reporting and misrepresentation of data

UNIT-III: Publication Ethics (7 Lectures)

Publication Ethics: Definition, introduction and importance Best practices/standards setting initiatives and guidelines: COPE, WAME etc. Conflicts of interest, Publication misconduct: definition, concepts, problems that lead to unethical behaviour and vice versa, types, Violation of publication ethics, authorship and contributor-ship, Identification of publication, misconduct, complaints and appeals, Predatory publishers and journals, Practice

UNIT-IV: Open Access Publishing (4 Practical)

Open access Publications and Initiatives ,SHERPA/ROMEO online resource to check publisher copyright and self-archiving policies Software tool to identify predatory publications developed by SPPU , Journal finder/journal suggestion tools viz. JANE, Elsevier Journal finder, Springer journal suggester, etc.

UNIT-V: Publication Misconduct (4 Practical)

A. Group Discussions: Subject specific ethical issues, FFP, authorship Conflicts of interest, Complaints and appeals: examples and fraud from India and Abroad

B. Software tools: Use of plagiarism software like Turnitin, Urkund and other open-source software tools, Use of Referencing software like Mendeley, Zotero etc

UNIT-VI: Data Bases and Research Metrics (7 Practical)

A. Databases,: Indexing Databases, Citation Databases: Web of Science, Scopus etc.

B. Research Metrics, Impact factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score Metrics: h-index, g index, I 10 index, alt metrics

Suggested Readings:

1. The students' guide to Research Ethics by Paul Oliver Open University Press, 2003

2. Responsible conduct of Research by Adil E. Shamoo; David B. Resnik Oxford University Press, 2003

3. Anderson B.H., Dursaton, and Poole M.: Thesis and Assignment writing, Wiley Eastern 1997.

Reference Books:

1. S. B. Kishor, A.S. Kushwaha, Research and Publication Ethics, Das Ganu Prakashan, Nagpur,
2. Y. Sharma., A. Sharma, Textbook of Research and Publication Ethics, Kalyani Publishers.

Swayam Link- https://onlinecourses.swayam2.ac.in/nou24_ge73/preview

SDG Mapping with this course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Promoting ethical research and academic integrity

SDG 9	Industry, Innovation and Infrastructure	Supporting research quality and innovation
SDG 12	Responsible Consumption and Production	Responsible dissemination and use of research findings
SDG 16	Peace, Justice and Strong Institutions	Promoting transparency, accountability, and ethical standards

Course code	**Title**	**L-T-P**	**Credit**
TR50055	**RESOURCE MANAGEMENT AND TRIBAL DEVELOPMENT**	**3-1-0**	**4**

Course Objectives:

The objectives of this course are

This course helps students understand natural resources of tribal regions, indigenous livelihood practices, tribal welfare programmes, and sustainable development approaches while developing research and planning skills for integrated tribal community development.

Course Outcomes:

On the completion of this course, students should be able to:

CO1: Understand concept, meaning, scope and types of natural resources of the tribal regions.

CO2: Understand good governance in the field of tribal development and train students as change agents in the field of tribal development.

CO3: Gain knowledge on tribal welfare programs, sub-plans and related challenges in the socio-economic and overall development of tribal regions.

CO4: Develop adequate skills to prepare and implement integrated development plans.

CO5: Learn about indigenous methods of resource exploitation, livelihood generation, and natural resource-based small and cottage industries**.**

CO–PO–PSO Mapping

Program Outcomes →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
Course Outcomes ↓																	
CO1	3	2	1	2	1	2	2	1	–	–	–	2	3	2	1	3	2
CO2	3	3	2	2	2	3	2	2	1	–	–	2	3	3	2	2	3
CO3	3	3	2	3	2	3	2	2	2	1	–	3	3	3	3	2	3
CO4	3	3	3	3	3	2	3	2	2	2	1	2	3	3	2	3	3
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	2.2	2.6	2.2	2.6	2.4	2	1.6	1	0.6	2.4	3	2.8	2.2	2.6	2.8
1 – Weakly Mapped (Low)										**3 – Strongly Mapped (High)**							
2 – Moderately Mapped (Medium)										**“–” = No correlation**							

Unit-I: Tribal Development Policies, Programmes and Governance

Historical Perspectives of Tribal Development Policy:

Constitutional identity, The fifth and sixth schedule of the Indian Constitution, Commission and committees on tribal Development, National Tribal Development Policy 2005, Tribal Sub-Plans, TDA and ITDA approaches.

Protection of Tribal Rights and Governance:

United Nations Declaration on Rights of Indigenous People, ILO Convention on rights of Indigenous people, Forest Dwellers protection Act, Institutions in Tribal Governance: Tribal Development administrative structure at central and state level. National Commission on Scheduled Tribes. National Council for Tribal Welfare. TRIFED, Tribal Advisory Councils.

UNIT–II: Natural Resources and Tribal Livelihood

Tribal Livelihood: Concept, meaning and nature of livelihood. Factors affecting livelihood, migration, displacement and dispossession

Forms of Tribal Livelihood: Land and water based – traditional land cultivation, shifting cultivation. Forest based – food gathering, gum, timber, honey, seasonal food collection. Livestock based – consumption-based livestock production, milk, cattle rearing.

Tribal Entrepreneurship: i) Timber based processing, ii) Food processing, forest and agro-food processing, iii) Plate and rope making, iv) Pottery, terracotta, stone and horn based crafts, handloom, bamboo-based weaving, etc. V) Odisha Livelihood Mission and Tribal Welfare.
Livelihood Intervention: Land and water-based intervention – improved agricultural practices, improved crop productivity, increasing cropping intensity, fisheries, watershed management, soil and water conservation activities, and horticultural plantation.
Forest Based Intervention: Forest conservation, gum, honey and timber collection and marketing through self-help groups and co-operative societies, social forestry, medicinal plants, collection of Kendu leaves.
Livestock Based Intervention: Cattle rearing – cows and buffaloes, goat rearing, sheep rearing, poultry.
Challenges in Livelihood: Traditional issues of tribal livelihood, changing nature of tribal livelihood issues. State policies of tribal livelihood. Tribal Livelihood: Case studies.

UNIT–III: Resource Management and Sustainable Tribal Development

Understanding Natural Resources: Concept of Natural Resource Management and sustainability. A) Forests – Types, functions, ownership, control and regulatory systems, current issues of forests and its sustainability (degradation, conflicts, competing user rights and entitlements).B) Water – Water for life, livelihood, health and sanitation. Ownership, access and regulatory systems. Current issues of water and its sustainability. Implications of declining water resources and deteriorating quality – water pollution, unequal access, etc.) C) Land – Changing land use and cropping pattern, land ownership of tribals. Corporatisation, displacement, and problem of sustainability. D) Energy – Utilisation of renewable and non-renewable energy. Current issues and alternatives of energy and its sustainability.

Natural Resource Management: Participatory methods, Participatory Rural Appraisal (PRA), Participatory Resource Mapping (PRM), role of NGOs and Civil Society Organizations in Resource Management and Sustainable Tribal Development.

UNIT–IV: Tribal Society, Culture and Heritages: Issues in Development

Social Organisations: Tribal family, marriage, kinship, Yuva gruh, religion and customary practices.

Economic Organisations: Concept, forms, functions and changing nature.

Political Organisations: Tribal council, customary laws and practices.

Tribal Culture: Dance, drama, folklore, dialect, instruments, religion, customs, rituals and festivals, literature, tribal art and crafts, life philosophy in cultural practices.

Tribal Problems and Transformation: Detribalisation, ‘Sanskritization’ and religion and cultural conflicts, customary laws, infrastructural issues of habitat and settlements, basic civic amenities.

Transportation and communication; economic issues of land alienation and agriculture; poverty and indebtedness; unemployment; educational issues – accessibility and drop-out; migration; health issues – accessibility and utilisation, mortality and morbidity, reproductive health status, malnutrition and anaemia, disease burden, sickle cell anaemia; superstitions, addiction and isolation.

UNIT–V: Tribal Sub-Plans and Welfare Programmes

Particularly Vulnerable Tribal Groups (PVTGs) in India; Tribal Development in Odisha: an overview; strategies for Tribal Development in Odisha – Tribal Sub-Plans; welfare schemes and programmes of state and central sector; NGOs working in Tribal Areas of Odisha and their field of activities; Mission Shakti and Self-Help Groups; specific tribe-oriented development programs.

Suggested Readings:

1. Dwarika Nath Padhy (2002). Role of Co-operatives for Tribal Development. Mohit Publications, New Delhi.

2. Government of India (2014). Report of the High-Level Committee on Socioeconomic, Health and Educational Status of Tribal Communities of India. New Delhi: Ministry of Tribal Affairs, Government of India, May 2014.
3. Joshi, Vidyut and Chandrakant Upadhyaya (2017). Tribal Situation in India. New Delhi: Rawat Publications.
4. Menon, Ajit; Singh, Praveen; Shah, Esha; Lele, Sharachchandra; Paranjape, Suhas; Joy, K. J. (2007). Community-Based Natural Resource Management: Issues and Cases from South Asia. New Delhi: Sage.

Note: Latest edition of the text books should be used.

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 1	No Poverty	Tribal livelihood development and poverty alleviation programmes
SDG 2	Zero Hunger	Food security, sustainable agriculture, and livelihood enhancement
SDG 3	Good Health and Well-Being	Tribal health awareness, nutrition, and welfare programmes
SDG 4	Quality Education	Skill development, awareness, and research training
SDG 5	Gender Equality	Women empowerment through SHGs and participatory development
SDG 6	Clean Water and Sanitation	Water resource management and sanitation awareness
SDG 8	Decent Work and Economic Growth	Tribal entrepreneurship, cottage industries, and sustainable livelihoods
SDG 10	Reduced Inequalities	Tribal welfare programmes and inclusive development policies

SDG 12	Responsible Consumption and Production	Sustainable utilization and conservation of natural resources
SDG 13	Climate Action	Sustainable environmental practices and resource conservation
SDG 15	Life on Land	Forest conservation, biodiversity protection, and sustainable ecosystem management
SDG 16	Peace, Justice and Strong Institutions	Tribal governance, constitutional rights, and institutional support
SDG 17	Partnerships for the Goals	Role of NGOs, civil society organizations, and participatory governance

Course code	**Title**	**L-T-P**	**Credit**	
UR50031	**URBAN SETTLEMENT AND PLANNING**	**3-1-0**	**4**	

Course Learning Objectives: The objective of this course is to provide opportunity to the learners to deepen their knowledge and understanding of urban planning process. The students will get clear understanding on various theoretical and practical aspects of urban planning. They will gain knowledge and skills in formulation, implementation, monitoring and evaluation of urban development programmes.

Course Learning Outcomes: On successful completion of this course the students shall enable to:

CO1: Remember origin and evolution of towns.

CO2: Understand the urban planning process.

CO3: Apply their knowledge and skills to various practical aspects of urban planning.

CO4: Analyse the quantitative and qualitative classifications of towns.

CO5: Evaluate the urban issues, land use, transport and related problems.

CO–PO–PSO Mapping

Program Outcomes →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
Course Outcomes ↓																	
CO1	3	2	1	1	–	1	1	1	–	–	–	1	3	2	1	1	1
CO2	3	3	2	2	1	2	2	2	1	–	–	1	3	3	2	2	2
CO3	3	3	2	3	2	2	2	2	2	1	–	2	3	3	3	2	2
CO4	3	3	3	3	2	2	2	3	2	2	1	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	2.2	2.4	1.6	2	2	2.2	1.6	1	0.6	1.8	3	2.8	2.4	2.2	2
1 – Weakly Mapped (Low)										**3 – Strongly Mapped (High)**							
2 – Moderately Mapped (Medium)										**“–” = No correlation**							

Course Inputs:

UNIT-I: Development of Urban Geography, Origin and Evolution of Towns (Factors, Stages of Evolution) Trend of Urbanization in India, Factors Influencing types of Urban Morphology.

UNIT-II: Theories of Urban Morphological Growth: Axiate Theory, Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory. Composite Theory, Basic and Non-Basic functions of towns, Functional Classification of Towns-, Quantitative and Qualitative Classification of Towns.

UNIT-III: Functional Zones- C.B. D, Rank-Size Rule and City Primacy, Umland, Urban Fringe and City Region, Need and Objective of urban Planning, Urban Issues and Planning Theories, Urban Land use, Transport, Water, Sanitation, Drainage and Sewage, Growth of Slums and related problems.

UNIT-IV: National Urbanization Policies and 74th Constitutional Amendment Act-Salient Features. Urban poverty, development plan: Planning process, components and techniques; Concept of a Master Plan; its elements, preparation and implementation; Perspective Plan, Zonal plan; Participatory and inclusive planning.

UNIT-V: Planning Legislation: legislation as tools of plan implementation and development; Review of Planning legislation in India, complaint and redressal mechanism, Functions of SUDA, Role and Functions of Urban Development Authorities, Planning of Smart Cities.

Text Book Recommended:

1. Ramachandran, R. (1992), The Study of Urbanisation, Oxford University Press, Delhi.
2. Mumford, L. (1972) The City in History: Its Origins, Its Transformations, and Its Prospects
3. Hall, P.G. (1996) (Updated Edition), Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century

References

1. Fyfe, N. R. and Kenny, J. T. (2005), The Urban Geography Reader, Routledge
2. Graham, S. and Marvin S. (2001): Splintering Urbanism: Networked Infrastructures, Technological Mobility and the Urban Condition, Routledge
3. Hall, T. (2006), Urban Geography, Taylor and Francis
4. Kaplan, D. H., Wheeler J. O. and Holloway S. R. (2008) Urban Geography, John Wiley
5. Knox, P. L. and McCarthy L. (2005): Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York
6. Knox, P. L. and Pinch S., (2006): Urban Social Geography: An Introduction, Prentice Hall.
7. Ramachandran, R (1989): Urbanisation and Urban Systems of India, Oxford University Press, New Delhi
8. Singh, R.B. (Eds.) (2001), Urban Sustainability in the Context of Global Change, Science Pub., Inc., Enfield (NH), USA and Oxford and IBH Pub., New Delhi.

Note: Latest edition of the text books should be used.

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Development of urban planning knowledge and analytical skills
SDG 6	Clean Water and Sanitation	Urban water supply, sanitation, drainage, and sewage planning
SDG 9	Industry, Innovation and Infrastructure	Urban infrastructure planning and smart city development
SDG 10	Reduced Inequalities	Inclusive urban planning and slum improvement
SDG 11	Sustainable Cities and Communities	Sustainable urbanization, transport, housing, and urban governance
SDG 13	Climate Action	Sustainable land use planning and urban environmental management
SDG 16	Peace, Justice and Strong Institutions	Urban governance, planning legislation, and participatory planning
SDG 17	Partnerships for the Goals	Collaboration among planning authorities, communities, and institutions

Course code	Title	Credit	L-T-P
UR50033	URBAN ENVIRONMENTAL PLANNING AND MANAGEMENT	4	3-1-0

Course Learning Objectives:

The objective of the course is to provide theoretical aspects and managerial techniques required in the contemporary urban environmental management. It aims to create an interdisciplinary teamwork orientation, with the acquired knowledge and skills using innovative approaches and competencies required to synthesize the acquired knowledge to solve real-life urban environmental challenges. Approaches such as Framework Analysis and Environmental Assessment are intended to be given through the course under analysis and real-world case studies focusing on selected themes like modes of governance, environmental sustainability, and regulatory processes, etc.

Course Learning Outcomes: On Successful completion of this course the students shall be able to:

CO1: Remember the concept of urban environment
CO2: Understand the environmental quality and urban health management
CO3: Apply the compressive perspective of planning for urban quality of life.
CO4: Analyse the governance need for sustainable development.
CO5: Evaluate the policy framework and protection mechanism.

CO–PO–PSO Mapping

Program Outcomes →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
Course Outcomes ↓																	
CO1	3	2	1	1	1	2	1	2	–	–	–	2	3	2	2	1	2
CO2	3	3	2	2	2	2	2	2	1	–	–	2	3	3	2	2	2
CO3	3	3	2	3	2	3	2	2	2	1	–	2	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2	1	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3
Average	3	2.8	2.2	2.4	2.2	2.6	2.2	2.2	1.6	1	0.6	2.4	3	2.8	2.4	2.4	2.4

1 – Weakly Mapped (Low)	**3 – Strongly Mapped (High)**
2 – Moderately Mapped (Medium)	**"–" = No correlation**

Course Inputs

UNIT - I: Principles of Urban Environmental Management (UEM)

Urban Environmental Quality and Health, Urban Environmental Technology, Circular Urban Metabolism, Sustainable Resource Management, UEM Approaches: Urban Harvest Approach and the Natural Step:
UEM Tools: Ecological Footprint, Mass Flow Analysis, Life Cycle Analysis,Basic understanding of environmental quality of (urban) water, energy, waste, air, agriculture, and services; its history and natural cycles and relevant indicators to monitor it.

UNIT - II: Planning for Urban Quality of Life

Basic concepts of urban planning, Interaction between urban planning and urban sustainability, Relationship between the urban fabric and human activities. Analysis of spatial organization for urban planning and its interaction with the urban environment and sustainability

Identification and inclusion of relevant qualitative as well as quantitative data in urban planning processes. Application of methods and tools for environmental assessment in the context of urban and environmental planning, Urban Green Space Planning

UNIT - III: Governance for Sustainable Cities

Introduction to the governance of sustainable cities, Overview on the political, economic, and social dynamics that influence the growth and development of cities, International and national context of urban sustainability, Institutionalization of environmental policy and sustainable development at the local level.

UNIT – IV: Urban Sustainability, Environmental Governance and Climate Change Policies

General concepts and debates relevant for the analysis of urban sustainability, Basic concepts and theories on governance, stakeholders, and citizen participation, Specific issues related to environmental policy in urban environments, Air quality and city climate, Mechanisms of urban air pollution; Local climate change policies including adaptation and mitigation policies, Scenarios and alternatives for the city of the future: Reducing environmental damage, Reducing natural resource consumption by cities

UNIT - V: Policy Framework and Protection Mechanisms

Urban Policy Framework, Policies for Urban Environment, Policies Pertaining to Urbanization, Urban Development and Environment Protection Mechanisms in India, Vision for the city

Text Book Recommended:

Roo. G.D. and Miller, D. (2004), Urban Environmental Planning: Policies, Instruments and Methods in an international Perspectives, Routledge
Robert, F. (Ed), 1993, Spirited Cities, Urban Planning, Traffic and Environmental Management in the Nineties, The Federation Press, Sydney.

References:

Ramachandran, R. (1992), The Study of Urbanisation, Oxford University Press, Delhi
Mumford, L. (1972), The city in History: its Origins, its transformation and its Prospects

Hall, P.G. (1996) (Updated Edition), Cities o Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century.

Reference Website/ Webnotes

1. https://www.researchgate.net/publication/237832182_URBAN_ENVIRONMENTAL_PLANNING_AND_MANAGEMENT_REVIEWED_FROM_A_SUSTAINABILITY_PERSPECTIVE_REFORM_OR_TRANSFORMATION
2. https://doi.org/10.1016/j.proenv.2016.04.005
3. https://onlinecourses.nptel.ac.in/e-learning/preview/noc25_ar08
4. https://egyankosh.ac.in/bitstream/123456789/39131/1/Unit-2.pdf

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-Being	Urban environmental quality, air quality, and healthy urban living
SDG 6	Clean Water and Sanitation	Sustainable urban water management and sanitation planning
SDG 7	Affordable and Clean Energy	Sustainable resource management and energy efficiency
SDG 9	Industry, Innovation and Infrastructure	Sustainable urban infrastructure and innovative planning approaches
SDG 11	Sustainable Cities and Communities	Urban sustainability, green space planning, and inclusive urban development
SDG 12	Responsible Consumption and Production	Circular urban metabolism and sustainable resource use
SDG 13	Climate Action	Climate adaptation, mitigation policies, and urban environmental management
SDG 15	Life on Land	Urban biodiversity conservation and environmental protection
SDG 16	Peace, Justice and Strong Institutions	Governance, environmental policy, and citizen participation
SDG 17	Partnerships for the Goals	Stakeholder participation and collaborative urban environmental governance

Semester-IV

Course code	Title	Credit	L-T-P
FD50082	**Fieldwork and Dissertation**	**20**	**0-0-20**

Course Objectives

The course aims to provide students with comprehensive knowledge of geographical research methods and field-based investigations. It enables students to understand the principles of geographical inquiry, develop skills in primary and secondary data collection, spatial analysis, interpretation of geographical phenomena, and scientific report writing. The course also strengthens students' abilities to apply geospatial techniques and research methodologies in addressing contemporary environmental, social, and regional planning issues.

Course Learning Outcomes

CO1: Demonstrate an understanding of geographical research methodology and develop competency in qualitative and quantitative data collection, spatial analysis, and interpretation.

CO2: Identify and investigate geographical problems through field surveys, geospatial techniques, and scientific research methods.

CO3: Analyze physical, environmental, socio-economic, and regional issues using appropriate geographical tools, statistical techniques, and GIS-based methods.

CO4: Develop skills in thematic mapping, spatial data visualization, report preparation, and scientific documentation following academic standards.

CO5: Demonstrate competence in dissertation writing, seminar presentation, and publication-oriented academic research in Geography.

CO–PO–PSO Mapping

Program Outcomes → / Course Outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	2	3	1	2	2	2	3	3	3	3	3	2	2
CO2	2	3	2	3	3	3	2	2	3	2	3	3	3	3	3	3	2
CO3	2	3	2	3	2	2	1	2	2	2	2	2	3	2	2	2	2

CO4	2	3	3	2	2	3	1	3	3	2	3	3	3	3	3	3	2
CO5	2	3	3	3	2	3	1	3	3	3	3	3	3	3	3	3	3
Average	**2**	**3**	**2.4**	**2.8**	**2.2**	**2.8**	**1.2**	**2.4**	**2.6**	**2.2**	**2.8**	**2.8**	**3**	**2.8**	**2.8**	**2.6**	**2.2**

Mapping Scale:	
1 – Low (Weakly Mapped)	3 – High (Strongly Mapped)
2 – Medium (Moderately Mapped)	"–" No Correlation

Fieldwork and Dissertation [600 Lab Contact Hours]

Each student shall have to undergo training for learning and use of different techniques of scientific data collection during 30 days of fieldwork under the supervision of a teacher, as nominated by the head of the Programme in a rural, urban, tribal, coastal, environmental, or other geographical study area relevant to the research topic. During the field investigation, students shall learn and apply various geographical research techniques, including field observation, questionnaire survey, GPS-based data collection, mapping, environmental measurements, spatial data analysis, and the use of geospatial technologies wherever applicable.

The Programme shall announce the exact date of commencement of fieldwork. Student failing to complete the fieldwork in a particular year can only clear the paper by completing fieldwork next year. Dissertation is to be prepared by the student under the supervision of the concerned teacher. The student is required to submit the dissertation through the supervising teacher to the Head of the Programme for its evaluation at least fifteen days in advance of the date notified for examination. The dissertation shall be evaluated by an external examiner in consultation with the internal examiner (the supervising teacher). The candidate shall be awarded grade both by the internal and external examiners on the basis of his/her dissertation, seminar presentation and viva voice.

Evaluation Scheme

Sl. No.	Mode of Evaluation	Credits
1	Selection of Research Topic and Synopsis Presentation	4
2	Literature Review and Preparation of Research Tools (Questionnaire, Schedule)	4
3	Fieldwork and Data Collection	4
4	Data Analysis, Mapping and Dissertation Writing	4
5	Seminar Presentation and Viva Voce	4
Total		**20**

The dissertation must be submitted positively before the End Semester Examination.

SDG Mapping

SDG No.	Sustainable Development Goal	Nature of Contribution
SDG 4	Quality Education	Develops research competency, field investigation skills, geospatial analysis, and scientific writing.
SDG 5	Gender Equality	Encourages gender-sensitive field surveys and inclusive geographical research practices.
SDG 8	Decent Work and Economic Growth	Enhances employability through field techniques, GIS applications, analytical and research skills.
SDG 9	Industry, Innovation and Infrastructure	Promotes innovation through GIS, Remote Sensing, GPS, spatial analysis, and modern research methodologies.
SDG 11	Sustainable Cities and Communities	Supports research on urban planning, rural development, settlement studies, and sustainable regional planning.
SDG 13	Climate Action	Encourages research on climate change, environmental management, disaster risk reduction, and adaptation strategies.
SDG 15	Life on Land	Promotes sustainable land resource management, biodiversity conservation, land use planning, and ecosystem assessment.
SDG 17	Partnerships for the Goals	Encourages collaborative research involving communities, government agencies, NGOs, and interdisciplinary institutions.

Suggested Readings

- Ahuja, R. (2010). *Research Methods*. Rawat Publications.
- Bryman, A. (2016). *Social Research Methods*. Oxford University Press.
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Sage Publications.
- Gomez, B., & Jones, J. P. (2010). *Research Methods in Geography*. Wiley-Blackwell.
- Hay, I. (Ed.). (2021). *Qualitative Research Methods in Human Geography*. Oxford University Press.
- Kothari, C. R. (2004). *Research Methodology: Methods and Techniques*. New Age International.
- Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. *Geographical Information Systems and Science*. Wiley.
- Robinson, A. H., et al. *Elements of Cartography*. John Wiley & Sons.

Singh, G. (2012). *Map Work and Practical Geography*. Vikas Publishing House.

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