KISS

KALINGA INSTITUTE OF SOCIAL SCIENCES

CURRICULUM AND CREDIT FRAMEWORK FOR UNDERGRADUATE PROGRAMME

BACHELOR OF ARTS/SCIENCE IN GEOGRAPHY

(As per NEP-2020, NCrF, NHEQF)

Academic Session 2026-2027



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

About the School

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 endeavors 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.

About the Department

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. The Department offers B.A./B.Sc. (Honours) in Geography in alignment with the National Education Policy (NEP) 2020, emphasizing multidisciplinary learning, skill development, experiential education, and research. The programme provides a strong foundation in physical and human geography while integrating tribal resource management, environmental sustainability, and modern

geospatial technologies such as GIS, Remote Sensing, and GNSS. Through fieldwork, laboratory training, internships, community engagement, and project-based learning, students develop analytical, technical, and problem-solving skills. The curriculum prepares graduates for higher education, research, government and private sector employment, entrepreneurship, and geospatial careers, while fostering ethical values and contributing to sustainable development and the achievement of the Sustainable Development Goals (SDGs).

Vision & Mission of the School

Vision

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

Mission

- Foster all-round development through multi-faceted education.
- Focus on sustainable resource management through innovative courses.
- Engage with communities to promote entrepreneurship and leadership.
- Manage resources effectively to create employment and self-employment opportunities.

Programme Overview

Programme Title:

B.A/ B.Sc. in Geography with specialization in Tribal Resource Management

Programme Type:

Undergraduate Programme

Programme Description

The B.A./B.Sc. (Honours) in Geography with Specialization in Tribal Resource Management is an interdisciplinary undergraduate programme designed in accordance with the National Education Policy (NEP) 2020. The curriculum is structured around Discipline Specific Courses (Core), Minor Courses, Multidisciplinary/Interdisciplinary Courses (MDC/IDC), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Internship/Dissertation, and Value Added Courses (VAC) to provide holistic, flexible, and outcome-based education. The programme integrates physical and human geography with tribal resource management,

environmental sustainability, and geospatial technologies, while emphasizing experiential learning through fieldwork, laboratory training, internships, research, and community engagement. Aligned with the National Higher Education Qualifications Framework (NHEQF) and the Sustainable Development Goals (SDGs), the programme equips students with disciplinary knowledge, practical skills, ethical values, and professional competencies for higher education, research, entrepreneurship, and diverse career opportunities.

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 transfer' 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 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	Revision, project completion	13

Component	Operational Definition	Hours (Example for 4-credit course)
Preparation		
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.

NCrF Category Wise Credit Distribution (UGC CCFUP Compatible) (for UG Programme)

Semester	Discipline Specific courses- core		Minor		MDC/IDC		AEC		SEC/ Internship/ Dissertation		VAC		Grand Total Credits
	No. Of Papers	Total Credits	No. Of Papers	Total Credits	No. Of Papers	Total Credits	No. Of Papers	Total Credits	No. Of Papers	Total Credits	No. Of Papers	Total Credit	
I	1	4	1	4	1	3	1	2	1	3	1	4	20
II	1	4	1	4	1	3	1	2	1	3	2	4	20
III	2	8	1	4	1	3	1	2	1	3			20
IV	4	14	1	4			1	2					20
V	4	16	1	4					1	2			22
VI	4	16	1	4									20
VII	4	16	1	4									20
VIII	1	4	1	4					1	12			20
Total Credits for the Course		80		32		9		8		23		12	162

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.

vii. Eligibility for Admissions with No. of Seats

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

viii. Examination Pattern:

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:

- Selection of Research Topic and Synopsis Presentation
- Literature Review and Preparation of Research Tools (Questionnaires and schedule)
- Fieldwork and Data Collection
- Data Analysis and Report Writing
- 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)	2x1=2	2x2=4

	and Answer any 2 out of 3 question (without practical)		
Part-III- Short Type	**Answer within 250 words Answer any 1 out of 2 questions (with practical) and answer any 2 out of 3 questions (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.

Milestone / Year Completed	Exit Award	NHEQF Level	Standard Credit Range
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
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: Enable students to build successful careers in public/private sectors, entrepreneurship, or community development.

PEO2: Promote interdisciplinary and multidisciplinary learning and research.

PEO3: Develop entrepreneurial, analytical, and problem-solving skills.

PEO4: Prepare students for higher education, professional certifications, and research.

PEO5: Foster lifelong learning, ethical conduct, and social responsibility.

NHEQF-Aligned Programme Educational Objectives (PEOs)

*PEOs must describe achievements expected **5–6 years after graduation**, aligned to:*

- *Employability*
- *Entrepreneurship*
- *Research readiness*
- *Social responsibility*
- *Indigenous knowledge integration*

Programme Outcomes (PO)

(Aligned with NEP-2020 Graduate Attributes; Schools may customize.)

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 Undergraduate Programme
B.A./B.Sc. in GEOGRAPHY
SEMESTER-I

Course Category		Course Code	Course Title	Credits			Total Credits
				L	T	P	
Core Course (Major)		GO10001	Principles of Geomorphology	3	1	0	4
Minor (Choose any one or any other course from Arts or Science stream offered by university) This may be opted by another Department.	Management	MC12001	Management Principles and Applications	3	1	0	4
	Economics	EC12001	Principles of Microeconomics	3	1	0	4
	Sociology	SO12001	Invitation to Sociology	3	1	0	4
Multidisciplinary (MDC) (or any other course from Arts or Science stream offered by University)		CC13001	Financial Literacy	2	1	0	3
Ability Enhancement Course (AEC) (Choose any One)		AE14001	Modern Indian Language (Odia)	2	0	0	2
		AE14003	Modern Indian Language (Hindi)	2	0	0	2
		AE14005	Modern Indian Language (Sanskrit)	2	0	0	2
		AE14007	Modern Indian Language (Santhali)	2	0	0	2
		AE14009	Alternative English	2	0	0	2
Skill Enhancement Course (SEC) (Lab)		SK15001	Statistics for Social Sciences	2	0	1	3
Value Added Course (VAC)		VA16201	Environment Education and Disaster Management	3	0	1	4
			Total				**20**

SEMESTER-II

BA/ B.Sc. in Geography - NEP 2020
School of Tribal Resource Management 2026-27

Course Category		Course Code	Course Title	Credits			Total Credits
				L	T	P	
Core Course (Major)		GO10002	Human Geography	3	1	0	4
Minor (Choose any One or any other course from Arts or Science stream offered by University) This may be opted by another Department	Management	MC12002	Business Environment	3	1	0	4
	Economics	EC12002	Principles of Macroeconomics	3	1	0	4
	Sociology	SO12002	Social change in India	3	1	0	4
Multidisciplinary (MDC) (or any other course from Arts or Science stream offered by University)		CS13002	Data Analytics	2	0	1	3
Ability Enhancement Course (AEC) (Choose any one)		AE14002	Translation Studies (Odia)	2	0	0	2
		AE14004	Translation Studies (Hindi)	2	0	0	2
		AE14006	Translation Studies (Sanskrit)	2	0	0	2
		AE14008	Translation Studies (Santhali)	2	0	0	2
		AE14010	Translation Studies (English)	2	0	0	2
Skill Enhancement Course (SEC)		TR15002	Professional Readiness and Development	2	1	0	3
Value Added Course (VAC) (Choose any one)		VA16124	Enhancement of Active Citizenship and Democratic Values	2	0	0	2
		VA16134	Inclusive Education and Gender Equality	2	0	0	2
		VA16142	Combating Radicalism through Educaion	2	0	0	2

	VA16146	Indian Knowledge System	2	0	0	2
	VA16394	Flutter Application Development	1	0	1	2
Value Added Course (VAC) (Choose any one)	VA16422	Human Values and Professional Ethics	2	0	0	2
	VA16430	Life Skills Education	2	0	0	2
	VA16482	Self-help and Happiness	2	0	0	2
	VA16484	Community Engagement and Social Responsibility	2	0	0	2
	VA16486	Pioneering Service Learning and Community Development	2	0	0	2
	VA16488	Sports and Yoga	2	0	0	2
		Total				**20**

Exit Point: Undergraduate Certificate

Students exiting the programme after securing 40 credits will be awarded a UG Certificate in the relevant Discipline /Subject provided they secure 4 credits in work-based vocational courses offered during the summer term or internship / Apprenticeship in addition to 6 credits from skill-based courses earned during the first and second semester.

SEMESTER-III

Course Category		**Course Code**	**Course Title**	**Credit Hours (Weekly)**			**Total Credit**
				L	**T**	**P**	
Core Course (Major)		GO20001	Climatology	3	1	0	4
		GO20003	Oceanography	3	1	0	4
Minor (Choose any other course from Arts or Science	Management	MC22001	Principles of Rural Marketing	3	1	0	4
	Economics	EC22001	Managerial Economics	3	1	0	4
	Sociology	SO22001	Social Stratification and Mobility	3	1	0	4

stream offered by University) This may be opted by another Department							
Multidisciplinary (or any other course from Arts or Science stream offered by University)		CS23001	Introduction of Artificial Intelligence and Machine Learning	2	0	1	3
Ability Enhancement Course (AEC)		AE24001	Communicative English	2	0	0	2
Skill Enhancement Course (Lab) OR (Any other course from Arts or Science stream offered by University)		GO25001	Basic QGIS	2	0	1	3
		Total					**20**

SEMESTER-IV

Course Category		**Course Code**	**Course Title**	**Credit Hours (Weekly)**			**Total Credit**
				L	**T**	**P**	
Core Course (Major)		GO20002	Evolution of Geographical Thought	3	1	0	4
		GO20004	Economic Geography	3	1	0	4
		GO20006	Environmental Geography	3	1	0	4
		GO20082	Experimental Environmental Geography	0	0	2	2
Minor (Choose (any one or any other course from Arts or Science	Management	MC22002	Tribal Entrepreneurship and Development	3	1	0	4
	Economics	EC22002	Fundamentals of Money and Banking				

stream offered by University This may be opted by another Department	Sociology	SO22002	Sociology of Education				
Ability Enhancement Course		AE24002	Professional Communication	2	0	0	2
			Total				**20**

Exit Point: Undergraduate Diploma

Students exiting the programme after securing 80 credits will be awarded a UG Diploma in the relevant Discipline /Subject provided they secure an additional 4 credits in skill based vocational courses offered during the first year or second year

SEMESTER-V (Single Major)

Course Category		**Course Code**	**Course Title**	**Credits**			**Total Credits**
				L	**T**	**P**	
Core Course (Major)		GO30001	Regional Planning and Development	3	1	0	4
		GO30003	Population Geography	3	1	0	4
		GO30005	Geography of India	3	1	0	4
		GO30007	Statistical Methods in Geography	3	1	0	4
Minor (Choose any one or any other course from Arts or Science	Management	MC32001	Human Resource Management	3	1	0	4
	Economics	EC32001	Indian Economy	3	1	0	4
	Sociology	SO32001	Social Problem in India	3	1	0	4

stream offered by University) This may be opted by another Department							
Internship		IP37081	Internship	0	0	2	2
			Total				**22**

SEMESTER-V (Double Major)

Course Category		**Course Code**	**Course Title**	**Credits**			**Total Credit**
				L	T	P	
Core Course (Major)		GO30001	Regional Planning and Development	3	1	0	4
		GO30003	Population Geography	3	1	0	4
		GO30005	Geography of India	3	1	0	4
		GO30007	Statistical Methods in Geography	3	1	0	4
Minor /Double Major (Choose any One or any other course from Arts or Science stream offered by University) This may be opted by another Department	Management	MC32001	Human Resource Management	3	1	0	4
		MC32003	Operation Management	3	1	0	4
		MC32005	Product and Brand Management	3	1	0	4
		MC32007	Tourism and Hospitality Management	3	1	0	4
	Economics	EC32001	Indian Economy	3	1	0	4

		EC32003	Economics of Growth and Development	3	1	0	4
		EC32005	Economics of Social Sector	3	1	0	4
		EC32007	History of Economic Thought	3	1	0	4
	Sociology	SO32001	Social Problem in India	3	1	0	4
		SO32003	NGO Management	3	1	0	4
		SO32005	Sociology of religion	3	1	0	4
		SO32007	Gender Sensitization	3	1	0	4
Internship		IP37081	Internship	0	0	4	2
			Total				**20**

Exit Point: Bachelor's Degree with Hons.

Students who want to undertake a 3-year UG Programme will be awarded a UG Degree in the relevant Discipline /Subject upon securing 120 credits

SEMESTER-VI (Single Major)

Course Category	**Course Code**	**Course Title**	**Credit Hours (Weekly)**			**Total Credit**
			L	T	P	
Core Course (Major)	GO30002	Climate Resilience and Disaster Risk Management	3	1	0	4
	GO30004	Urban Geography	3	1	0	4
	GO30006	Agricultural Geography	3	1	0	4
	GO30008	Cartography	3	0	2	4
Minor (Choose any one or any other course from Arts or Science stream offered by University) This may be opted by another Department	MC32002	Human Resource Management	3	1	0	4
	EC32002	Environment and Development	3	1	0	4
	SO32002	Sociology of Tribes	3	1	0	4
		Total				20

SEMESTER-VI (Double Major)

Course Category		Course Code	Course Title	Credits			Total Credit
				L	T	P	
Core Course (Major)		GO30002	Climate Resilience and Disaster Risk Management	3	1	0	4
		GO30004	Urban Geography	3	1	0	4
		GO30006	Agricultural Geography	3	1	0	4
		GO39008	Cartography	3	0	2	4
Minor /Double Major (Choose any One or any other course from Arts or Science stream offered by University) This may be opted by another Department	Management	MC32002	Human Resource Management	3	1	0	4
		MC32004	Operation Management	3	1	0	4
		MC32006	Product and Brand Management	3	1	0	4
		MC32008	Tourism and Hospitality Management	3	1	0	4
	Economics	EC32002	Environment and Development	3	1	0	4
		EC32004	Economic Development and Policy in India	3	1	0	4
		EC32006	Money and Financial Market	3	1	0	4
		EC32008	Public Finance	3	1	0	4
	Sociology	SO32002	Sociology of Tribes	3	1	0	4
		SO32004	Gender and Violence	3	1	0	4
		SO32006	Social Welfare and Administration	3	1	0	4
		SO32008	Tribal Problems in India	3	1	0	4
			Total				**20**

SEMESTER-VII (Single Major)

(Without Research/ With Research)

Course Category	Course Code	Course Title	Credit Hours (Weekly)			Total Credit
			L	T	P	
Core Course (Major)	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
Minor (Choose any one or any other course from Arts or Science stream offered by University) This may be opted by another Department	Management	MC42001	Mental Accounting and Behavioural Finance	3	1	0	4
	Economics	EC42001	Economics of Gender	3	1	0	4
	Sociology	SO42001	Perspectives in Indian Sociology	3	1	0	4
			Total				20

SEMESTER-VII (Double Major)

(Without Research/ With Research)

Course Category		Course Code	Course Title	Credit Hours (Weekly)			Total Credit
				L	T	P	
Core Course (Major)		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
		GO 40007	Geoinformatics (Practical)	2	0	4	4
Minor /Double Major Choose any one or any other course	Management	MC42001	Mental Accounting and Behavioural Finance	3	1	0	4
		MC42003	Performance Management	3	1	0	4

from Arts or Science stream offered by University) This may be opted by another Department	Economics	EC42001	Economics of Gender	3	1	0	4
		EC42003	New Institutional Economics	3	1	0	4
	Sociology	SO42003	Sociology of Entrepreneurship	3	1	0	4
			Total				24

SEMESTER-VIII (Single Major)
(Without Research)

Course Category		**Course Code**	**Course Title**	**Credit Hours (Weekly)**			**Total Credit**
				L	**T**	**P**	
Core Course (Major)		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
Minor (Any One among Three)	Management	MC42002	Sustainable Finance and Investment	3	1	0	4
	Economics	EC42002	Basics of Law and Labour Economics	3	1	0	4
	Sociology	SO42002	Rural Sociology and Rural Development	3	1	0	4
			Total				**20**

SEMESTER-VIII (Double Major)
(Without Research)

Course Category	Course Code	Course Title	Credit Hours (Weekly)			Total Credit
			L	T	P	
Core Course (Major)	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
Minor (Any One among Three or any other course from Arts or Science stream offered by University This may be opted by another Department	Management	MC42002	Sustainable Finance and Investment	3	1	0	4
		MC42004	Human Resource Planning	3	1	0	4
	Economics	EC42002	Basics of Law and Labour Economics	3	1	0	4
		EC42004	Financial Economics	3	1	0	4
	Sociology	SO42002	Rural Sociology and Rural Development	4	0	0	4
		SO42004	Sociology of Environment	4	0	0	4
			Total				**24**

SEMESTER-VIII (Single Major)
(With Research)

Course Category		Course Code	Course Title	Credit Hours (Weekly)			Total Credit
				L	T	P	
Core Course (Major)		GO40002	Application in Remote Sensing and GIS	3	1	0	4
Minor (Any One among Three)	Management	MC42002	Sustainable Finance and Investment	3	1	0	4
	Economics	EC42002	Basics of Law and Labour Economics	3	1	0	4
	Sociology	SO42002	Rural Sociology and Rural Development	3	1	0	4
Research		RD40082	Research and Dissertation	0	0	12	12
			Total				20

SEMESTER-VIII (Double Major)

(With Research)

Course Category		Course Code	Course Title	Credits			Total Credits
				L	T	P	
Core Course (Major)		GO40002	Application of Remote Sensing and GIS	3	1	0	4
Minor (Any One among Three)	Sociology	SO42002	Rural Sociology and Rural Development	3	1	0	4
		SO42004	Sociology	3	1	0	4
	Economics	EC42002	Basics of Law and Labour Economics	3	1	0	4
		EC42004	Financial Economics	3	1	0	4
	Management	MC42002	Sustainable Finance and Investment	3	1	0	4
		MC42004	Human Resource Planning	3	1	0	4
Research		RD40082	Research and Dissertation	0	0	12	12
			Total				24

Grand Total: Single Major-162 Credits, Double Major-194 Credits

Exit Point: Bachelor's Degree with Hons. and Research
Students will be awarded UG Degree (Honours) with Research in the relevant Discipline /Subject provided they secure 160 credits. Honours students not undertaking research will do 3 courses for 12 credits in lieu of a research project / Dissertation. Grand Total: Single Major-162 Credits , Double
Major-194 Credits

Course Category Minor for other Discipline students

Semester	Single Major/Double Major	Code	Subject Name
I		GO12001	Fundamental of Geomorphology
II		GO12002	Fundamental of Human Geography
III		GO22001	Climate Science
IV		GO22002	Geographical Thought
V	Single Major	GO32001	Regional Geography of India
	Double Major	GO32001	Regional Geography of India
		GO32003	Demographic Geography
		GO32005	Fundamental of Statistics
		GO32007	Tourism Geography
V I	Single Major	GO32002	Vulnerability and Risk Management
	Double Major	GO32002	Vulnerability and Risk Management
		GO32004	Urban Studies
		GO32006	Geography of Agriculture
		GO32008	Cartographic Techniques
VII	Single Major	GO42001	Tribal Demography of Odisha
	Double Major	GO42001	Tribal Demography of Odisha
		GO42003	Environment and Sustainability
VIII	Single Major	GO42002	Fundamentals of Remote Sensing and GIS
	Double Major	GO42002	Fundamentals of Remote Sensing and GIS
		GO42004	Natural Resources and Sustainable Management

Course Structure (Semester-wise)

Semester I

Code	Course Title	Credit	L-T-P
GO10001	Principles of Geomorphology	4	3-0-1

Course Learning Objectives:

The objective of the course is to study of different kinds of landforms on the surface of the earth. This course design makes students' friendly to meet the new demands challenges for planning and development. It attempts to distil the key areas like earth's movement and different geomorphic processes which have been arranged in the course in hierarchical order. It also explains the origin of different landforms and rate of change in the shape of these landforms. The course focuses on the evolution and development of river valleys. Emphasis is given to applied geomorphology which includes land slide prediction and mitigation, river control and stream restoration and coastal protection.

Upon successful completion of this course, students will be able to:

- **CO 1** Remember the concept, recent trends of Geomorphology and Earth movements
- **CO 2** Understand the physical principles of common geomorphic processes Geomorphic Cycle and evolution of landforms
- **CO 3** Apply in geomorphology and hydrology in managing and planning the land use and the environment
- **CO 4** Analyze the types and characteristics of common land forms, Earth's folds and faults
- **CO 5** Create awareness to reduce Geomorphic Hazards in their locality

CO-PO-PSO Mapping

Program Outcomes → / Course 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
CO1	3	2	–	–	–	–	2	1	–	–	1	1	3	2	–	–	–
CO2	3	3	–	2	–	–	–	1	1	–	1	1	3	2	–	1	–
CO3	3	3	2	2	1	–	2	2	1	–	1	1	3	3	–	2	1
CO4	3	3	2	3	2	–	3	2	2	1	2	3	3	3	2	2	2
CO5	3	3	3	3	2	–	3	2	2	1	2	3	3	3	2	2	3
Average	3	2.8	1.4	2	1	–	2	1.6	1.2	0.4	1.4	1.8	3	2.6	0.8	1.4	1.2
Mapping Scale:																	

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

Course Inputs:

Unit I: Introduction to Geomorphology

Nature, scope, significance, and fundamental concepts of geomorphology; origin and evolution of the Earth; internal structure of the Earth; Continental Drift Theory; Plate Tectonics; major lithospheric plates; and the evolution of the Earth's crust and major landforms.

Unit II: Earth's Interior, Isostasy, and Rocks

Structure and composition of the Earth's interior; concept and theories of isostasy (Airy's and Pratt's views); minerals and the rock cycle; classification, characteristics, and formation of igneous, sedimentary, and metamorphic rocks.

Unit III: Earth Movements and Tectonic Landforms

Plate tectonics and crustal deformation; endogenetic earth movements; folding and faulting and their types and characteristics; earthquakes and volcanoes and their causes, types, distribution, and associated landforms.

Unit IV: Geomorphic Processes

Endogenetic and exogenetic forces; weathering (physical, chemical, and biological); mass wasting; denudation; soil formation and regolith development; geomorphic processes responsible for landscape evolution.

Unit V: Landform Evolution

Processes of erosion and deposition; evolution and characteristics of fluvial, karst, aeolian, glacial, and coastal landforms; geomorphic significance of erosional and depositional features**.**

Text Book Recommended:

1. Strahler, A.W. (2016), Introducing Physical Geography, Wiley India Pvt. Ltd

2. Singh, Savindra (2020), Physical Geography *Paperback*, Pravalika Publications

3. Hussain, M. (1994), Geomorphology, Anmol Publications Pvt. Limited

4. Thornbury, W.D. (2018), Principle of Geomorphology, New Age International

5. Singh, S (2009): Bhautik Bhugol Ka Swaroop, Prayag Pustak, Allahabad

References:

1. Singh,L.R. Fundamentals of Practical Geography**,**

1. Hussain, M. (2009), Fundamentals of Physical Geography, Rawat Publication Fourth Edition.

2. Singh, S., Geomorphology, Prayag Pustak Bhawan, Allahabad.

3. Strahler, A.N. and Stahler, A.M. (1992) Modern Physical Geography, John Wiley and Sons, New York.

4. Bloom, A. L., (2003), Geomorphology–A Systematic Analysis of Late Cenozoic Land forms, Prentice-Hall of India, New Delhi.

5. Thornbury, W. D. (1990), Principles of Geomorphology, Wiley Eastern Edition, New York.

6. Gautam, A(2010): Bhautik Bhugol, Rastogi Publication, Meerut.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Knowledge of physical environment and earth systems
SDG 11	Sustainable Cities & Communities	Understanding natural hazards and landform planning
SDG 13	Climate Action	Study of geomorphic processes and climate impact
SDG 15	Life on Land	Land degradation, soil erosion, ecosystem protection

Course Category Minor for other Discipline students

Code	Course Title	Credit	L-T-P
GO12001	Fundamental of Geomorphology	4	3-1-0

Course Learning Objectives: This course aims to provide students with an understanding of Earth's landforms, geomorphic processes, and landscape evolution. It covers the origin and development of major landforms, with special emphasis on river valleys and applied geomorphology, including landslide mitigation, river management, and coastal protection.

Upon successful completion of this course, students will be able to:

CO 1 Learn the understanding of the fundamental principles and concepts of geography.

CO 2 Understand the physical and human processes that shape the Earth's landscape, environment and places

CO 3 Evaluate the complex interplay between physical and human geography

CO 4 To Identify the geographic data and apply geographic perspectives to real-world issues

CO 5 Analyse the fundamental geomorphological concepts to interpret landforms and assess their relevance in environmental management and resource planning

Program Outcomes → / **Course 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**
CO1	3	2	–	–	–	–	2	1	–	–	1	1	3	2	–	–	–
CO2	3	3	–	2	–	–	–	1	1	–	1	1	3	2	–	1	–
CO3	3	3	2	2	1	–	2	2	1	–	1	1	3	3	–	2	1
CO4	3	3	2	3	2	–	3	2	2	1	2	3	3	3	2	2	2
CO5	3	3	3	3	2	–	3	2	2	1	2	3	3	3	2	2	3
Average	3	2.8	1.4	2	1	–	2	1.6	1.2	0.4	1.4	1.8	3	2.6	0.8	1.4	1.2

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

Course Inputs:

Unit I: Fundamentals of Geomorphology

Definition, nature, scope, significance, and basic concepts of geomorphology; origin and age of the earth; internal structure of the earth; major geomorphic agents and processes.

Unit II: Unit II: Earth Materials

Earth materials; minerals and their physical properties; rocks types and characteristics of igneous, sedimentary, and metamorphic rocks; introduction to Continental Drift Theory and Plate Tectonic Theory**.**

Unit III: Endogenetic Processes and Landform Development

Earth movements; endogenetic forces; folding and faulting; earthquakes and seismicity; volcanism; tectonic landforms; evolution of geomorphic thought and theories of landscape development.

Unit IV: Exogenetic Processes

Weathering (physical, chemical, and biological); mass wasting; denudation; erosion, transportation, and deposition; soil formation.

Unit V: Major Landforms

Origin, evolution, and characteristics of erosional and depositional landforms produced by fluvial, karst, aeolian, glacial, and coastal geomorphic processes

Text Book Recommended:

1. Strahler, A.W. (2016), Introducing Physical Geography, Wiley India Pvt. Ltd

2. Singh, Savindra (2020), Physical Geography *Paperback*, Pravalika Publications

3. Hussain, M. (1994), Geomorphology, Anmol Publications Pvt. Limited

4. Thornbury, W.D. (2018), Principle of Geomorphology, New Age International

5. Singh, S (2009): Bhautik Bhugol Ka Swaroop, Prayag Pustak, Allahabad

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1. Singh,L.R. Fundamentals of Practical Geography**,**

1. Hussain, M. (2009), Fundamentals of Physical Geography, Rawat Publication Fourth Edition.

2. Singh, S., Geomorphology, Prayag Pustak Bhawan, Allahabad.

3. Strahler, A.N. and Stahler, A.M. (1992) Modern Physical Geography, John Wiley and Sons, New York.

4. Bloom, A. L., (2003), Geomorphology–A Systematic Analysis of Late Cenozoic Land forms, Prentice-Hall of India, New Delhi.

5. Thornbury, W. D. (1990), Principles of Geomorphology, Wiley Eastern Edition, New York.

6. Gautam, A(2010): Bhautik Bhugol, Rastogi Publication, Meerut.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Knowledge of physical environment and earth systems
SDG 11	Sustainable Cities & Communities	Understanding natural hazards and landform planning
SDG 13	Climate Action	Study of geomorphic processes and climate impact
SDG 15	Life on Land	Land degradation, soil erosion, ecosystem protection

Code	Course Title	Credit	L-T-P
CC13001	**Financial Literacy**	**3**	**2-1-0**

Course Objectives:

This course aims to provide students with essential knowledge and skills to effectively manage personal finances, make informed financial decisions, and plan for their financial future. Topics covered include budgeting, saving, investing, managing debt, understanding credit, and basic principles of financial planning.

Course Outcomes:

CO1-Understand the importance of financial literacy in personal and professional life.

CO2- Learn about credit scores, credit reports, and how credit works.

CO3- Learn strategies for saving and investing money.

CO4-Explore basic principles of financial tax planning for short-term and long-termgoals.

CO5-Understand the different types of debt and strategies for managing debt responsibly.

CO–PO-PSO Mapping

3 = High, 2 = Medium, 1 = Low, – = No correlation

COs \ POs & PSOs	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
CO 1	3	2	1	1	2	2	1	2	2	2	1	2	3	2	1	2	1
CO 2	3	3	2	2	2	2	1	2	2	2	2	2	3	3	2	2	1
CO 3	3	3	3	2	3	2	1	2	2	3	2	3	3	3	3	2	2
CO 4	3	3	2	2	2	3	2	3	2	2	2	3	3	3	3	3	2
CO 5	3	3	3	3	2	3	2	3	3	3	3	3	3	3	3	3	3

Course Inputs:

Unit-I: Financial Planning and Financial Products: Introduction to Saving, Time value of money, Management of spending and financial Discipline

Unit-II: Banking and Digital Payment: Banking product and services, Digitization of financial transactions: Debit cards (ATM cards) and Credit Cards, Net banking and UPI, Digital wallets, Security and Precautions against Ponzi Schemes and online frauds

Unit-III: Investment Planning and management: Investment opportunity and financial products, Insurance Planning, life and non-life including medical insurance schemes

Unit-IV: Personal Tax: Introduction to basic tax structure in India for personal taxation, Aspects of Personal Tax planning, Exemptions and deductions for individuals-filling.

Unit-V: Managing Debt: Types of debt (e.g., credit cards, student loans, mortgages) Strategies for managing debt, Understanding interest rates and how they affect debt

Recommended Learning Resources

Textbooks:

1.Textbook: "Personal Finance for Dummies" by Eric Tyson

2.Online resources: Khan Academy, Investopedia, NerdWallet

3.Guest speakers: Financial planners, bankers, or representatives from local credit unions

4.Financial Literacy: Prof.(Dr.) Amit Kumar Singh,Taxmann's Publication

SDG Mapping with SDG Title and Contribution:

SDG No.	SDG Title	Contribution of the Course
SDG 1	No Poverty	Promotes financial inclusion, savings, and better financial management for economic security.
SDG 4	Quality Education	Enhances financial awareness, practical literacy, and informed decision-making.
SDG 5	Gender Equality	Encourages women's financial literacy and equitable financial participation.
SDG 8	Decent Work and Economic Growth	Supports informed financial planning, savings, and productive economic participation.
SDG 10	Reduced Inequalities	Promotes inclusive access to financial knowledge and services.
SDG 12	Responsible Consumption and Production	Encourages responsible spending, saving, and consumption behaviour.
SDG 16	Peace, Justice and Strong Institutions	Strengthens financial awareness, transparency, and responsible financial conduct.

Ability Enhancement Course (AEC)
AE14001(Odia), AE14003(Hindi), AE14005(Sanskrit), AE14007(Santali), AE14009(English)
Refers to the Subject Department

Code	Course Title	Credit	L-T-P
SK15001	**Statistics for Social Sciences**	**3**	**2-0-1**

Course Learning Objectives

This course aims to introduce students to the basic concepts of statistics and their applications in social science research. It enables students to understand the nature and sources of data, organize and present data systematically, and apply fundamental statistical techniques such as measures of central tendency, dispersion, correlation, and sampling for analysis and interpretation of social phenomena.

Course Learning Outcomes

On successful completion of this course, students shall be able to:

CO1: Remember the basic concepts, types, sources and measurement scales of social science data.

CO2: Understand methods of data classification, tabulation, presentation and descriptive statistics.

CO3: Apply measures of central tendency, dispersion and sampling techniques to social science data.

CO4: Analyse relationships among social variables using correlation and regression techniques.

CO5: Evaluate the use of statistical methods in social science research and evidence-based decision making.

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	–	–
CO2	3	3	2	2	1	–	2	1	1	–	2	1	3	3	2	1	1
CO3	3	3	2	3	2	1	2	2	1	1	2	2	3	3	2	2	2
CO4	3	3	3	3	2	1	2	2	2	1	3	2	3	3	3	2	2
CO5	3	3	3	3	3	2	3	2	2	1	3	3	3	3	3	3	3
Average	3	2.8	2.2	2.4	1.6	0.8	2	1.6	1.2	0.6	2.2	1.8	3	2.8	2.2	1.6	1.6
Mapping Scale:																	
1 – Low (Weakly Mapped)							3 – High (Strongly Mapped)										
2 – Medium (Moderately Mapped)							"–" No Correlation										

Course Inputs

UNIT-I Conceptual Framework of Statistics

Meaning, Functions, Scope, Importance and limitations of Statistics, Sources of Statistical data-Primary data and secondary data, Methods of primary data collection.

UNIT-II Frequency Distribution

Organization of Data, Presentation of data-Tabular and diagrammatic Presentation, Bar-diagram, Pie diagram, Histogram, Frequency polygon, Ogives.

UNIT-III Sampling Methods

Census and Sampling methods and their relative merits & demerits, Partial and Complete enumeration.

UNIT-IV Statistical Methods

Measures of Central tendency: Arithmetic Mean, median and mode. Harmonic mean and Geometric mean.

UNIT- V Measures of Dispersion

Absolute Measures: Range, Quartile deviation, Mean deviation and Standard deviation. Relative Measures-Coefficient of Range, Quartile deviation, Mean deviation and Standard deviation.

Recommended Learning Resources

Textbooks:

1. F. S. Mishkin and S. G. Eakins, Financial Markets and Institutions, Pearson

Education, 6th edition, 2009.

2. F. J. Fabozzi, F. Modigliani, F. J. Jones, M. G. Ferri, Foundations of Financial

Markets and Institutions, Pearson Education, 3rd edition, 2009.

3. M. R. Baye and D. W. Jansen, Money, Banking and Financial Markets, AITBS, 1996.

Suggested readings

Rakesh Mohan, Growth with Financial Stability- Central Banking in an Emerging

Market, Oxford University Press, 2011.

https://youtu.be/NCIb69nO8MM

Notes: Latest Edition of the textbook should be used.

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Develops statistical literacy, analytical skills and research competence.
SDG 5	Gender Equality	Supports analysis of gender-related social and economic indicators.
SDG 9	Industry, Innovation and Infrastructure	Promotes the application of statistical methods in research, innovation, technological development, and infrastructure planning.
SDG 11	Sustainable Cities and Communities	Supports the analysis and interpretation of demographic, environmental, and urban data for sustainable planning and resource management
SDG 17	Partnerships for the Goals	Promotes data-driven planning, monitoring and policy formulation.

Course Code	Course Title	Total Credit	L-T-P
VA16201	**Environment Education and Disaster Management**	**4**	**3-0-1**

Course Objectives: The objective is to make students aware about the environmental functions and issues.

Course Learning Outcomes:

CO1: Students will develop a comprehensive understanding of the complex interactions between humans and the environment, tracing historical developments, analyzing contemporary challenges, and exploring sustainable solutions.

CO2: Students will be able to critically analyze the impact of human activities on natural resources, biodiversity, ecosystems, and the climate, evaluating the effectiveness of conservation efforts and mitigation strategies.

CO3: Students will gain an interdisciplinary perspective by integrating knowledge from fields such as ecology, geography, sociology, economics, and policy studies to address environmental issues holistically.

CO4: Students will cultivate problem-solving skills by applying scientific principles, analytical tools, and ethical considerations to devise innovative solutions for environmental challenges at local, regional, and global scales.

CO5: Students will develop the capacity for active engagement and advocacy in environmental stewardship, recognizing their role as responsible global citizens and agents of positive change in promoting sustainability and resilience.

COs \ POs/PSOs	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
CO1	3	3	2	1	3	1	1	2	1	1	1	2	3	2	1	1
CO2	3	3	3	2	3	1	1	2	2	1	2	2	3	3	2	2
CO3	3	2	2	2	2	2	1	2	2	1	1	2	3	2	2	2
CO4	3	3	3	3	2	1	1	2	2	2	3	2	3	3	3	2
CO5	3	2	2	1	2	2	3	3	2	3	1	3	2	2	1	
Average	**3**	**2.6**	**2.4**	**1.8**	**2.4**	**1.4**	**1.4**	**2.2**	**1.8**	**1.6**	**1.6**	**2.2**	**2.8**	**2.4**	**1.8**	**1.8**

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

Course Inputs:

Unit I: Humans and the Environment

The man-environment interactions: Human as hunger-gatherers; Origin of agriculture; Great ancient civilizations and the environment; Industrial revolution and its impact on the environment; Population growth and natural resource exploitation; Concept of sustainable development, Sustainable Development Goals (SDGs).

Unit II: Natural Resources and Sustainable Development

Overview of natural resources, renewable and non-renewable resources. Biotic resources: Major type of biotic resources-forests, grassland, wetlands, wildlife. Water resources: Types of water resources-fresh water and marine; Availability and use of water resources; Environmental impact of over-exploitation, issues and challenges; Conflicts over water. Soil and mineral

resources: Energy resources: Renewable and non-renewable sources of energy; non-conventional energy sources-solar, wind, tidal, hydro, geothermal, biomass, hydrogen and fuel cells; Implications of energy use on the environment.

Unit III: Conservation of Biodiversity and Ecosystems

Biodiversity as a natural resource; Biodiversity in India and the world; Biodiversity hotspots; Endangered species, Red data book. Threats to biodiversity and ecosystems: Commercial exploitation of species; Invasive species. Major conservation policies: in-situ conservation approaches; Major protected areas; National and International initiatives for biodiversity conservation; the role of traditional knowledge, community-based conservation. Land use and Land cover change: deforestation, desertification, urbanization, Loss of Biodiversity and it's impact.

Unit IV: Environmental Pollution

Environmental issues at local, regional, and global levels. Air, noise, water, soil, thermal and radioactive pollution. Point sources and non-point sources of pollution.

Air pollution: Sources of air pollution; Primary and secondary pollutants; particulate matter and sulphur dioxide; Volatile Organic compounds (VOCs), Polycyclic aromatic hydrocarbons (PAHs) and Persistent organic pollutants (POPs); acid rain; smog, Ozone hole. National Ambient Air Quality Standards.

Water pollution: Sources of water pollution; River, lake and marine pollution, groundwater pollution; water quality, Water quality parameters and standards; adverse health impacts of water pollution on human and aquatic life.

Soil pollution: Soil pollutants and their sources; Solid waste and their recycling. Noise pollution: Definition of noise; Unit of measurement of noise pollution; Mineral exploitation; Environmental problems due to extraction of minerals and use; Degradation of soil quality and impact on agriculture productivity.

Noise pollution; Noise standards; adverse impact of noise on human health.

Thermal and Radioactive pollution: Sources and impact on human health and ecosystems.

Unit V : Climate Change: Impacts, Adaptation and Mitigation

Understanding climate change, Projections of global climate change with reference to temperature, rainfall, climate variability and extreme events; Climate change projections for the Indian sub-continent.

Impacts of climate change on ocean and land systems; Sea level rise, changes in marine and costal ecosystems; Impacts on forests and natural ecosystem; Impacts on animal species, agriculture, health, urban infrastructure; Climate-resilient development; Indigenous knowledge for adaption to climate change.

Mitigation of climate change: Green House Gas (GHG) Reduction vs. sink enhancement; Concept of carbon intensity, energy intensity and carbon neutrality; Energy efficiency measures; Renewable energy sources; Carbon capture and storage.

Unit VI: Environmental Management

Introduction to environmental laws and regulations: Constitutional provisions- Article 48A, Article 51A (g) and other environmental rights, Environmental legislations on the forest, wildlife and pollution control. Environmental audit and impact assessment; Waste Management- Concept of 3R (Reduce, Recycle and Recycle) and sustainability.

Unit VII: Environmental Treaties and Legislation

Major International Environmental Agreements: UN Conference on Human Environment 1972, Convention on Biological Diversity (CBD); Cartagena Protocol on Biosafety; Nagoya Protocol on Access and Benefit-sharing ; Convention on International Trade in Endangered Species of Wild Flora and Fauna(CITES); Ramsar Convention on Wetlands of International Importance; United Nations Convention to Combat Desertification (UNCCD); Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol on Substances that Deplete the Ozone Layer and the Kigali Amendment; Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal; Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; Stockholm Convention on Persistent Organic Pollutants; Minamata Convention on Mercury; United Nations Framework Convention on Climate Change (UNFCCC); Kyoto Protocol; Paris Agreement; India's status as a party to major conventions

Major Indian Environmental Legislations: The Wild Life (Protection) Act, 1972; The Water (Prevention and Control of Pollution) Act, 1974; The Forest (Conservation) Act, 1980; The Air(Prevention and Control of Pollution) Act, 1981 The Environment (Protection) Act, 1986; The Biological Diversity Act, 2002; The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Noise Pollution (Regulation and Control) Rules, 2000; Industry-specific environmental standards; Waste management rules, National Green Tribunal.

Major International organizations and initiatives: United Nations Environment Programme(UNEP), International Union for Conservation of Nature (IUCN), World Commission on Environment and Development (WCED), United Nations Educational, Scientific and Cultural Organization (UNESCO), Intergovernmental Panel on Climate Change (IPCC), and Man and the Biosphere(MAB) programme.

Unit VIII: Disaster Management

Concept of Hazards, Disasters, Natural and man-made hazards, Types of hazards, Concept of disaster management, Vulnerability and risk. Nature and characteristics of hazards: Flood, Cyclone, Drought, and Earthquake. Man made hazards – Industrial and Fire.

Disaster management cycle, Pre disaster management, during disaster management, Post Disaster review and management, Preventing, mitigation, preparedness, Adaptation. Disaster Management Plan at National Level, State Level, District Level and Community Level.

Practical:

1. Environment and its analysis
2 Water quality parameters
3 Determination of pH of water samples

4 Determination of acidity of water
5 Determination of Alkalinity of water sample
6 Measurement of turbidity of water samples
7 Determination of conductivity of water sample
8 Estimation of dissolved Oxygen (DO) in water sample
9 Estimation of Biological Oxygen Demand (BOD) of water
10 Estimation of Chemical Oxygen Demand (COD) of water
11 Determination of chloride in water
12 Determination of calcium hardness of water
13 Determination of total hardness of water
14 Determination of minerals in water
15 Visit to Industrial Sewage Disposal Unit

Recommended Learning Resources:

Textbooks

1. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
2. Das, M.C. Text Book of Ecology, Tata Mc Graw Hills, New Delhi
3. Central Pollution Control Board Web page for various pollution standards. https://cpcb.nic.in/standards/
4. Chiras, D. D and Reganolds, J.P. (2010) . Natural Resource Conservation : Management for a Sustainable Future. 10th edition, Upper Saddle River, N.J. Benjamin/Cummins/Person.
5. Fisher, Michael H. (2018) An Environmental History of India-Form Earliest Times to the Twenty-First Century, Cambridge University Press.
6. Harris, France (2012) Global Environmental Issues, 2nd Edition. Wiley-Blackwell.
7. John W. Twidell and Anthony D. (2015). Renewable Energy Sources, 3rd Edition, Weir Publisher (ELBS)
8. Kanchi Kohli and Manju Menon (2021) Development of Environment Laws in India, Cambridge University Press.

Reference Material & Digital Resources

1. Krishnamurthy, K.V.(2003) Textbook of Biodiversity, Science Publishers, Plymouth, UK
2. Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes.
3. https://moef.govt.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf

4. Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press.

5. Annual Reports of Ministry of Env., Forests and Climate Change, Govt of India, New Delhi

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

SDG Mapping

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Builds environmental awareness, interdisciplinary knowledge, and sustainability skills
SDG 6	Clean Water and Sanitation	Addresses water resources, pollution, and conservation
SDG 7	Affordable and Clean Energy	Promotes renewable energy and energy efficiency
SDG 11	Sustainable Cities and Communities	Focus on urbanization, disaster management, and environmental planning
SDG 12	Responsible Consumption and Production	Encourages sustainable resource use and waste management (3R principles)
SDG 13	Climate Action	Covers climate change impacts, mitigation, and adaptation strategies
SDG 14	Life Below Water	Addresses marine ecosystems and water pollution
SDG 15	Life on Land	Focus on biodiversity conservation, forests, and land degradation
SDG 16	Peace, Justice and Strong Institutions	Covers environmental laws, policies, and governance frameworks

SEMESTER-II

Code	Course Title	Credit	L-T-P
GO10002	**Human Geography**	**4**	**3-1-0**

Course Learning Objectives:

The objectives of this course are to acquaint the students with the nature of man-environment relationship and human capability to adopt and modify the environment under its varied conditions from primitive life style to the modern living; to identify and understand environment and population in terms of their quality and spatial distribution pattern and to comprehend the contemporary issues facing the global community.

Course Learning Outcomes:

On successful completion of this course the students shall enable to:
CO1: Remember the Nature and Scope of Human Geography
CO2: Understand the Human Activities in Geography
CO3: Apply the knowledge of demographical changes.
CO4: Analyze the Population dimensions in their day-to-day life.
CO5: Evaluate the settlement pattern of Rural and towns.

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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	–	–	–
CO2	3	3	1	2	–	1	1	2	1	–	1	1	3	2	–	1	–
CO3	2	3	2	2	1	1	2	2	1	1	2	2	3	3	1	2	1
CO4	2	3	3	3	1	2	2	2	2	1	2	2	3	3	2	2	1
CO5	2	2	3	3	2	2	2	2	2	1	2	2	3	3	2	2	2
Average	2.4	2.6	1.8	2	0.8	1.2	1.6	1.8	1.2	0.6	1.6	1.6	3	2.6	1	1.4	0.8
Mapping Scale:																	
1 – Low (Weakly Mapped)								3 – High (Strongly Mapped)									
2 – Medium (Moderately Mapped)								"–" No Correlation									

Course Inputs:

UNIT–I: Introduction to Human Geography

Nature, scope, significance, and development of Human Geography; branches and approaches of Human Geography; man–environment relationship; environmental determinism, possibilism, neo-determinism, and probabilism.

UNIT–II: Human Settlements

Human Settlements: types and patterns, factors influencing the growth of settlements, definition and classification of urban settlements, Evolution of Human; Classification of races; Characteristics of races and their broad distribution

UNIT–III: Population Geography

Population: factors affecting population distribution, population growth and distribution, population composition, and population theories (Malthus and Demographic Transition Theory).

UNIT–IV: Human Settlement

Concept and significance of human settlements; origin and evolution of settlements; Types of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of Urbanization, concept of smart cities, rural transformation.

UNIT–V: Contemporary Issues in Human Geography

Urbanization; globalization; human and environment interaction; sustainable development; environmental challenges; regional disparities and quality of life.

Text Book Recommended:

Hussain, M. (2021) Human Geography (2021), Rawat Publications

Suggested Readings:

1. Bergwan, E. E. (1995), Human Geography; Culture, Connections and Landscape, Prentice-Hall, New Jersey
2. Carr, M., (1987), Patterns, Process and change in Human Geography. MacMillan Education, London
3. Johnston, R.J. (editor) (1994), Dictionary of Human Geography Blackwell, Oxford ,https://youtu.be/hXv7r8HqKKE

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Understanding human-environment interaction and population studies
SDG 11	Sustainable Cities & Communities	Knowledge of settlement planning and urbanization trends
SDG 13	Climate Action	Population pressure and urban impact on climate

SDG 15	Life on Land	Human impact on land use and environmental sustainability

Course Category Minor for other Discipline students

Code	Course Title	Credit	L-T-P
GO12002	Fundamental of Human Geography	4	3-1-0

Course Learning Objectives

This course aims to introduce the fundamental concepts and principles of Human Geography. It enables students to understand human–environment relationships, population and settlement patterns, cultural and economic activities, and contemporary issues related to sustainable development.

Course Learning Outcomes:

On successful completion of this course the students shall enable to:
CO1: Remember the Nature and Scope of Human Geography
CO2: Understand the Human Activities in Geography
CO3: Apply the knowledge of demographical changes.
CO4: Analyze the Population dimensions in their day-to-day life.
CO5: Evaluate the settlement pattern of Rural and towns.

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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	–	–	–
CO2	3	3	1	2	–	1	1	2	1	–	1	1	3	2	–	1	–
CO3	2	3	2	2	1	1	2	2	1	1	2	2	3	3	1	2	1
CO4	2	3	3	3	1	2	2	2	2	1	2	2	3	3	2	2	1
CO5	2	2	3	3	2	2	2	2	2	1	2	2	3	3	2	2	2
Average	2.4	2.6	1.8	2	0.8	1.2	1.6	1.8	1.2	0.6	1.6	1.6	3	2.6	1	1.4	0.8
Mapping Scale:																	
1 – Low (Weakly Mapped)									3 – High (Strongly Mapped)								
2 – Medium (Moderately Mapped)									"–" No Correlation								

Course Inputs

Unit I: Introduction to Human Geography

Nature, scope, significance, and concepts of Human Geography; branches of Human Geography; approaches to the study of Human Geography; man–environment relationship.

Unit II: Population and Human Settlements

Population distribution, density, and growth; factors affecting population distribution; population composition; rural and urban settlements; types, patterns, and functions of settlements.

Unit III: Culture and Society

Concept of culture; cultural landscapes; language, religion, ethnicity, and race; cultural regions; cultural diffusion and human adaptation.

Unit IV: Human Economic Activities

Classification of economic activities; primary, secondary, tertiary, quaternary, and quinary activities; agriculture, industry, transport, trade, and services; resources and human development.

Unit V: Human–Environment Interaction

Human adaptation and modification of the environment; environmental issues and sustainable development; globalization and its impact on society and culture; contemporary issues in Human Geography.

Text Book Recommended:
Hussain, M. (2021) Human Geography (2021), Rawat Publications

Suggested Readings:

1. Bergwan, E. E. (1995), Human Geography; Culture, Connections and Landscape, Prentice-Hall, New Jersey
2. Carr, M., (1987), Patterns, Process and change in Human Geography. MacMillan Education, London
3. Johnston, R.J. (editor) (1994), Dictionary of Human Geography Blackwell, Oxford ,https://youtu.be/hXv7r8HqKKE

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Understanding human-environment interaction and population studies

SDG 11	Sustainable Cities & Communities	Knowledge of settlement planning and urbanization trends
SDG 13	Climate Action	Population pressure and urban impact on climate
SDG 15	Life on Land	Human impact on land use and environmental sustainability

Code	Course Title	Credit	L-T-P
CS13002	Data Analytics	4	3-0-1

Course Objectives:

Upon successful completion of this course, students will be able to apply data analytics techniques to solve real-world problems, critically analyse data, and communicate their findings effectively.

Course Outcomes:

Upon successful completion of this course, students will be able to:

- **CO1 (Knowledge/Remember):** Recall and describe the fundamental concepts of data analytics, data types, data collection methods, data preprocessing, statistical analysis, and analytical workflows.
- **CO2 (Understanding):** Explain and interpret the principles of exploratory data analysis, statistical techniques, data visualization, hypothesis testing, and data quality assessment.
- **CO3 (Application):** Apply statistical methods, computational tools, programming libraries, and data analytics techniques to collect, preprocess, analyze, and visualize data for solving real-world problems.
- **CO4 (Analysis):** Analyze and compare data analysis methods, predictive models, visualization techniques, and analytical tools to identify meaningful patterns, trends, and insights for evidence-based decision-making.
- **CO5 (Synthesis/Evaluation):** Design, implement, and evaluate comprehensive data analytics solutions by integrating statistical analysis, visualization techniques, ethical data practices, and effective communication to present actionable insights through reports and presentations.

CO-PO-PSO Mapping

*(Rate correlations: **1** - Weakly Mapped, **2** - Moderately Mapped, **3** - Strongly Mapped, **"_"** - No Correlation).*

CO	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	PSO 2	PSO 3	PSO 4
CO1	3	3	-	-	-	-	-	-	-	-	-	-	2	-	2	2
CO2	-	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-
CO3	-	-	-	3	2	-	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	3	-	-	-	-	-	-	2	2	2	-
CO5	-	-	3	-	-	-	-	-	-	-	-	-	2	-	-	2

Course Inputs

UNIT I: Introduction to Data Analytics [10 Classroom Contact Hours]

Overview of data analytics, its importance, and applications, Data types (structured, unstructured) and data sources, Data preprocessing: cleaning, transformation, and normalization, Introduction to Python/R for data analysis

UNIT II: Descriptive Analytics [11 Classroom Contact Hours]

Summary statistics: mean, median, variance, etc., Data visualization: histograms, scatter plots, box plots, Exploratory data analysis (EDA), Case study: analysing a real-world dataset

UNIT III: Predictive Analytics [12 Classroom Contact Hours]

Regression analysis: linear regression, multiple regression, Classification: logistic regression, decision trees, k-nearest neighbours, Model evaluation and validation, Hands-on exercises using scikit-learn or similar libraries.

UNIT IV: Prescriptive Analytics [12 Classroom Contact Hours]

Optimization techniques: linear programming, integer programming, Decision support systems, Case study: optimization in supply chain management

UNIT IV: Advanced Topics in Data Analytics [10 Classroom Contact Hours]

Time series analysis, Clustering techniques: k-means, hierarchical clustering, Text mining and sentiment analysis, Ethical considerations in data analytics

- **Textbook:**

1. "Data Science for Business" by Foster Provost and Tom Fawcett

- **Reference Books:**
  1. "Python for Data Analysis" by Wes McKinney
  2. "Introduction to Statistical Learning" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani

SDG Mapping for this Course

SDG	Title	Contribution
3	Good Health and Well-being	Health and nutrition data analysis
4	Quality Education	Data literacy across disciplines
9	Industry, Innovation and Infra	Analytics for innovation
10	Reduced Inequalities	Studying disparities (tribal, gender, region)
13	Climate Action	Climate/agri analytics

Code	Course Title	Credit	L-T-P
TR15002	**Professional Readiness and Development**	**3**	**2-1-0**

Course Learning Objectives: To promote skills education in an integrated and holistic manner with general education so as to ensure pathways for progression and mobility across forms of education and skills.

After successful completion of the course, students will be able to:

1. **CO1 (Understand & Analyze):** Interpret contemporary business affairs, current economic trends, and recent corporate developments using real-time data and case studies.
2. **CO2 (Understand & Evaluate):** Examine sustainable business practices including green finance, ESG, circular economy, and SDGs, and assess their relevance in modern business.
3. **CO3 (Apply & Analyze):** Demonstrate practical understanding of banking, digital payments, and financial services, and apply them in personal financial decision-making.
4. **CO4 (Apply & Evaluate):** Apply principles of commerce in real-life contexts such as budgeting, taxation, financial planning, and institutional frameworks.

5. **CO5 (Apply & Create):** Develop employability skills including resume writing, professional communication, interview techniques, and workplace readiness.

CO–PO–PSO Mapping Table

Program Outcomes → / **Course Outcomes ↓**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	3	2	2	3	2	1	2	3	2	2	2	3	2	1	1	1
CO2	3	3	3	2	3	1	1	3	3	1	1	2	3	3	2	1	1
CO3	3	3	3	3	3	2	1	1	2	2	3	2	2	2	3	2	2
CO4	3	3	3	3	3	2	1	2	2	2	2	2	2	2	2	3	2
CO5	2	2	3	2	2	3	3	2	2	3	2	3	2	1	1	2	3
Average	**2.8**	**2.8**	**2.8**	**2.4**	**2.8**	**2**	**1.4**	**2**	**2.4**	**2**	**2**	**2.2**	**2.4**	**2**	**1.8**	**1.8**	**1.8**

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

Course Inputs:

UNIT I: Contemporary Business Affairs and Current Business Landscape

- Understanding contemporary business affairs through newspapers, digital media, and market reports
- Emerging business issues: inflation, sustainability, AI in business, and changing consumer trends

- Recent advances in science and technology (AI, space research by Indian Space Research Organisation)
- Environmental issues and climate change; global initiatives (e.g., United Nations Climate Change Conference)
- Social issues, international relations, and major global organizations like United Nations
- **Case Study:** Analysis of a recent corporate event / startup success / merger case
- **Practical Exposure:** Weekly business news analysis and student presentation

UNIT II: Sustainable Business and Responsible Market Practices

- Introduction to sustainable business and its relevance in the modern economy
- Green finance, Blue Finance, Green Marketing, Orange Economy, GIG Economy. SDGs and business: role of business in achieving sustainable development goals
- Emerging trends: social entrepreneurship, circular economy, carbon market and sustainable supply chains

Case Study: Analysis of a sustainable business / green brand / social enterprise

Practical Exposure: Sustainable product audit and SDG mapping of a business enterprise

UNIT III: Practical Banking and Financial Services

- Banking in daily life: accounts, deposits, loans, and essential banking services
- Digital banking in practice: UPI, mobile banking, online payments, and cyber safety
- Basics of mutual funds, SIP, savings, and investment decision-making
- Financial services in real life: insurance, NBFCs, EMI, loans, and credit score
- **Case Study:** Personal Financial Decision-Making (Savings vs Investment / Loan vs EMI)
- **Practical Exposure:** Banking form filling, digital payment demo, and financial product comparison

UNIT IV: Commerce in Practice and Financial Decision-Making

- Commerce in everyday transactions: GST, invoices, e-commerce, and digital payments
- Personal financial planning, Financial products in daily life

- Role of institutions in commerce: SEBI, RBI, LIC, NABARD, SIDBI, and financial inclusion schemes
- **Case Study:** Personal Budgeting and Financial Planning Exercise
- **Practical Exposure:** Bill analysis, budgeting workshop, and financial decision simulation

UNIT V: Placement Readiness and Professional Skill Development

- Career opportunities in commerce and management: banking, finance, HR, marketing, insurance, and analytics
- Resume building, email writing, LinkedIn basics, and professional communication
- Placement preparation: aptitude basics, group discussion, and interview techniques
- Workplace readiness: corporate etiquette, teamwork, time management, and professional behaviour
- **Case Study:** Workplace Situations and Professional Response Analysis

Practical Exposure: Resume workshop, mock interview, GD simulation, and role play

Suggested Readings:

1. Sri Ram Srirangam, Indian Economy
2. Arihant experts, Know your State Odisha
3. R S Sharma, India's Ancient Past
4. Satish Chandra, History of Medieval India
5. Rajiv Ahir, A Brief History of Modern India
6. M Laxmikanth, Indian Polity
7. R S Aggarwal, Quantitative Aptitude for Competitive Exams
8. R S Aggarwal, An advanced approach to Data Interpretation
9. Nishit K Sinha, Logical Reasoning and Data Interpretation for CAT
10. Arun, How to prepare for Quantitative Aptitude for CAT
11. Arun Sharma, How to prepare for Logical Reasoning for CAT
12. R S Aggarwal, A modern approach to Logical Reasoning by
13. R S Aggarwal, A modern approach to Verbal and Non-Verbal Reasoning by
14. B S Sijwali, A new approach to Reasoning (Verbal, Non-Verbal and Analytical)

SDG Mapping for this course:

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	• Course provides practical exposure (case studies, workshops, simulations) to enhance applied learning. • Promotes financial literacy, sustainable business knowledge, and employability skills.
SDG 5	Gender Equality	• Integration of gender sensitivity in workplace readiness and teamwork exercises. • Encourages inclusive practices in sustainable entrepreneurship and responsible business.
SDG 8	Decent Work and Economic Growth	• Placement readiness, professional skill development, and career opportunities in commerce and management. • Focus on entrepreneurship, GIG economy, and sustainable employment practices.
SDG 9	Industry, Innovation, and Infrastructure	• Exposure to advances in science and technology (AI, space research). • Encourages innovation through case studies on startups and sustainable enterprises.
SDG 12	Responsible Consumption and Production	• Sustainable product audits, circular economy, and green marketing practices. • Case studies on green brands and social enterprises.
SDG 13	Climate Action	• Coverage of environmental issues, climate change, and global initiatives (UN Climate Change Conference). • Integration of carbon markets and sustainable supply chains.
SDG 16	Peace, Justice, and Strong Institutions	• Understanding global organizations like UN, SEBI, RBI, NABARD, and their role in governance and commerce. • Promotes ethical decision-making and responsible financial practices.
SDG 17	Partnerships for the Goals	• Mapping business practices to SDGs. • Encourages collaboration between enterprises, institutions, and international organizations for sustainable development.

Code	Course Title	Credit	L-T-P
VA16146	Indian Knowledge System	2	2-0-0

Course Learning Objectives: The course on Indian Knowledge System for Commerce Students aims to introduce students to the profound and diverse intellectual traditions of India, with a focus on how these ancient knowledge systems can be integrated into modern commerce, business, and economics. This course will explore Indian philosophical, ethical, and scientific contributions, emphasizing the holistic approach to business practices, sustainability, and corporate social responsibility. Students will learn about the historical, cultural, and intellectual foundations that shaped Indian commerce and business models, and how principles like Dharma (ethics), Karma (action), and the interconnectedness of society can influence modern-day business strategies.

Course Learning Outcomes:

CO1- Define and explain key concepts such as Dharma, Karma, Ahimsa, and sustainability, and understand their relevance to modern commerce and business practices.

CO2- Apply the principles of Indian Knowledge to case studies of contemporary businesses and corporate governance practices, identifying ethical issues and proposing solutions based on Indian ethical traditions.

CO3- Analyse the role of Indian economic and philosophical traditions in shaping business practices in ancient and modern India, identifying key differences and continuities.

CO4- design business models or strategies that integrate Indian ethical principles (such as Dharma and Karma) into the operations of a modern corporation, promoting ethical conduct and sustainability.

CO5- Critically evaluate the effectiveness of integrating Indian Knowledge Systems into contemporary business practices, discussing potential challenges and benefits, and proposing recommendations for improvement.

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	3	2	1	2	3	2	1	3	2	1	1	2	3	2	1	1	1
CO2	3	3	3	3	3	2	2	3	2	2	2	2	3	3	3	3	3
CO3	3	3	3	3	3	2	1	3	3	2	1	2	2	3	3	2	3
CO4	3	3	3	3	3	3	2	3	2	3	2	3	3	2	2	3	3
CO5	3	3	3	3	3	3	2	3	2	3	2	3	2	3	3	3	3
Average	**3**	**2.8**	**2.6**	**2.8**	**3**	**2.4**	**1.6**	**3**	**2.2**	**2.2**	**1.6**	**2.4**	**2.6**	**2.6**	**2.4**	**2.4**	**2.6**

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

Course Input:

Unit I: Indian Ethical Foundations for Business (14 lectures)

Introduction to Indian Philosophy and Commerce: Understanding the ancient Indian views on ethics, business, and society as framed by the Vedas, Upanishads, and other classical texts. Dharma and Commerce: Exploring the concept of Dharma (moral and ethical duties) and its application in business ethics, corporate governance, and leadership. Karma and Responsibility in Business: Examining the role of individual actions (Karma) and how it aligns with corporate

social responsibility (CSR), sustainable business practices, and social justice. The Role of Trust and Relationships: Discussing the significance of interpersonal relationships in Indian business practices, such as the importance of trust, reputation, and long-term business partnerships.

Unit II: Indian Economic Thought and Sustainable Business Practices (16 lectures)

Ancient Indian Contributions to Commerce: Insights into ancient Indian trade, banking, and economic systems, including the role of guilds, barter systems, and the evolution of economic transactions. The Role of Sustainability in Indian Knowledge: Exploring the principles of ecological sustainability and how ancient Indian practices like Ahimsa (non-violence) and Vastu Shastra (architecture for harmony) relate to modern-day environmental sustainability and green business. Indian Concepts of Wealth and Prosperity: Examining the holistic view of wealth in Indian thought, as discussed in texts such as the Arthashastra and Manusmriti, and its relevance to contemporary wealth creation, resource management, and economic development. Modern Integration of Indian Knowledge in Commerce: Case studies on how contemporary businesses incorporate Indian ethical values, sustainability, and responsibility in their operations, particularly in the context of India's growing economy and globalization.

Recommended Textbooks:

1. "Indian Business Ethics" by Pradip N. Khandwalla
2. "The Arthashastra" by Kautilya (Chanakya)
3. "The Bhagavad Gita: A Guide to Managing the Business of Life" by R. C. Sharma
4. "Corporate Governance in India: A Historical Perspective" by A. C. Fernando
5. "Vedic Economics: The Art of Sustainable Living" by H. R. Khanna

Suggested Readings:

1. "Karma and Business: Insights from Indian Philosophy" by S. R. Sharma
2. "The Vedas and the Upanishads: Wisdom for Modern Business" by S. S. Sivananda
3. "Dharma and the Indian Economy" by T. K. S. Pillai
4. "Sustainable Development: Perspectives from Indian Philosophy" by Nandini Mehta
5. "The Wisdom of Indian Management" by Rajiv Misra

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Promotes value-based and holistic education
SDG 8	Decent Work and Economic Growth	Encourages ethical and sustainable business practices
SDG 10	Reduced Inequalities	Promotes fairness and inclusive growth
SDG 12	Responsible Consumption and Production	Supports sustainable business and resource use
SDG 16	Peace, Justice and Strong Institutions	Encourages ethical governance and justice in business

Course Code	Course Title	Total Credit	Credit Hours
VA16394	**FLUTTER APPLICATION DEVELOPMENT**	**2**	**1-0-1**

Course Objectives:

This course aims enable students to develop cross-platform applications for Android, iOS, and web while implementing best programming practices. They will also gain experience in using GitHub for source code management and app deployment to the Play Store and App Store.

Course Learning Outcomes:

CO1: Understand the fundamental concepts, principles, and technologies involved in application development.

CO2: Analyze user interface (UI) and design principles to develop user-friendly and visually effective applications.

CO3: Apply appropriate tools and techniques to design and develop functional applications.

CO4: Integrate backend services, databases, and APIs to ensure effective application functionality and data management.

CO5: Demonstrate the ability to deploy, test, and publish applications on appropriate platforms.

CO–PO-PSO Mapping Matrix using standard correlation levels:
3 = High, 2 = Medium, 1 = Low, – = No correlation

COs \ POs/PSOs	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
CO1	3	2	1	2	3	2	1	1	2	1	2	2	3	2	1	1
CO2	2	3	2	2	3	2	1	1	2	2	2	2	2	3	1	1
CO3	3	3	3	3	3	2	2	1	2	3	3	2	3	2	2	2
CO4	3	3	3	3	3	2	1	2	3	2	3	2	2	2	3	2
CO5	2	2	2	3	3	3	2	2	3	3	3	3	2	2	2	2

Course Input:

Unit I: Introduction to Mobile App Development, Dart, Flutter & Git (15 Lectures)

Introduction to mobile app development, History, Platforms, Native vs Hybrid Apps, Existing tools, Why Flutter?, Why Dart ?, Mobile Development key terms. Dart: History, Introduction, Environment, Syntax, Data Types, Variables, Operators, Loops,Decision making, List, Map, Functions, Parameters (Default+Named), Class, Constructor, Inheritance, Interfaces, Overriding, Operator overloading, Keywords, Null Safety, Getters & Setters, Exception handling, Lambdas, Higher Order Functions, Closures, Future, Stream. Flutter: Introduction, UI, Architecture, Key Terms, Development Environment. Git: Creating a repository on local & GitHub, Pushing local changes into the repository, Pulling and cloning projects from the repository, Branching, Merging & Pull requests

Unit II: Designing and Publishing Apps (15 Lectures)

Flutter App Structure, Introduction to Widgets, Build method, Stateful vs Stateless Widgets, Some Important Widgets, Layout widgets, Handling gestures, Building complex UI, Navigation &Routing, REST APIs, Working with JSON, Using Assets, File Handling, SQLite & Firebase, Forms & validation, Animations Basics, Reactive Programming: Streams and Data handling, State Management with Flutter, Basic Testing: Unit and Integration Testing, Custom Components, App Publishing, Project Management Basics.

Recommended Learning Resources:

Textbooks

1. Flutter Documentation - https://docs.flutter.dev/
2. Flutter for Beginners: An introductory guide to building cross-platform mobile applications with Flutter 2.5 and Dart, 2nd Edition – Thomas Bailey, Alessandro Biessek

Reference Material & Digital Resources

FreeCodeCamp -Flutter Course for Beginners – 37-hour Mobile App Development Tutorial (freecodecamp.org)

SDG Mapping

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Enhances digital and technical skills in application development
SDG 8	Decent Work and Economic Growth	Improves employability in IT and software development sectors
SDG 9	Industry, Innovation and Infrastructure	Promotes innovation through app development and digital solutions
SDG 12	Responsible Consumption and Production	Encourages efficient digital solutions reducing resource usage
SDG 16	Peace, Justice and Strong Institutions	Promotes secure and ethical digital applications

Code	Course Title	Credit	L-T-P
VA16422	**Human Values and Professional Ethics**	**2**	**2-0-0**

Course Learning Objectives:

To assist students in understanding the role of values and ethics in establishing a fair and equitable social order and to encourage students to inculcate human values and morals in their professional lives.

Course Learning Outcomes: The students will realise the significance of values and ethics in their own lives and professional engagements. The students would acquire the rights and responsibilities as an employee, team member and world citizen.

Enabling the attainment of Course Learning Outcomes

CO1- Comprehend the implications of Human Values in one's life.

CO2- Understand the ideas of human values by discussion and explanation.

CO3- Apply the concepts and practices in their daily life.

CO4- Analyze the links between human values and professional ethics.

CO5- Evaluate and judge what to do and what not to do.

CO–PO-PSO Mapping

Program Outcomes → / **Course 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**
CO1	2	2	1	2	2	2	1	2	2	1	2	2	3	2	2	2	2
CO2	3	2	2	2	3	2	1	2	2	2	2	2	3	2	2	3	2
CO3	3	3	2	2	3	2	2	3	2	2	2	2	3	2	3	3	2
CO4	3	3	3	2	3	3	2	3	2	3	2	3	2	2	3	3	3
CO5	3	3	3	3	3	3	2	3	3	3	2	3	2	2	3	3	3
Average	2.8	2.6	2.2	2.2	2.8	2.4	1.6	2.6	2.2	2.2	2	2.4	2.6	2	2.6	2.8	2.4
Mapping Scale:																	
1 – Low (Weakly Mapped)								3 – High (Strongly Mapped)									
2 – Medium (Moderately Mapped)								"–" No Correlation									

Course Inputs:

UNIT I: Introduction of Human Values

Need, fundamental guidance, content material and method for cost education: need of self-introspection, understand happiness and prosperity, approach to meet the human aspirations, information and dwelling in concord at numerous levels.

UNIT II: Introduction of Professional Ethics

Basic concepts, personal and professional ethics, lifestyles skills, emotional intelligence, thought of ethics, value education, ethical development, work place- right and responsibilities.

References

1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.

2. The Human Values: Dewan, M.L., Hosdurg, A. K., Nayak, P., Concept publishing company, New Delhi, 2009.

E References

- **e-PG-Pathshala**
- **NMEICT/any other Government Initiatives**
- **NPTEL Online Courses URL:** https://nptel.ac.in/course.html
- **SWAYAM courses URL:** https://swayam.gov.in/explorer
- **MOOC Courses URL:** https://www.mooc.org/#course-categories
- **KISS LMS**: : https://learn.kiss.ac.in

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Promotes value-based education and ethical awareness
SDG 5	Gender Equality	Encourages equality and respect
SDG 8	Decent Work and Economic Growth	Promotes ethical workplace practices
SDG 10	Reduced Inequalities	Encourages fairness and inclusiveness
SDG 16	Peace, Justice and Strong Institutions	Promotes justice, ethics, and responsible citizenship

Code	Course Title	Credit	L-T-P
VA16430	Life Skills Education	2	2-0-0

Course Learning Objectives:

This course is designed to equip students with essential life skills by enhancing their understanding of life skills concepts and practices, enabling them to cope effectively with everyday challenges, make rational decisions, manage sexual and reproductive health (SRH) concerns, and develop an understanding of the life cycle and developmental aspects of the girl child.

CO1: Understand concepts and importance of life skills.

CO2: Apply life skills to cope with daily challenges.

CO3: Analyze social norms, gender issues, and health concerns.

CO4: Develop decision-making and problem-solving abilities.

CO5: Evaluate personal behavior and adopt responsible practices.

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	3	2	1	1	2	2	1	2	2	1	2	2	2	1	1	2	2
CO2	2	2	3	2	3	3	2	3	2	2	2	3	3	2	2	3	3
CO3	2	3	2	2	3	2	2	3	2	2	2	2	3	2	1	3	2
CO4	2	2	3	2	3	3	2	3	2	3	2	3	3	3	2	3	3
CO5	2	3	2	3	3	2	2	3	2	3	2	3	3	2	2	3	3

Average	**2.2**	**2.4**	**2.2**	**2**	**2.8**	**2.4**	**1.8**	**2.8**	**2**	**2.2**	**2**	**2.6**	**2.8**	**2**	**1.6**	**2.8**	**2.6**

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

Course Input:

Unit- I Introduction to Life Skills

Concept of Skills and Life Skills • Definition and importance of life skills • Ten core Life skills (WHO model) • Life Skills Education, Life Skills Approach, Life Skills Based Education, Social Skills, Self Awareness (Self concept, Self Confidence, Techniques used for knowing self : Open your heart, SWOT analysis, Johari window) • Empathy (Meaning of empathy, differences between sympathy and empathy) • Effective Communication(components of effective communication, Styles of communication, Barriers in communication, How to say NO) • Interpersonal Relationship(Meaning, types ,qualities for effective interpersonal relationship, end the relationship constructively), Thinking Skills and Coping Skills , Critical thinking and Creative thinking (Definition and Stages) • Problem solving and Decision making (Definition, Steps in problem solving and decision making, Models of decision making) • Meaning and types of emotions, coping strategies • Meaning and sources of stress, coping strategies, Life Skills Education for enhancing value of the girl child, Survival of girl child,

Unit II: Social norms

Barrier to survival Lack of access and control over resources Policies, schemes, programs related to foeticide, Puberty and Marriage, Health and Reproductive health (Definition, Communicable diseases, Reproductive health issues) Life Skills for responsible sexual behavior Menstrual hygiene and care Institutional barriers for awareness, myth busting around menstruation and sanitation Schemes and programs related to menstruation Marriage and evolving gender roles Acts and Laws related to marriage includes laws on PMCA and POCSO as well as Sexual Harassments at workplace • Negligence of girl child and Violence Gender inequalities in curative and preventive health care (Anaemia, Malnutrition and stunting) Gender norms affecting education Discriminatory gender biased norms & practices Acts and Laws related to: Gender Based Violence, domestic violence, Dowry & dowry death Early Pregnancy and its prevention Motherhood Penalty & Concretization of Patriarchal Norms Course Outcomes (COs)

Text Books Recommended:

1. Dahama O.P., Bhatnagar O.P, (2005), Education and Communication for Development, (2nd Edn.), Oxford& IBH Publishing Co. Pvt. Ltd. New Delhi.
2. Duffy Grover Karen, Atwater Eastwood, (2008), (8th Edn.), Psychology for Living-Adjustment, Growth and Behaviour Today, Pearson Education Inc, New Delhi.
3. Jane S Halonen, John W. Santrock, (2009), Psychology: Context & Application, McGraw-Hill Companies Inc., Third Edition, USA
4. Mangal S.K., (2008), An Introduction to Psychology, Sterling Publishers Pvt. Ltd., New Delhi.
5. Nair .V. Rajasenan, (2010), Life Skills, Personality and Leadership, Rajiv Gandhi National Institute of Youth Development, Tamil Nadu.
6. Nair. A. Radhakrishnan, (2010), Life Skills Training for Positive Behaviour, Rajiv Gandhi National Institute of Youth Development, Tamil Nadu.

Suggested Readings:

1) Nair. V.Rajasenan,(2010), Life Skills, Personality and Leadership, Rajiv Gandhi National Institute of Youth Development,Tamilnadu
2) RGNIYD (2008) Facilitators Manual on Enhancing Life Skills,Tamilnadu
3) Family Health International, NACO,USAID(2007),Life Skills Education tool kit for Orphans and vulnerable children in India
4) Morgan and King,(1993) Introduction to Psychology, Tata McGraw-Hill Publishing Company Ltd,New Delhi.
5) Wallace R. M.asters,(2001) Personal Development for Life and Work: UK,South Western
6) Adolescence and Life Skills (2003) Commonwealth Youth Programme Asia Centre, Tata Mc Graw. Hill Websites: UNFPA-http://www.unfpa.org/ UNICEF-http://www.unicef.org/ WHO –http://www.who.int./en/ Jhpiego - https://www.jhpiego.org/countries-we-support/india/

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-being	Promotes mental, emotional, and reproductive health awareness

SDG 4	Quality Education	Enhances life skills and holistic learning
SDG 5	Gender Equality	Focus on gender issues, girl child development, and equality
SDG 10	Reduced Inequalities	Addresses social and gender inequalities
SDG 16	Peace, Justice and Strong Institutions	Encourages responsible and ethical behaviour

Code	Course Title	Credit	L-T-P
VA16482	**Self-help and Happiness**	**2**	**2-0-0**

Course Learning Objectives

This course aims to promote students' mental well-being by developing resilience, self-monitoring, and self-mentoring skills, reducing anxiety and stress, fostering healthy relationships, and enhancing creativity, positivity, and overall psychological well-being through experienMinortial learning.

Course Outcomes

CO1 Developing self-resilience and enhancing capacity building

CO2 Developing self-monitoring and self-mentoring skills

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	2	1	1	2	2	1	2	2	1	2	2	2	1	1	2	2

CO2	2	2	2	2	3	3	2	3	2	2	2	3	3	2	2	3	3
CO3	2	3	2	2	3	2	2	3	2	2	2	2	3	2	2	3	2
CO4	2	2	3	2	3	3	2	3	2	3	2	3	3	3	2	3	3
CO5	3	3	3	3	3	3	2	3	3	3	2	3	3	2	3	3	3
Average	**2.2**	**2.4**	**2.2**	**2**	**2.8**	**2.6**	**1.8**	**2.8**	**2.2**	**2.2**	**2**	**2.6**	**2.8**	**2**	**2**	**2.8**	**2.6**

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

Course Input:

Unit I: Mental Health, Stress, Relationships and Well-being

Anxiety, nature, types, fear, phobias (generalised and specific) and different types of phobias Stress, definition, nature, types and sources of stress. Stress appraisal, effects of stress on psychological functioning and health, PTSD (Post-traumatic stress disorder) Relationships, Dynamics of relationships, evolution, transition, integration and transformation Happiness-definition, positive wellbeing, dynamics an integrative look at happiness

Unit-II Activity Based Practical Learning

Measurement of anxiety and strategies to deal with anxiety attacks and fear, administration and scoring of SCAT (Sinha's comprehensive anxiety test). Activity Catharsis (emotional unburdening) Overcoming Stress and strategies to handle stress, developing psychosocial support, Therapy (Art, music and colour therapy) activity-based learning Measurement of relationships, developing healthy relationships activity- role playing (psychodrama and socio drama) Happiness - the body and mind in a coordination cognitive behavioral intervention, overcoming fear (activity) increase your own happiness and enjoying solitude- activity based learning.

References:

1. Psychology – IB – John Crane and Jette Hannibal
2. Psychology – NCERT Class-XII
3. Colour Therapy: An Anti-Stress Colouring Book by Cindy Wilde Laura
4. **SDG Mapping for this Course**

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-being	Promotes mental health, stress management, emotional resilience, and psychological well-being.
SDG 4	Quality Education	Develops life skills, self-monitoring, self-mentoring, and experiential learning.
SDG 5	Gender Equality	Encourages healthy interpersonal relationships, inclusiveness, and gender sensitivity.
SDG 10	Reduced Inequalities	Fosters psychosocial support, empathy, and equal opportunities for mental well-being.
SDG 16	Peace, Justice and Strong Institutions	Promotes responsible behaviour, emotional regulation, conflict resolution, and ethical decision-making.

Course Code	Course Title	Total Credit	Credit Hours
VA16486	**Pioneering Service Learning and Community Development**	**2**	**2-0-0**

Course Objectives:

Pioneering, Service Learning, and Community Development are interconnected concepts that involve proactive engagement with communities to address needs, foster positive change, and enhance the well-being of individuals and society. This course emphasizes the experiential learning, encouraging students to apply theoretical knowledge in real-world settings.

Course Learning outcomes:

CO1- Develop a strong sense of civic responsibility and an understanding of the global context of local community issues.

CO2- Exhibit a commitment to ethical behavior and social justice principles in all aspects of community work.

CO3- Apply knowledge, skills, and attitudes in an integrated manner to develop and implement a community project.

CO4-Foster reflective thinking on personal growth and community impact. Encourage critical analysis of the societal and systemic issues related to community development.

CO5- Critically analyzing personal and community development experiences. Develop the decision making skill.

CO–PO-PSO Mapping Matrix using standard correlation levels:
3 = High, 2 = Medium, 1 = Low, – = No correlation

COs \ POs/PSOs	**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**
CO1	3	2	1	2	3	2	2	3	2	2	1	2	3	2	2	1
CO2	3	3	2	2	3	2	1	3	2	2	1	2	2	2	2	1
CO3	3	3	3	3	3	3	3	3	2	3	2	3	3	3	3	3
CO4	3	3	3	3	3	2	2	3	2	2	2	3	2	2	2	2
CO5	3	3	3	3	3	3	2	3	2	3	2	3	2	2	2	3

Course Contents:

Unit-I Pioneering and Service Learning (15 Lectures)

History of Rovers and Ranger, Aims, Promise & Law, Principles, Motto, Sign of Rovers and Rangers**,** History of Rovering and Rangering (scout &guide), Principles of scout guide movement, Pioneering Skills: importance of pioneering and Types of pioneering**,** Basic Pioneering, Advanced Pioneering, Knot Tying.

Service learning and Activities: Scouting Principles and Service ,role and responsibilities of volunteers , Women Empowerment Programme, Blood Donation Camp, Legal Awareness Programme, health camp, attend Survive Camp, Swachha Bharat Programme, Environment Protection Programme, celebration of national and international days , BSG Foundation Day / BSG Flag Day, Independence Day, Republic Day, National Unity Day, Thinking Day (Girl Guides), St. George's Day (Scouts & Guides), World Scout Day: Environment Day (June 5th), International Day of Peace, International Day for Disaster Reduction ,

Youth Leadership and Empowerment: Principles and practices of effective youth leadership. Participants will develop skills for self-leadership, team leadership, and community engagement

Unit- II Community Development /Community Service Projects:

Community Health and Well-being**,** Community Development Strategies, Identifying and analyzing the needs of communities, Community Service Projects, Designing and implementing community service projects that address local needs. Leadership Training and Team Building Activities, Engaging in team-building exercises and activities to strengthen group cohesion. Emphasizing the importance of collaboration in community development.

Recommended Learning Resources:

Textbooks

1. **The Scout Handbook** by Boy Scouts of India
2. Scouting and Guiding Around the World by John Long
3. The History of Girl Guiding by Elizabeth Hammill
4. The History of Scouting by John Thurman
5. The Girl Scout Counselor's Guide by Girl Scouts of the India
6. Scout/Guide Proficiency Badges Book
7. Bharat Scouts and Guides Handbook

Reference Material & Digital Resources

1. Centers for Disease Control and Prevention (CDC): https://www.cdc.gov/
2. World Health Organization (WHO): https://www.who.int/
3. Public Health England (PHE): https://www.gov.uk/government/organisations/public-health-england
4. American Public Health Association (APHA): https://www.apha.org/
5. The National Institute of Mental Health (NIMH): https://www.nimh.nih.gov/
6. Healthy People 2030: https://healthypeople.gov/
7. Points of Light: https://www.pointsoflight.org/
8. Volunteer Match: http://www.medicineandbeyond.org/boston%2C%2Bma%2C%2Busa.html
9. Idealist: https://www.idealist.org/en and Volunteer World: https://www.volnow.org/

SDG Mapping

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-being	Health camps, awareness programs
SDG 4	Quality Education	Experiential learning and skill development
SDG 5	Gender Equality	Women empowerment initiatives
SDG 11	Sustainable Cities and Communities	Community development and local engagement
SDG 13	Climate Action	Environmental awareness and protection

		programs
SDG 16	Peace, Justice and Strong Institutions	Civic responsibility and ethical citizenship

Course Code	Course Title	Total Credit	Credit Hours
VA16488	**Sports and Yoga**	**2**	**2-0-0**

Course Objectives

The course is designed to provide students with a fundamental understanding of Physical Education, Sports, and Yoga while promoting physical fitness, health, and overall well-being. It aims to develop basic knowledge and practical skills in physical activities, encourage discipline and teamwork, and inspire students to adopt a healthy lifestyle through regular participation in sports and yoga.

After successful completion of the course, students will be able to:

CO1: Explain the fundamental concepts and importance of Physical Education, Sports, and Yoga in promoting health and well-being.

CO2: Demonstrate basic physical fitness exercises, sports skills, and yoga practices for overall physical and mental development.

CO3: Apply the principles of health, fitness, nutrition, and wellness to maintain a healthy lifestyle.

CO4: Develop discipline, teamwork, leadership, sportsmanship, and ethical values through participation in physical activities and sports.

CO5: Adopt lifelong habits of regular physical activity and yoga to improve fitness, reduce stress, and enhance quality of life.

CO–PO–PSO Mapping Table

COs \ POs/PSOs	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
CO1	3	2	1	1	2	2	2	2	2	1	2	2	2	1	1	1
CO2	3	3	2	2	3	2	2	2	3	2	2	2	3	2	2	2

CO3	3	3	2	2	3	3	3	3	2	2	2	3	2	2	2	2
CO4	2	2	3	2	2	3	3	3	3	3	2	3	2	2	2	3
CO5	2	3	2	2	3	3	3	3	2	2	3	3	2	2	3	3

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

Course Inputs:

Unit-I Introduction

1. Meaning and definition of Physical Education, Sports and Yoga.
2. Aims, Objectives and Importance of Physical Education, Sports and Yoga.
3. History of Physical Education, Sports and Yoga.
4. Modern trends of Physical Education, Sports and Yoga.
5. Brief concept of Education in relation to Physical Education, Sports and Yoga

Unit -II Yoga & Fitness Training

1. Importance of Yoga & Fitness
2. Fundamentals Principles of Yoga & Fitness Training
3. Components of Fitness and Fitness Equipments
4. Types of Yoga Practices - Asanas, Pranayama and Meditation
5. Introduction to Balanced Diet for Fitness

Reference Books

1. Bucher, C. A. (n.d.) Foundation of physical education. St. Louis: The C.V. Mosby Co. Deshpande, S. H. (2014). Physical Education in Ancient India. Amravati: Degree college of Physical education.
2. Mohan, V. M. (1969). Principles of physical education. Delhi: Metropolitan Book Dep. Nixon, E. E. & Cozen, F.W. (1969). An introduction to physical education. Philadelphia: W.B. Saunders Co.
3. William, J. F. (1964). The principles of physical education. Philadelphia: W.B. Saunders Co.
4. Coalter, F. (2013) Sport for Development: What game are we playing?.Routledge.
5. Singh Hardayal (1991), Science of Sports Training, DVS Publication, New Delhi 6. Muller, J. P.(2000). Health, Exercise and Fitness. Delhi : Sports.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution

SDG 3	Good Health and Well-being	Promotes physical fitness and healthy lifestyle
SDG 4	Quality Education	Enhances experiential and skill-based learning
SDG 5	Gender Equality	Encourages inclusive sports participation
SDG 11	Sustainable Cities and Communities	Preserves traditional cultural practices
SDG 16	Peace, Justice and Strong Institutions	Promotes fairness, discipline, and teamwork

SEMESTER-III

Code	Course Title	Credit	L-T-P
GO20001	**Climatology**	**4**	**3-1-0**

Course Objectives: The main objectives of Climatology courses are: This course provides an introduction to the weather and climate and components, layering of atmosphere with special emphasis on insolation and heat budget of earth. The course would enable the students about global pressure belts and wind system. Students can get a clear picture of different types of moisture, cyclones and various climatic regions of the world. They will get to know how different climatic issues of the world effect on human landscape and how to mitigate these issues.

Course Learning Outcomes:

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

CO1: Remember the concept of weather, climate and various components of these.

CO2: Understand the concept of Biome and major biomes of the world, Eutrophication, causes and consequences, signification of environmental geography.

CO3: Apply to manage solid waste.

CO4: Analyze to environmental impact assessment, social impact assessment.

CO5: Evaluate the perennial problems in EIA and SIA implementation. Effects of EIA and SIA in development projects.

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	3	2	–	–	–	–	2	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	–
CO3	3	3	2	3	1	–	3	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	3	2	2	1	2	2	3	3	3	2	2
CO5	3	3	3	3	2	–	3	2	2	1	3	3	3	3	3	2	2
Average	**3**	**2.8**	**2**	**2.2**	**1**	**–**	**2.6**	**1.6**	**1.2**	**0.6**	**1.8**	**1.8**	**3**	**2.8**	**2.2**	**1.4**	**1**

Mapping Scale:

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

Course Input

UNIT: I Meaning of Weather and Climate

Definition and significance of weather and climate, Components of weather and climate, Atmospheric composition and structure: Variation with altitude, Latitude and seasons.

UNIT: II Insolation and Heat Budget of Temperature

Factors controlling the distribution of insolation, Temperature; vertical and horizontal distribution of temperature, Inversion of temperature, Heat budget.

UNIT: III Atmospheric Pressure and Winds

Meaning and types, Types of wind: planetary winds, Forces affecting winds, General circulation, periodic and local winds, Jet Stream, El Nino-La Nina.

UNIT: IV Atmospheric Moisture

Humidity, Measurement of humidity, Meaning, definition and forms of condensation, Precipitation, types of precipitation, types of rainfall and its formation, types and formation,

UNIT: V Cyclones and Anticyclones

Tropical Cyclone: Characteristics, Formation, Structure, and Impacts, Extra Tropical cyclones: Origin, Characteristics, and Weather Conditions, Anticyclones: Formation, Characteristics, and Associated Weather, Monsoon- Origin and Mechanism.

Recommended Books:

1. Aguado,E and Burt,J.E.(2001) Understanding Weather and Climate, Printice Hall, Upper Saddle River, New Jersey, pp. 1-474
2. Barry, R.G. and Chorley, R.J.(1995) Atmosphere, Weather and Climate, Routledge, London and New York
3. Barry, R.G. and Perry, A.H.(1973) Synoptic Climatology; Methods and Applications, Methuen, London
4. Boucher,K.(1975) Global Climates, Halstead Press, New York
5. Brasseur,G.P.,et.al. (1999) Atmospheric Chemistry and Global Change, Oxford University Press, New York
6. Singh S.(2014) Environmental Geography, Pravalika Publications, Allahabad.
7. Sharma P.D. (2009) Ecology and Environment, Rastogi Publications, Meerut-New Delhi, Second Reprint (10th edition).

Sharma P.D (2016) Ecology and Environment, Rastogi Publications, Meerut-New Delhi, (13th edition).

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Knowledge of climate systems and environmental awareness
SDG 11	Sustainable Cities & Communities	Climate-resilient urban and regional planning
SDG 13	Climate Action	Understanding climate change, cyclones, and mitigation strategies
SDG 15	Life on Land	Impact of climate on ecosystems and biodiversity

Code	Course Title	Credit	L-T-P

GO20003	Oceanography	4	3-1-0

Course Learning Objectives:

The main objectives of the Oceanography course are to educate and empower students to apply their knowledge creatively in marine environments and coastal management, while also nurturing experts in physical geography who possess the requisite knowledge and motivation to excel in their fields, whether through higher education or professional advancement. The course further seeks to provide the knowledge and skills essential for shaping an environmental science and environmental protection-oriented thinking paradigm. At the same time, it focuses on developing and fostering critical thinking, along with cultivating a strong sense of civic responsibility toward our planet, our communities, and the nation as a whole.

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

CO1: Remember the origin of oceans and ocean water.

CO2: Understand the various aspects of Ocean Resources and Sea level changes.

CO3: Apply the porosity and capillary action in aquifers in their village.

CO4: Analyse the Marine Environment.

CO5: Evaluate the Water balance and deficit and Ground water levels.

CO6: Create awareness to save water and reduce the Marine Pollution.

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	3	2	–	–	–	–	2	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	–

CO3	3	3	2	3	1	–	3	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	3	2	2	1	2	2	3	3	3	2	2
CO5	3	3	3	3	2	–	3	2	2	1	3	3	3	3	3	2	2
CO6	3	3	3	3	2	1	3	3	2	1	3	3	3	3	3	3	3
Average	**3**	**2.8**	**2.2**	**2.3**	**1.2**	**0.2**	**2.7**	**1.8**	**1.3**	**0.7**	**2**	**2**	**3**	**2.8**	**2.3**	**1.7**	**1.3**

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

Course Inputs:

UNIT-I: Bottom Relief of Ocean, Atlantic Ocean, Indian Ocean and Pacific Ocean

UNIT-II: Temperature and salinity of Ocean- determinants and distribution, T-S Diagram

UNIT-III: Movement of Ocean water- Waves, Currents (Atlantic, Pacific and Indian) Tides: Types and Theories

UNIT-IV: Ocean Deposits: Types and Distribution, Coral Reefs: Types, Theory of Origin (Darwin and Dana, Louis Agassiz)

UNIT-V: Sea Level rise and its impacts on coastal areas, Marine pollution: Factors and causes.

Text Book Recommended:

1. Sharma, R.C. and Vital, M. (2018), Oceanography for Geographers, NCERT2.
2. Lal, D.S., (2017), Oceanography, PUSTAK BHAWAN

Suggested Readings:

1. King, L.C.: Oceanography
2. Singh, S.; Physical Geography
3. Karanth, K.R., (1988), Ground Water: Exploration, Assessment and Development, Tata-McGraw Hill, New Delhi
4. Singh, Vijay P. (1995), Environmental Hydrology, Kluwer Academic Publications, the Netherlands
5. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014), Landscape Ecology and Water Management, Proceedings of IGU Rohtak Conference, Volume 2.
6. Andrew. D. Ward and Stanley, Trimble (2004), Environmental Hydrology, 2ndedition, Lewis Publishers, CRC Press

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Knowledge of ocean systems and marine environment
SDG 11	Sustainable Cities & Communities	Coastal zone management and sea level rise impacts
SDG 13	Climate Action	Sea level rise, ocean warming, and climate interactions
SDG 14	Life Below Water	Marine ecosystems, coral reefs, and ocean conservation
SDG 15	Life on Land	Coastal ecosystem protection and land–sea interaction

Course Category Minor for other Discipline students

Semester -III

Course Code	Title	L-T-P	Total Credit
GO22001	**Climate Science**	**3-1-0**	**4**

Course Objectives: This course aims to:

1. Introduce students to the fundamental concepts, scope, and importance of climatology.
2. Provide knowledge about the origin, composition, and layered structure of the atmosphere.
3. Develop understanding of atmospheric moisture and related phenomena such as clouds, fog, and precipitation and Build awareness of global warming, climate change processes, and their environmental impacts.

Course Outcomes:

After completing this course, students will be able to:

CO1: Define climatology and explain its nature, scope, and sub-divisions.
CO2: Describe the origin, composition, and structure of the atmosphere.
CO3: Explain the concept of insolation and analyse heating and cooling processes of the atmosphere.
CO4: Analyse global climate patterns including temperature, pressure, and wind systems.

CO5: Evaluate the causes, evidences, and impacts of climate change and global warming on Earth.

CO-PO-PSO Mapping

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	1	1	–	1	1	–	1	2	3	2	1	–	1
CO2	2	3	2	2	2	2	–	2	2	–	2	2	3	2	2	–	2
CO3	2	3	3	3	3	2	1	2	2	1	2	3	3	3	2	1	2
CO4	2	3	3	3	3	2	2	2	2	1	2	3	3	3	3	2	3
CO5	3	3	3	3	3	2	2	3	3	2	3	3	3	3	3	3	3
Average	**2.2**	**3**	**2.6**	**2.6**	**2.4**	**1.8**	**1**	**2**	**2**	**0.8**	**2**	**2.6**	**3**	**2.6**	**2.2**	**1.2**	**2.2**

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

Course Inputs:

Unit I: Basic Concepts of Climatology: Nature and Scope of Climatology, Types and Sub divisions of Climatology

Unit II: Origin and structure of the Atmosphere: Meaning and Significance, Composition of Atmosphere, Structure of Atmosphere

Unit-III: Insolation and Temperature: Insolation: Definition, Mechanism, Solar Radiation, Heating and cooling process of the atmosphere-Radiation, Conduction, convection, and advection.

Unit-IV: Atmospheric Moisture: Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation

Unit -V: Climate Change: Global Warming: Problems, Evidences Processes. Impact of Climate change on Earth. And Submission of Assignment.

Text Book

1. Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhavan, Allahabad

Reference Books:

1. Singh, S (2022): Pravalika Publication, Prayagraj
2. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.

Reference website:

1. https://imdpune.gov.in/training/training%20notes/Climatology-IMTC.pdf
2. https://egyankosh.co.in/books/mgg-005
3. https://onlinecourses.swayam2.ac.in/e-learning/preview/cec21_hs03

SDG Mapping for this course

SDG No.	SDG Title	Nature of Contribution
SDG 4	**Quality Education**	Develops fundamental knowledge of climatology, atmospheric processes, and climate systems, promoting scientific understanding and environmental literacy.
SDG 11	**Sustainable Cities and Communities**	Enhances understanding of weather, climate variability, and climate-related hazards to support sustainable urban planning and disaster resilience.
SDG 13	**Climate Action**	Builds awareness of climate change, global warming, their causes, impacts, and mitigation strategies, encouraging climate-resilient decision-making.
SDG 15	**Life on Land**	Explains the influence of climate on terrestrial ecosystems, biodiversity, vegetation, and land resources, supporting ecosystem conservation.

Code	Course Title	Credit	L -T -P
CS23001	**Introduction of Artificial Intelligence and Machine Learning**	**3**	**2-0-1**

Course Learning Objective: Develop a foundational understanding of AI and ML concepts, algorithms, and applications to improve decision-making and problem-solving in a business context.

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

CO1: Understand the fundamental concepts of Artificial Intelligence, Machine Learning, intelligent agents, and their relevance in business and management contexts.

CO2: Apply supervised and unsupervised machine learning techniques such as regression, classification, and clustering for solving business problems.

CO3:Analyze the application of machine learning in functional areas like marketing, finance, and operations for data-driven decision-making.

CO4:Evaluate ethical issues related to AI and ML, including bias, transparency, accountability, and their impact on society and employment.

CO5:Examine emerging trends in AI and ML (such as deep learning, NLP, and computer vision) and assess their potential for innovation and business strategy.

CO–PO Mapping Matrix

(3 = High, 2 = Medium, 1 = Low, – = No correlation)

COs ↓	**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**
CO1	3	3	2	2	3	2	1	2	2	2	3	2	3	2	2	2
CO2	3	3	3	3	3	2	2	3	2	2	3	2	3	3	2	3
CO3	3	3	3	3	3	3	2	3	2	3	3	2	3	3	3	3
CO4	3	3	2	2	3	3	1	3	3	2	2	3	3	2	2	3
CO5	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3

Course Inputs:

Unit 1: Introduction to Artificial Intelligence [9 Classroom Contact Hours]

What is AI? History and philosophical foundations, Intelligent agents and problem-solving approaches in AI, Applications of AI in various industries. (Case studies relevant to Management)

Readings:

- [Article] A. McAfee & E. Brynjolfsson (2017). Machine, Platform, Crowd: Harnessing the Power of a Digital Future. W. W. Norton & Company. (Ch. 2)

Unit 2: Introduction to Machine Learning [9 Classroom Contact Hours]

Supervised learning: Regression and Classification algorithms (Linear Regression, Decision Trees), Unsupervised learning: Techniques for data exploration and clustering (K-Means

clustering, Principal Component Analysis), Model evaluation metrics for supervised and unsupervised learning.

Readings:

- [Online Resource] Machine Learning Crash Course by Google: https://developers.google.com/machine-learning/crash-course

Unit 3: Applications of Machine Learning in Management [9 Classroom Contact Hours]

Machine Learning in Marketing: Customer segmentation, targeted advertising, and recommendation systems, Machine Learning in Finance: Fraud detection, credit risk assessment, and algorithmic trading, Machine Learning in Operations: Supply chain management, demand forecasting, and resource optimization.

Readings:

- [Research Paper] Example research paper on a specific application of ML in Management (chosen by instructor).

Unit 4: Ethical Considerations and Societal Impact of AI and ML [9 Classroom Contact Hours]

Algorithmic bias and fairness in AI and ML systems, Explain ability and transparency of AI and ML models, The future of work and job displacement due to AI and ML.

Readings:

- [Article] E. Brynjolfsson & A. McAfee (2021). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W. W. Norton & Company. (Ch. 10)
- [Report] The Ethics of Artificial Intelligence by The European Commission's High-Level Expert Group on Artificial Intelligence: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2021%3A205%3AFIN

Unit 5: Future Trends and Business Opportunities in AI and ML [9 Classroom Contact Hours]

Emerging areas in AI and ML: Deep Learning, Natural Language Processing, Computer Vision, The role of AI and ML in business strategy and innovation.

Readings:

- Articles on recent advancements and business applications of AI and ML (chosen by instructor).

- **Reference Books:**
  1. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig. [Pearson Education]
  2. Machine Learning for Dummies by John Paul Mueller & Luca Massaron. [Wiley]
  3. Hands-On Machine Learning with Scikit-Learn,

SDG Mapping for this Course

SDG	Title	Contribution
4	Quality Education	AI awareness for non-CS students
8	Decent Work and Economic Growth	Future skill orientation
9	Industry, Innovation and Infra	Intelligent systems overview
10	Reduced Inequalities	Using / critiquing AI for inclusion
13	Climate Action	Examples: precision agri, climate models

Code	Course Title	Credit	L – T – P
AE24001	**Communicative English**	**2**	**2-0-0**

Learning Objectives:

1. Develop advanced communication skills in English.

2. Enhance vocabulary range and grammatical accuracy.

3. Improve comprehension of complex texts and spoken English.

4. Cultivate critical thinking and expression in English.

Course Learning Outcomes: On completion of this course, the students should be able to**:**

CO1: Demonstrate advanced understanding and application of grammar and vocabulary in written and spoken communication.

CO2: Communicate effectively through speaking and listening by presenting arguments, participating in discussions, and interpreting implied meanings.

CO3: Analyze and interpret complex texts such as articles, essays, and reports using critical reading skills.

CO4: Produce well-structured academic writing including essays, reports, and critical reviews following appropriate conventions and citation styles.

CO5: Develop overall communication competence for academic and professional contexts.

CO–PO Mapping Matrix

(3 = High, 2 = Medium, 1 = Low, – = No correlation)

COs ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	2	3	3	2	2	2	2	2	2	3	2	2	2
CO2	2	3	3	2	3	3	3	2	2	3	2	2	3	3	2	3
CO3	3	3	2	3	3	2	2	3	2	2	2	3	3	2	3	2
CO4	3	3	2	3	3	3	2	3	2	3	2	3	3	2	3	3
CO5	3	3	3	3	3	3	3	2	2	3	2	3	3	3	3	3

Course Inputs

Unit 1: Advanced Grammar and Vocabulary (10 Hours)

Advanced grammar topics: tense, voice, conditionals, modals, Vocabulary expansion: synonyms, antonyms, idioms, collocations

Unit 2: Advanced Speaking and Listening Skills (10 Hours)

Expressing opinions, arguments, and hypotheses, conducting debates and discussions, Listening for inference and implied meaning

Unit 3: Advanced Reading and Writing (10 Hours)

Reading and analyzing authentic texts: articles, essays, reports, Writing essays reports, and critical reviews, Academic writing conventions and citation styles

Text Book Readings:

1. "Advanced Grammar in Use" by Martin Hewings
2. "Oxford Advanced Learner's Dictionary" by Oxford University Press
3. "English for Academic Study: Listening" by Colin Campbell and Joanne Collie

Suggested Reading:

1. "The Elements of Style" by William Strunk Jr. and E.B. White
2. "How to Write a Lot: A Practical Guide to Productive Academic Writing" by Paul J. Silvia
3. "Practical English Usage" by Michael Swan

Note: Latest edition of books may be used

SDG Mapping

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Enhances language proficiency, communication, and academic writing skills
SDG 5	Gender Equality	Promotes inclusive and gender-sensitive communication
SDG 8	Decent Work and Economic Growth	Improves employability through communication and presentation skills
SDG 10	Reduced Inequalities	Encourages inclusive communication across diverse groups
SDG 16	Peace, Justice and Strong Institutions	Promotes ethical communication, critical thinking, and responsible expression

Code	Course Title	Credit	L-T-P
GO25001	**Basic QGIS**	**2**	**2-0-1**

Course Learning Objectives

The course aims to provide students with a basic understanding of geographic coordinates, maps, and GIS concepts. It introduces the QGIS environment and develops skills in spatial data visualization, map preparation, and basic geospatial analysis**.**

Course Outcomes

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

After successful completion of the course, students will be able to:

CO1: Understand the basic concepts of Geography, Cartography, and maps.

CO2: Explain geographic coordinates, time zones, and location determination.

CO3: Demonstrate the basic concepts and interface of GIS and QGIS.

CO4: Manage spatial data, layers, and coordinate systems in QGIS.

CO5: Prepare and export basic thematic maps using QGIS.

CO-PO-PSO Mapping

Course 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	PS O1	PS O2	PS O3	PS O4	PS O5
CO1	3	2	1	-	-	-	-	-	-	-	-	-	3	1	-	-	-
CO2	3	3	2	1	-	-	-	-	-	-	-	-	3	2	1	-	-
CO3	3	3	3	2	2	-	-	-	-	1	-	-	3	3	2	1	1
CO4	3	3	3	3	2	-	-	-	-	1	-	-	3	3	3	2	2
CO5	3	3	3	3	2	-	1	-	-	2	1	1	3	3	3	2	3
Mapping Scale:																	
1 – Low (Weakly Mapped)									2 – Medium (Moderately Mapped)								
3 – High (Strongly Mapped)									“–” No Correlation								

Course Inputs

Unit I: Introduction to Geography and Cartography

Concept and scope of Geography; Earth as a sphere; Globe and maps; Types of maps; Map elements; Scale, direction, and distance measurement; Introduction to cartography.

Unit II: Latitude, Longitude and Coordinate Systems

Concept of latitude and longitude; Equator, Prime Meridian, Tropics and Polar Circles; Geographic Coordinate System (GCS); Earth coordinate system; Determination of location using coordinates; Time zones and International Date Line.

Unit III: Fundamentals of GIS and QGIS

Introduction to Geographic Information System (GIS); Components and applications of GIS; Overview of QGIS software; QGIS interface and workspace; Creating, saving, and managing projects; Basic navigation and map visualization.

Unit IV: Spatial Data Handling in QGIS

Concept of spatial and non-spatial data; Vector data (point, line, polygon) and raster data; Adding and managing layers; Attribute tables and data editing; Coordinate Reference System (CRS); Basic map preparation and visualization.

Unit V: Practical Applications of QGIS

Measurement of distance and area; Coordinate display and location identification; Map symbolization and labeling; Preparation of thematic maps; Layout design and map export; Introduction to geospatial data sources and applications.

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

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Geospatial learning and digital skills development
SDG 9	Industry, Innovation and Infrastructure	Application of GIS and spatial technologies
SDG 11	Sustainable Cities and Communities	Mapping and spatial planning
SDG 13	Climate Action	Geospatial support for climate and environmental studies
SDG 15	Life on Land	Spatial analysis of land resources and ecosystems

SEMESTER- IV

Code	Course Title	Credit	L-T-P
GO20002	Evolution of Georgical Thought	4	3-1-0

Course Learning Objectives:

This course aims to introduce students to the evolution of geographical thought and the theoretical development of the discipline. It also provides an understanding of contemporary and postmodern perspectives, along with the major models and concepts that have shaped geographical research and practice.

Course Learning Outcomes:

On successful completion of this course the students shall enable to:
CO1: Remember the nature and scope of Geography.
CO2: Understand the contribution of ancient scholar of Geography.
CO3: Apply the ancient thoughts in modern Geography.
CO4: Analyse the qualitative and quantitative approaches in geography.
CO5: Create welfare approach in modern 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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	1	2	–	–	1	1	1	–	1	1	3	3	1	1	–
CO3	3	3	2	2	1	–	2	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	2	2	2	1	2	2	3	3	3	2	1
CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	2
Average	3	2.8	1.8	2	1	0.2	1.8	1.6	1.2	0.6	1.8	1.8	3	2.8	2	1.4	0.8
Mapping Scale:																	
1 – Low (Weakly Mapped)								3 – High (Strongly Mapped)									
2 – Medium (Moderately Mapped)								"–" No Correlation									

Course Inputs:

Unit I: Introduction to Geography and Historical Development

Meaning, nature and scope of Geography; development of geographical knowledge during the ancient and medieval periods.

Unit II: Contributions of Early Geographical Scholars

Contributions of Greek, Roman, Indian, and Arabian scholars to the development of Geography.

Unit III: Emergence of Modern Geography

Impact of explorations, discoveries, and the European Renaissance on the emergence and growth of modern Geography.

Unit IV: Foundations of Modern Geographical Thought: Contributions of German geographers (Alexander von Humboldt, Carl Ritter, Friedrich Ratzel) and French geographer (Paul Vidal de la Blache) to modern Geography.

Unit V: Major Geographers and Contemporary Indian Geography

Contributions of Bernhardus Verenius, Immanuel Kant, Alexander von Humboldt, Carl Ritter, and Richard Hartshorne; present trends in Indian Geography.

Text Book Recommended:

Hussain, M., 1989: Evolution of Geographic Thought, Rawat Publications, Jaipur.

Suggested Readings:

1. Abler, R., Adams, J. and Gould, P.P. (1971) Spatial Organization: The Geographers 'View of the World, Prentice-Hall, Englewood Cliff.
2. Adhikari, S. (2015), Fundamentals of Geographical Thought, Orient Black Swan Pvt. Ltd., New Delhi.
3. Ahmad, A. (ed), 1996: Progress in Indian Geography (1992-1996), INSA, New Delhi
4. Dikshit, R.D., 1997: Geographical Thoughts: A Contextual History of Ideas, Prentice Hall of India, New Delhi
5. https://youtu.be/FZttdl7IMXw

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Development of theoretical knowledge and critical understanding of geographical thought
SDG 9	Industry, Innovation and Infrastructure	Contribution of scientific thinking, models, and methodological development in geography
SDG 11	Sustainable Cities & Communities	Understanding spatial thinking and planning perspectives from classical to modern geography
SDG 13	Climate Action	Evolution of environmental determinism, possibilism, and human–environment interaction
SDG 15	Life on Land	Human–environment relationship and ecological perspectives in geographical thought

Code	Course Title	Credit	L-T-P
GO20004	Economic Geography	4	3-1-0

Course Learning Objectives:

This course aims to familiarize students with human adaptation to the environment, population dynamics, and contemporary global issues. It also introduces the changing patterns of economic activities and the key factors influencing economic development from a geographical perspective. In view of this, the objectives of this course are to integrate the various factors of economic development and to acquaint the students about this dynamic aspect of economic geography.

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

CO1: Remember the Nature and Scope of Economic Geography

CO2: Understand the Economic Geography

CO3: Apply the knowledge of Agricultural Activities with the help of Von Thunen Theory

CO4: Analyse the Economic dimensions in their day-to-day life.

CO5: Evaluate the Natural Resources in contest of State and Nation.

CO-PO-PSO Mapping

Program Outcomes → / Course 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	PSO 5
CO1	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	1
CO3	3	3	2	3	1	–	2	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	3	2	2	1	2	2	3	3	3	2	2

CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	2
Average	**3**	**2.8**	**2**	**2.2**	**1**	**0.2**	**2.2**	**1.6**	**1.2**	**0.6**	**1.8**	**1.8**	**3**	**2.8**	**2.2**	**1.4**	**1.2**

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

Course Inputs:

UNIT-I: Fundamentals of Economic Geography

Definition, Concept and scope of economic geography, Classification of economic activities and factors affecting their spatial organization.

UNIT-II: Primary Economic Activities

Primary activities: Types and problems and agriculture, agricultural regions of the world, forestry and fishing.

UNIT-III: Secondary Economic Activities

Secondary Activities: Manufacturing (Cotton textile, Iron and Steel), Regions of the world. Special Economic Zones and its significance.

UNIT IV: Tertiary Economic Activities

Tertiary Activities: Transport, Roads and Railways, Air and Water, Trade.

UNIT- V: Theories of Economic Geography

Von Thunen's theory and Weber's theory., Agricultural productivity and efficiency.

Text Book Recommended:

1. Hussain, M. (2003) Economic Geography, Anmol Publisher
2. Knowles, R. (1990), Economic and Social Geography Made Simple, R. Knowles, Rupa

References:

1. Bergwan, E. E. (1995), Human Geography; Culture, Connections and Landscape, Prentice-Hall, New Jerse.
2. Johnston, R.J. (editor) (1994), Dictionary of Human Geography Blackwell, Oxford
3. Alexander, (1986) Economic geography, Prentice Hall Inc. (E. E. Edition)
4. https://youtu.be/FZttdl7IMXw

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Knowledge of economic activities and spatial organization
SDG 8	Decent Work & Economic Growth	Understanding industrial and economic development
SDG 9	Industry, Innovation & Infrastructure	Study of industries and transport systems
SDG 12	Responsible Consumption & Production	Sustainable use of resources
SDG 13	Climate Action	Environmental impact of economic activities

Code	Course Title	Credit	L-T-P
GO20006	**Environmental Geography**	**4**	**3-1-0**

Course Learning Objectives:

This course introduces the concepts of environment, ecology, natural resources, biomes, environmental issues, hazards, and disasters. It helps students understand environmental conservation, resource management, and sustainable development from a geographical perspective.

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

#	Course Outcomes
CO1	Remember the concept of environmental geography, environment, ecosystem, food chain, food web, bio geo chemical cycles, carbon and nitrogen cycle.
CO2	Understand the concept of natural resources, biome and major biomes of the world, causes and consequences, signification of environmental geography.
CO3	Apply to manage environment and ecology.
CO4	Analyze to environmental impact assessment, social impact assessment.
CO5	Evaluate the perennial problems natural resources, environmental phenomenon, hazards, disasters.

CO-PO-PSO Mapping

Program Outcomes → / Course 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
CO1	3	2	–	–	–	–	2	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	2	1	–	1	1	3	3	2	1	1
CO3	3	3	2	3	2	1	3	2	1	1	2	2	3	3	2	2	2
CO4	3	3	3	3	2	1	3	2	2	1	3	2	3	3	3	2	2
CO5	3	3	3	3	2	2	3	2	2	1	3	3	3	3	3	3	3
Average	**3**	**2.8**	**2**	**2.2**	**1.2**	**0.8**	**2.6**	**1.8**	**1.2**	**0.6**	**2**	**1.8**	**3**	**2.8**	**2.2**	**1.6**	**1.6**

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

UNIT: I Environmental Geography
Meaning and definitions, Scope of environmental geography, Geography and Ecology, Human-Environment Relationships

UNIT: II Ecosystem
Meaning, concept, types and components of ecosystem, Structure and functioning of ecosystem, Trophic levels, food chains, food webs, Ecological pyramids, energy flow

UNIT: III Environmental Pollution
Environmental Pollution: definitions, pollutants and types, Air pollution, water pollution, noise pollution, Solid waste pollution, e-pollution

UNIT: IV Biomes of the World
Major Biomes of the world; tropical evergreen rainforest biome, Savanna biome, temperate grassland biome, tundra biome, Environmental Problems in Tropical, Temperate and Polar region.

UNIT: V Environmental Programmes and Policies

Global, National and Local levels , Environmental Policies, Global and National; Bio-diversity Hotspots; National Parks & Wildlife Sanctuaries

Recommended Books:

Adams,W.M.(2001) Green Development: Environment and Sustainability in the Third World, Routeledge,London
Barrow, C.J.(1999) Environment Management: Principles and Practice, Routledge, London
Barrow, C.J.(1999) Environment and Social Impact Assessment: An Introduction, Arnold, London
Barrow, C.J.(2003) Environmental Change and Human Development: Controlling Nature, Arnold, London
Barrow, C.J.(2005) Environmental Management & Development,Arnold, London
Odum, E.P.(1959) Fundamentals of Ecology, Saunders, Philadelphia
Odum, E.P.(1971) Fundamentals of Ecology, 3rd edition, W.B. Saunders, Philadelphia
Park, C.C.(1980) Ecology and Environmental Management, Butterworths, London
Zimmerer, K.S and Bassett, T.J(ed.)(2003) Political Ecology: An Integrative Approach to Geography and Environment Dvelopment Studies, Guilford Publications, New York

Text Books:

Agarwal,S.K.(2005) Environmental Management,APH Publishing Corporation, New Delhi
Nicholson, M.(1972) The Environmental Revolution, Penguin, Harmondsworth
O'Riordan,T.(1971) Perspectives of Resource Management,Pion, London
O'Riordan,T.(1995) Environmental Science for Environmental Management, Longman Scientific Technical, England
Pears, N.(1980) Basic Biogeography, Longman, London
Sinha,S. (2014) Environment Geography, Pravalika Publications, Allahabad, India

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Knowledge of environment and ecological systems
SDG 11	Sustainable Cities & Communities	Understanding hazards and disaster management

SDG 13	Climate Action	Climate-related hazards and environmental change
SDG 15	Life on Land	Ecosystem, biomes, and biodiversity conservation

Code	Course Title	Credit	L-T-P
GO20082	**Experiential Environmental Geography**	**2**	**1-0-1**

Course Learning Objectives: This course introduces students to environmental geography, ecosystems, natural resources, biomes, environmental issues, hazards, and disasters. It develops practical skills in environmental analysis, conservation, and sustainable resource management.

Course Outcomes (COs)

After successful completion of the practical course, students will be able to:

CO1: Illustrate ecosystem components, ecological succession, hydrological cycle, and major world biomes through diagrams.

CO2: Prepare maps of disaster-prone regions of the world and hazard-prone areas of India.

CO3: Analyze environmental issues at global, national, or local levels through field-based and literature-based reports.

CO4: Apply environmental and geographical knowledge to interpret ecological processes, hazards, and sustainability issues.

Course Inputs:

Unit I: Ecosystem, Environment and Biomes

- Diagrams of ecosystem, ecological succession, climax, and hydrological cycle.
- Diagrams of major world biomes: Equatorial Rainforest, Savanna, Taiga, Steppe, and Tundra.
- Submission of a report on any global environmental problem.

Unit II: Disaster Mapping and Environmental Case Study

- Preparation of maps showing disaster-prone areas of the world and hazard-prone areas of India.
- Submission of an individual report on any national or local environmental problem.

CO–PO–PSO Mapping:

Program Outcomes → / Course Outcomes ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	1	–	2	–	2	1	–	–	1	1	3	2	1	1	–
CO2	3	3	2	2	2	–	3	2	1	–	2	2	3	3	2	2	1
CO3	3	3	2	3	3	1	3	2	2	1	2	2	3	3	3	3	2
CO4	3	3	3	3	3	2	3	3	2	1	3	3	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	2	1	3	3	3	3	3	3	3
Average	2.8	2.8	2.2	2.2	2.6	1	2.8	2.2	1.4	0.6	2.2	2.2	3	2.8	2.4	2.4	1.8

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

Recommended Books:

1. Adams,W.M.(2001) Green Development: Environment and Sustainability in the Third World, Routeledge,London
2. Barrow, C.J.(1999) Environment Management: Principles and Practice, Routledge, London
3. Barrow, C.J.(1999) Environment and Social Impact Assessment: An Introduction, Arnold, London
4. Barrow, C.J.(2003) Environmental Change and Human Development: Controlling Nature, Arnold, London
5. Barrow, C.J.(2005) Environmental Management & Development, Arnold, London
6. Odum, E.P.(1959) Fundamentals of Ecology, Saunders, Philadelphia
7. Odum, E.P.(1971) Fundamentals of Ecology, 3rd edition, W.B. Saunders, Philadelphia
8. Park, C.C.(1980) Ecology and Environmental Management, Butterworths, London
9. Zimmerer, K.S and Bassett, T.J(ed.)(2003) Political Ecology: An Integrative Approach to Geography and Environment Dvelopment Studies, Guilford Publications, New York

Text Books:

1. Agarwal,S.K.(2005) Environmental Management,APH Publishing Corporation, New Delhi
2. Nicholson, M.(1972) The Environmental Revolution, Penguin, Harmondsworth
3. O'Riordan,T.(1971) Perspectives of Resource Management,Pion, London
4. O'Riordan,T.(1995) Environmental Science for Environmental Management, Longman Scientific Technical, England
5. Pears, N.(1980) Basic Biogeography, Longman, London
6. Sinha,S. (2014) Environment Geography, Pravalika Publications, Allahabad, India
7.

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Practical understanding of environmental geography, ecosystems and sustainability
SDG 6	Clean Water and Sanitation	Hydrological cycle, water conservation and sustainable water resource management
SDG 11	Sustainable Cities and Communities	Hazard mapping, disaster preparedness and resilient communities
SDG 12	Responsible Consumption and Production	Resource conservation, waste management and sustainable environmental practices
SDG 13	Climate Action	Environmental hazards, disaster mitigation and climate-related risk awareness
SDG 15	Life on Land	Biodiversity conservation, ecosystem protection and biome studies

Course Category Minor for other Discipline students

Course Code	Title	L-T-P	Total Credit
GO22002	**Geographical**	**3-1-0**	**4**

	Thought		

Course Learning Objectives:

This course aims to introduce students to the evolution of geographical thought and the theoretical development of the discipline. It also provides an understanding of contemporary and postmodern perspectives, along with the major models and concepts that have shaped geographical research and practice.

Course Learning Outcomes:

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

CO1: Remember the nature and scope of Geography.

CO2: Understand the contribution of ancient scholar of Geography.

CO3: Apply the ancient thoughts in modern Geography.

CO4: Analyse the qualitative and quantitative approaches in geography.

CO5: Create welfare approach in modern 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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	1	2	–	–	1	1	1	–	1	1	3	3	1	1	–
CO3	3	3	2	2	1	–	2	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	2	2	2	1	2	2	3	3	3	2	1
CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	2
Average	3	2.8	1.8	2	1	0.2	1.8	1.6	1.2	0.6	1.8	1.8	3	2.8	2	1.4	0.8

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

Course Inputs:

Unit I: Evolution and Scope of Geography

Concept, nature, scope, and significance of Geography; origin and evolution of geographical thought; development of geographical knowledge during the ancient and medieval periods.

Unit II: Early Traditions in Geographical Thought

Development of geographical ideas through the contributions of Greek, Roman, Indian, and Arabian scholars; their influence on the growth of geographical knowledge.

Unit III: Rise of Modern Geography

Age of exploration and discovery; influence of the Renaissance and scientific revolution on geographical thought; emergence of Geography as a modern discipline.

Unit IV: Development of Modern Geographical Thought

Contributions of Alexander von Humboldt, Carl Ritter, Friedrich Ratzel, and Paul Vidal de la Blache to the development of modern Geography; major schools of geographical thought.

Unit V: Classical and Contemporary Geographical Thought

Contributions of Immanuel Kant, Alexander von Humboldt, Carl Ritter.

Text Book Recommended:

Hussain, M., 1989: Evolution of Geographic Thought, Rawat Publications, Jaipur.

Suggested Readings:

6. Abler, R., Adams, J. and Gould, P.P. (1971) Spatial Organization: The Geographers 'View of the World, Prentice-Hall, Englewood Cliff.
7. Adhikari, S. (2015), Fundamentals of Geographical Thought, Orient Black Swan Pvt. Ltd., New Delhi.
8. Ahmad, A. (ed), 1996: Progress in Indian Geography (1992-1996), INSA, New Delhi
9. Dikshit, R.D., 1997: Geographical Thoughts: A Contextual History of Ideas, Prentice Hall of India, New Delhi
10. https://youtu.be/FZttdl7IMXw

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Development of theoretical knowledge and critical understanding of geographical thought
SDG 9	Industry, Innovation and Infrastructure	Contribution of scientific thinking, models, and methodological development in geography
SDG 11	Sustainable Cities & Communities	Understanding spatial thinking and planning perspectives from classical to modern geography
SDG 13	Climate Action	Evolution of environmental determinism, possibilism, and human–environment interaction
SDG 15	Life on Land	Human–environment relationship and ecological perspectives in geographical thought

Course Code	Course Title	Total Credit	L-T-P
AE24002	**Professional Communication**	**2**	**2-0-0**

Course Objectives:

1. Develop advanced communication skills in English.

2. Enhance vocabulary range and grammatical accuracy.

3. Improve comprehension of complex texts and spoken English.

4. Cultivate critical thinking and expression in English.

Course Learning Outcomes:

CO1- Demonstrate proficiency in professional communication, including written, oral, and digital modes suitable for business environments.

CO2- Critically assess and interpret business documents, making informed decisions to improve clarity, accuracy, and effectiveness.

CO3- Develop confidence in professional interactions, including presentations, meetings, negotiations, and group discussions.

CO-PO-PSO MAPPING

Course Input:

Unit I: Introduction to the Writing Process and Conventions of Academic Writing

Unit II: Writing in one's own words: Summarizing and Paraphrasing

Unit III: Critical Thinking: Syntheses, Analyses, and Evaluation

Unit IV: Structuring an Argument: Introduction, Interjection, and Conclusion

Recommended Learning Resources:

- Liz Hamp-Lyons and Ben Heasley, *Study writing: A Course in Writing Skills for Academic Purposes* (Cambridge: CUP, 2006).
- Renu Gupta, *A Course in Academic Writing* (New Delhi: Orient Black Swan, 2010).
- Ilona Leki, *Academic Writing: Exploring Processes and Strategies* (New York: CUP,

- 2nd edn, 1998).
- Gerald Graff and Cathy Birkenstein, *They Say/I Say: The Moves That Matter in Academic Writing* (New York: Norton, 2009).
- Graff, Gerald, and Cathy Birkenstein. *They Say / I Say: The Moves That Matter in Academic Writing*. 4th Edition, W.W. Norton, 2018.
- Cottrell, Stella. *The Study Skills Handbook*. 5th Edition, Macmillan, 2019.
- Purdue Online Writing Lab (OWL). *Paraphrasing and Summarizing*. Purdue University, 2020.
- Paul, Richard, and Linda Elder. *Critical Thinking: Tools for Taking Charge of Your Learning and Your Life*. 2nd Edition, Pearson, 2012.
- Kirkman, Thomas W. *Academic Argument: Writing, Reading, and Thinking Critically*. Longman, 2013.

SEMESTER-V
(Single Major/Double Major)

Code	Course Title	Credit	L-T-P
GO30001	**Regional Planning and Development**	**4**	**3-1-0**

Course Learning Objectives:

The course aims to introduce students to the concepts, principles, and approaches of regional planning and development. It helps students understand planning regions, regional development theories and models, regional disparities, and development programmes in India. The course also develops knowledge of Human Development Index (HDI) and promotes analytical skills for sustainable and balanced regional development.

Course Outcomes (COs)

After successful completion of the course, students will be able to:

CO1: Explain the concepts of regions and regional planning.

CO2: Identify planning regions and methods of regional delineation.

CO3: Describe major theories and models of regional development.

CO4: Analyze regional development planning, disparities, and the Human Development Index (HDI) in India.

CO5: Evaluate regional development programmes, institutions, and planning initiatives in India.

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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	1
CO3	3	3	2	3	2	–	2	2	1	1	2	2	3	3	2	2	2
CO4	3	3	3	3	2	–	2	2	2	1	2	2	3	3	3	2	2
CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	3
Average	**3**	**2.8**	**2**	**2.2**	**1.2**	**0.2**	**2**	**1.6**	**1.2**	**0.6**	**1.8**	**1.8**	**3**	**2.8**	**2.2**	**1.4**	**1.6**
Mapping Scale:																	
1 – Low (Weakly Mapped)								3 – High (Strongly Mapped)									
2 – Medium (Moderately Mapped)								"–" No Correlation									

Course Inputs

Unit-I: Concept of Region and Regional Planning

Definition of Region; Evolution and Types of Regional Planning; Formal, Functional and Planning Regions; Need for Regional Planning; Characteristics of an Ideal Planning Region.

Unit-II: Delineation and Planning Regions

Delineation of Planning Regions: Approaches and Methods; Planning Regions of India; Problems and Prospects of Regional Planning in India.

Unit-III: Theories and Models of Regional Development

Growth Pole Theory (Perroux); Theory of Unbalanced Growth; Rostow's Stages of Economic Growth.

Unit-IV: Regional Development Planning in India

Objectives, Policies and Strategies of Regional Development Planning; Rural Development Planning; Regional Disparities in India; Concept and Measurement of Human Development Index (HDI).

Unit-V: Regional Development Programmes and Institutions

Integrated Rural Development Programme (IRDP); Drought Prone Areas Programme (DPAP); Tribal Development Approaches (TDA and ITDP); Planning for Backward Regions; National Capital Region (NCR) Planning; Role of Planning Commission and NITI Aayog in Regional Development; Urban Development Programmes and Smart City Mission in India.

Text Book:

1. Chand, Mahesh and V.K Puri: Reginal Planning
2. Mishra R.P: Regional Planning, Concept Publishers, New Delhi
3. Nath, V. 2009. Regional Development and Planning in India, Concept Publishing Company.
4. Mitra, Ashok. 1961. Levels of Regional Development in India, Census of India

Reference Book:

1. Friedmann J. and Alonso W. (1975): Regional Policy- Readings in Theory and Applications, MIT Press, Massachusetts.
2. Hysnes J. 2008: Development Studies, Polity Short Introduction Series
3. Peet R., 1999: Theories of Development, The Guilford Press, Newyork
4. UNDP 2001-04: Human Development Report, Oxford University Press, New

Suggested E-Resources:

- https://www.niti.gov.in/verticals/sustainable-dev-goals
- https://www.niti.gov.in/sites/default/files/202108/India_ActionAgend a.pdf
- https://krishi.icar.gov.in/jspui/bitstream/123456789/32452/1/Treebas ed%20farming%20systems%20for%20different%20agroecosub%20r egions%20of%20Andhra%20Pradesh.pdf

SDG Mapping for this Course:

SDG No.	SDG Title	Nature of Contribution
SDG 1	No Poverty	Promotes rural and regional development strategies for poverty alleviation and balanced growth.

SDG 8	Decent Work and Economic Growth	Examines regional development models, growth centres, and economic planning for employment generation.
SDG 9	Industry, Innovation and Infrastructure	Supports regional infrastructure development and growth pole strategies for balanced regional development.
SDG 10	Reduced Inequalities	Addresses regional disparities and promotes equitable distribution of resources and opportunities.
SDG 11	Sustainable Cities and Communities	Focuses on regional planning, National Capital Region (NCR) planning, urban development programmes, and Smart City initiatives.
SDG 16	Peace, Justice and Strong Institutions	Highlights the role of planning institutions such as the Planning Commission and NITI Aayog in governance and development.

Code	Course Title	Credit	L-T-P
GO30003	**Population Geography**	**4**	**3-1-0**

Course Learning Objectives:

This course aims to provide students with an understanding of population geography, population distribution, growth, composition, and dynamics. It enables students to analyse demographic processes such as fertility, mortality, and migration, and examine contemporary population issues and their socio-economic implications.

Course Learning Outcomes

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

CO1: Remember the nature, scope and significance of Population Geography and sources of population data.

CO2: Understand population distribution, growth patterns and theories of population growth.

CO3: Apply demographic concepts related to fertility, mortality and migration in population studies.

CO4: Analyze population composition, structure and their socio-economic implications.

CO5: Evaluate contemporary population issues and population policies at regional, national and global levels.

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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	1
CO3	3	3	2	3	1	–	2	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	2	2	2	1	2	2	3	3	3	2	2
CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	3
Average	**3**	**2.8**	**2**	**2.2**	**1**	**0.2**	**2**	**1.6**	**1.2**	**0.6**	**1.8**	**1.8**	**3**	**2.8**	**2.2**	**1.4**	**1.4**

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

Course Inputs

Unit-I: Introduction to Population Geography

Nature, scope and significance of Population Geography. Sources of population data with special reference to India-Census, Vital Statistics and National Sample Survey (NSS); their uses and limitations**.**

Unit II: Population Distribution and Growth

Spatial distribution and density of population. Determinants of population distribution. Patterns and trends of population growth. Theories of population growth- Malthusian Theory and Demographic Transition Theory.

Unit III: Population Dynamics

Concept and measures of fertility, mortality and migration. Determinants influencing population dynamics and their social and economic implications

Unit IV: Population Composition and Structure

Age-sex composition and its significance. Rural and urban population composition. Literacy and its impact on socio-economic development.

Unit V: Contemporary Population Issues

Ageing population and its challenges. Declining sex ratio. Major health concerns including HIV/AIDS. Emerging population problems and policy perspectives.

Text Book:

Chandna R. C. and Sidhu M. S., 1980: An Introduction to Population Geography, Kalyani Publishers.

Reading List:

1. Barrett H. R., 1995: Population Geography, Oliver and Boyd.
2. Bhende A. and Kanitkar T., 2000: Principles of Population Studies, Himalaya Publishing House.
3. Clarke J. I., 1965: Population Geography, Pergamon Press, Oxford.
4. Jones H. R., 2000: Population Geography, 3rd ed. Paul Chapman, London.
5. Lutz W., Warren C. S. and Scherbov S., 2004: The End of the World Population Growth in the 21st Century, Earthscan.
6. Newbold K. B., 2009: Population Geography: Tools and Issues, Rowman and Littlefield Publishers.
7. Pacione M., 1986: Population Geography: Progress and Prospect, Taylor and Francis.
8. Wilson M. G. A., 1968: Population Geography, Nelson.
9. Panda B. P. (1988): Janasankya Bhugol, M P Hindi Granth Academy, Bhopal.
10. Maurya S D (2009): Jansankya Bhugol, Sharda Putak Bhawan, Allahabad.

Chandna R C (2006): Jansankhya Bhugol, Kalyani Publishers, Delhi

E-References:

- Swayam: https://onlinecourses.swayam2.ac.in/e-learning/preview/ini26_hs39
- EGyankosh: https://egyankosh.ac.in/handle/123456789/100008

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-being	Understanding population health, ageing, mortality, HIV/AIDS and public health issues.
SDG 4	Quality Education	Promoting demographic literacy and analysis of population data for informed decision-making.
SDG 5	Gender Equality	Examining sex ratio, gender disparities, women's status and empowerment.
SDG 10	Reduced Inequalities	Understanding population inequalities and promoting inclusive development.
SDG 11	Sustainable Cities and Communities	Addressing urban population growth, urbanization and sustainable settlement planning.
SDG 17	Partnerships for the Goals	Utilizing census and demographic data for evidence-based planning and policy formulation.

Code	Course Title	Credit	L-T-P
GO30005	**Geography of India**	**4**	**3-1-0**

Course Objectives:

This course aims to provide students with a comprehensive understanding of the physical, demographic, agricultural, mineral, energy, and industrial characteristics of India. It enables students to analyse regional variations in natural resources, population distribution, agriculture, and industrial development, and their role in the economic development of the country.

Course Outcomes (COs)

After successful completion of the course, students will be able to:
CO1: Explain the physical environment and natural resources of India.
CO2: Describe the distribution and characteristics of India's population.
CO3: Analyse the distribution and importance of mineral and energy resources.
CO4: Examine agricultural development and regional patterns in India.
CO5: Evaluate industrial development and the significance of ecotourism in India.

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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	1
CO3	3	3	2	3	1	–	2	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	2	2	2	1	2	2	3	3	3	2	2
CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	3
Average	**3**	**2.8**	**2**	**2.2**	**1**	**0.2**	**2**	**1.6**	**1.2**	**0.6**	**1.8**	**1.8**	**3**	**2.8**	**2.2**	**1.4**	**1.4**

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

Course Inputs

Unit I: Physical Environment of India

Physiographic divisions of India and their characteristics. Distribution and types of soils and natural vegetation. Climate of India; major characteristics, controlling factors and classification**.**

Unit II: Population Characteristics

Spatial distribution of population in India. Demographic structure including age, sex and occupational composition. Trends and patterns of population growth and their implications.

Unit III: Mineral and Energy Resources

Distribution and utilization of major minerals such as iron ore, coal, petroleum and natural gas. Importance of mineral and power resources in economic development.

Unit IV: Agriculture and Development

Agricultural production and regional distribution of India, Green Revolution, Agricultural Development in India during the Plan Periods.

UNIT-V Industrial Development and Ecotourism

Factors Influencing the Location of Industries, Classification of Industries and Ecotourism: Concept, Principles, and Significance

Text Book

1. Sharma, T.C. (2013): *Economic Geography of India*, Rawat Publication, Jaipur
2. Khullar, D. R.: *India: A Comprehensive Geography*

Reference Book

1. Deshpande C. D., 1992: *India: A Regional Interpretation*, ICSSR, New Delhi
2. Mandal R. B. (ed.), 1990: *Patterns of Regional Geography – An International Perspective, Vol. 3 – Indian Perspective*
3. Sharma, T. C., 2003: *India – Economic and Commercial Geography*, Vikas Publishing, New Delhi
4. Singh R. L., 1971: *India: A Regional Geography*, National Geographical Society of India
5. Singh, Jagdish, 2003: *India – A Comprehensive & Systematic Geography*, Gyanodaya Prakashan, Gorakhpur
6. Spate O. H. K. and Learmonth A. T. A., 1967: *India and Pakistan: A General and Regional Geography*, Methuen

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 2	Zero Hunger	Understanding agricultural development, food production and food security in India.
SDG 7	Affordable and Clean Energy	Study of energy resources including coal, petroleum, natural gas and power resources.
SDG 8	Decent Work and Economic Growth	Analysis of industrial development, economic activities and employment generation.

SDG 9	Industry, Innovation and Infrastructure	Understanding industrial location, manufacturing industries and infrastructure development.
SDG 11	Sustainable Cities and Communities	Population distribution, urbanization and regional development issues.
SDG 12	Responsible Consumption and Production	Sustainable utilization of mineral, agricultural and industrial resources.
SDG 13	Climate Action	Understanding climatic characteristics, environmental challenges and adaptation strategies.

Code	Course Title	Credit	L-T-P
GO30007	**Statistical Methods in Geography**	**4**	**3-1-0**

Course Learning Objectives:

This course aims to introduce students to the concepts, types, sources, and measurement of geographical data. It enables students to apply statistical techniques such as data tabulation, measures of central tendency, dispersion, correlation, and regression for geographical analysis and interpretation of spatial patterns and relationships.

Course Learning Outcomes

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

CO1: Remember the concepts, types, sources, and measurement scales of geographical data.

CO2: Understand methods of data tabulation, presentation, and descriptive statistical techniques used in geographical studies.

CO3: Apply measures of central tendency, dispersion, and sampling techniques in geographical data analysis.

CO4: Analyse relationships among geographical variables using correlation and regression techniques.

CO5: Evaluate the application of statistical methods in geographical research and spatial analysis.

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	3	2	1	1	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	1	–	2	1	1	–	2	1	3	3	2	1	1
CO3	3	3	2	3	2	–	2	2	1	1	2	2	3	3	2	2	2
CO4	3	3	3	3	3	1	2	2	2	1	3	2	3	3	3	2	2
CO5	3	3	3	3	3	2	3	2	2	1	3	3	3	3	3	3	3
Average	**3**	**2.8**	**2.2**	**2.4**	**1.8**	**0.6**	**2**	**1.6**	**1.2**	**0.6**	**2.2**	**1.8**	**3**	**2.8**	**2.2**	**1.6**	**1.6**

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

Course Inputs:

Unit I: Data and Measurement in Geography

Concept and importance of data in geographical studies. Types and sources of geographical data. Construction of geographical data matrix. Scales of measurement, Nominal, Ordinal, Interval and Ratio, and their applications in geographical analysis.

Unit II: Tabulation and Descriptive Statistics

Methods of data tabulation and presentation. Frequency distribution and its types. Measures of central tendency, mean, median and mode, their calculation and significance in geographical studies.

Unit III: Measures of Dispersion

Concept and importance of dispersion in data analysis. Measures of dispersion including mean deviation, standard deviation and variance. Coefficient of variation and its role in comparing variability.

Unit IV: Correlation and Regression Analysis: Concept of association and correlation in geographical data. Methods of measuring correlation-Rank correlation and product moment correlation. Introduction to simple linear regression and its application in geographical analysis.

Unit V: Spatial Analysis and Statistical Applications in Geography

Sampling Techniques and Sampling Design. Time Series Analysis: Trend and Growth Rate. Application of Statistical Methods in Geographical Research. Use of Statistical Techniques in Population, Agricultural, Environmental and Regional Studies.

Each student will submit a record containing five exercises:

1. Tabular and graphical representation of frequency distribution
2. Exercises on mean, median and mode in grouped data
3. Exercises on drawing of scatter diagram, correlation and regression

Text Book

1. Mahmood A., 1977: *Statistical Methods in Geographical Studies*, Concept
2. Sarkar A. (2013): *Quantitative Geography: Techniques and Presentations*, Orient Black Swan Pvt. Ltd., New Delhi

Reference Book

1. Hammond P. and McCullagh P. S., 1978: *Quantitative Techniques in Geography: An Introduction*, Oxford University Press
2. Yeates M., 1974: *An Introduction to Quantitative Analysis in Human Geography*, McGraw Hill, New York
3. Silk J., 1979: *Statistical Concepts in Geography*, Allen and Unwin, London
4. King L. S., 1969: *Statistical Analysis in Geography*, Prentice-Hall
5. Pal S. K., 1998: *Statistics for Geoscientists*, Tata McGraw Hill, New Delhi
6. Ebdon D., 1977: *Statistics in Geography: A Practical Approach*

E-Resources Links

- e-PG Pathshala: https://epgp.inflibnet.ac.in
- SWAYAM: https://swayam.gov.in
- NDLI: https://ndl.iitkgp.ac.in
- NPTEL: https://nptel.ac.in
- Census of India: https://censusindia.gov.in

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution

SDG 4	Quality Education	Promotes quantitative skills, statistical literacy and research competence in geography.
SDG 9	Industry, Innovation and Infrastructure	Supports data analysis, innovation and evidence-based planning through statistical methods.
SDG 11	Sustainable Cities and Communities	Facilitates spatial analysis and interpretation of urban and regional datasets.
SDG 13	Climate Action	Enables statistical assessment of environmental and climate-related geographical phenomena.
SDG 15	Life on Land	Assists in the analysis of environmental and ecological datasets for sustainable resource management.
SDG 17	Partnerships for the Goals	Encourages the use of data, indicators and statistical evidence for planning and policy formulation.

Code	Course Title	Credit	L-T-P
GO32001	**Regional Geography of India**	**4**	**3-1-0**

Course Learning Objectives:

This course aims to provide students with a comprehensive understanding of the physical, demographic, agricultural, mineral, energy, and industrial characteristics of India. It enables students to analyse regional variations in natural resources, population distribution, agriculture, and industrial development, and their role in the economic development of the country.

Course Outcomes (COs)
After successful completion of the course, students will be able to:
CO1: Explain the physical environment and natural resources of India.
CO2: Describe the distribution and characteristics of India's population.
CO3: Analyze the distribution and importance of mineral and energy resources.
CO4: Examine agricultural development and regional patterns in India.
CO5: Evaluate industrial development and the significance of ecotourism in India.

CO–PO–PSO Mapping

Program Outcomes →	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**

Course Outcomes ↓																	
CO1	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	1
CO3	3	3	2	3	1	–	2	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	2	2	2	1	2	2	3	3	3	2	2
CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	3
Average	**3**	**2.8**	**2**	**2.2**	**1**	**0.2**	**2**	**1.6**	**1.2**	**0.6**	**1.8**	**1.8**	**3**	**2.8**	**2.2**	**1.4**	**1.4**

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

Course Inputs

Unit I: Physical Environment of India

Physiographic divisions of India and their characteristics. Distribution and types of soils and natural vegetation. Climate of India; major characteristics.

Unit II: Population Characteristics

Spatial distribution of population in India. Demographic structure including age, sex and occupational composition.

Unit III: Mineral and Energy Resources

Concept and classification of mineral and energy resources; types of minerals; conventional and non-conventional sources of energy; major mineral and energy resources of India

Unit IV: Agricultural Production

Agricultural production and regional distribution of India, Green Revolution, White Revolution

UNIT-V Tourism in India

Concept and significance of tourism; types of tourism in India; ecotourism-concept, importance, and major ecotourism destinations in India.

Text Book

3. Sharma, T.C. (2013): *Economic Geography of India*, Rawat Publication, Jaipur
4. Khullar, D. R.: *India: A Comprehensive Geography*

Reference Book

7. Deshpande C. D., 1992: *India: A Regional Interpretation*, ICSSR, New Delhi
8. Mandal R. B. (ed.), 1990: *Patterns of Regional Geography – An International Perspective, Vol. 3 – Indian Perspective*
9. Sharma, T. C., 2003: *India – Economic and Commercial Geography*, Vikas Publishing, New Delhi
10. Singh R. L., 1971: *India: A Regional Geography*, National Geographical Society of India
11. Singh, Jagdish, 2003: *India – A Comprehensive & Systematic Geography*, Gyanodaya Prakashan, Gorakhpur
12. Spate O. H. K. and Learmonth A. T. A., 1967: *India and Pakistan: A General and Regional Geography*, Methuen

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 2	Zero Hunger	Promotes knowledge of agriculture and food security.
SDG 4	Quality Education	Develops understanding of India's geography and resources.
SDG 7	Affordable and Clean Energy	Introduces conventional and renewable energy resources.
SDG 12	Responsible Consumption and Production	Encourages sustainable use of natural resources.
SDG 13	Climate Action	Creates awareness of climate and environmental challenges.
SDG 15	Life on Land	Promotes conservation of soils, forests, and ecosystems.

Code	Course Title	Credit	L-T-P
GO32003	**Demographic Geography**	**4**	**3-1-0**

Course Objectives

This course aims to provide students with a comprehensive understanding of the concepts, theories, and patterns of population geography. It familiarizes students with population data sources, demographic

processes, population composition, and contemporary population issues, enabling them to analyse population dynamics and their implications for regional and national development.

Course Outcomes (COs)

CO1: Explain the nature, scope, and significance of Population Geography and interpret major sources of population data in India.

CO2: Analyze the patterns, determinants, and theories of population growth and distribution.

CO3: Evaluate the demographic processes of fertility, mortality, and migration and their implications for society and development.

CO4: Examine the demographic characteristics of population, including age-sex composition, rural–urban distribution, and literacy.

CO5: Assess contemporary population issues such as population ageing, declining sex ratio, HIV/AIDS, and other emerging demographic challenges in India.

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	3	2	–	–	–	–	1	1	–	–	1	1	3	2	1	–	–
CO2	3	3	2	2	–	–	2	1	1	–	1	1	3	3	2	1	1
CO3	3	3	2	3	1	–	2	2	1	1	2	2	3	3	2	2	1
CO4	3	3	3	3	2	–	2	2	2	1	2	2	3	3	3	2	2
CO5	3	3	3	3	2	1	3	2	2	1	3	3	3	3	3	2	3
Average	**3**	**2.8**	**2**	**2.2**	**1**	**0.2**	**2**	**1.6**	**1.2**	**0.6**	**1.8**	**1.8**	**3**	**2.8**	**2.2**	**1.4**	**1.4**

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

Course Input

Unit I: Introduction to Population Geography

Nature and scope of Population Geography; sources of population data with special reference to India, including Census, Vital Statistics and National Sample Survey (NSS).

Unit II: Population Growth and Distribution

Population size, distribution and growth; determinants and patterns of population growth; Malthusian Theory and Demographic Transition Theory.

Unit III: Population Dynamics

Concept, measures, determinants and implications of fertility, mortality and migration.

Unit IV: Population Composition

Age-sex composition, rural and urban population composition, and literacy as major demographic characteristics.

Unit V: Contemporary Population Issues

Ageing of population, declining sex ratio, HIV/AIDS, and emerging population challenges in India.

Text Book:

Chandna R. C. and Sidhu M. S., 1980: An Introduction to Population Geography, Kalyani Publishers.

Reading List:

11. Barrett H. R., 1995: Population Geography, Oliver and Boyd.
12. Bhende A. and Kanitkar T., 2000: Principles of Population Studies, Himalaya Publishing House.
13. Clarke J. I., 1965: Population Geography, Pergamon Press, Oxford.
14. Jones H. R., 2000: Population Geography, 3rd ed. Paul Chapman, London.
15. Lutz W., Warren C. S. and Scherbov S., 2004: The End of the World Population Growth in the 21st Century, Earthscan.
16. Newbold K. B., 2009: Population Geography: Tools and Issues, Rowman and Littlefield Publishers.
17. Pacione M., 1986: Population Geography: Progress and Prospect, Taylor and Francis.
18. Wilson M. G. A., 1968: Population Geography, Nelson.
19. Panda B. P. (1988): Janasankya Bhugol, M P Hindi Granth Academy, Bhopal.
20. Maurya S D (2009): Jansankya Bhugol, Sharda Putak Bhawan, Allahabad.

Chandna R C (2006): Jansankhya Bhugol, Kalyani Publishers, Delhi

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-being	Understanding population health, ageing, mortality, HIV/AIDS and public health issues.
SDG 4	Quality Education	Promoting demographic literacy and analysis of population data for informed decision-making.
SDG 5	Gender Equality	Examining sex ratio, gender disparities, women's status and empowerment.
SDG 10	Reduced Inequalities	Understanding population inequalities and promoting inclusive development.
SDG 11	Sustainable Cities and Communities	Addressing urban population growth, urbanization and sustainable settlement planning.
SDG 17	Partnerships for the Goals	Utilizing census and demographic data for evidence-based planning and policy formulation.

Code	Course Title	Credit	L-T-P
GO32005	**Fundamental of Statistics**	**4**	**3-0-1**

Course Objectives

This course aims to introduce students to the basic concepts and methods of statistics used in geographical studies. It enables students to collect, organize, analyse, and interpret quantitative data for geographical research and decision-making.

Course Outcomes (COs)

CO1: Explain the fundamental concepts, scope, and applications of statistics in geographical studies.

CO2: Collect, classify, tabulate, and present statistical data using appropriate tables, diagrams, and graphs.

CO3: Compute and interpret measures of central tendency for geographical data.

CO4: Analyze the variability of data using different measures of dispersion.

CO5: Apply correlation and simple regression techniques to examine relationships between geographical variables.

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	2	1	–	1	–	–	1	2	2	3	1	–	1
CO3	2	3	2	3	2	1	–	–	1	–	1	2	2	3	2	–	1

CO4	2	3	2	3	2	1	–	–	1	–	1	2	2	3	2	1	1
CO5	2	3	3	3	3	2	1	1	2	1	2	2	3	3	3	2	2
Average	**2.2**	**2.8**	**2**	**2.8**	**2**	**1.2**	**1**	**1**	**1.3**	**1**	**1.2**	**2**	**2.4**	**2.6**	**2**	**1.5**	**1.3**

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

Unit I: Introduction to Statistics

Meaning, nature and scope of statistics; importance of statistics in geography; types of data; sources of data; collection of primary and secondary data; classification and tabulation of data.

Unit II: Data Presentation

Frequency distribution; diagrammatic and graphical presentation of data; bar diagrams, pie charts, histograms, frequency polygons and ogives.

Unit III: Measures of Central Tendency

Concept and computation of arithmetic mean, median and mode; merits, demerits and applications.

Unit IV: Measures of Dispersion

Range, quartile deviation, mean deviation, standard deviation and coefficient of variation; significance and applications.

Unit V: Correlation and Regression

Concept and types of correlation; Karl Pearson's coefficient of correlation; simple linear regression; interpretation and applications in geographical studies.

Text Books

1. Gupta, S. P. (2022). *Statistical Methods*. Sultan Chand & Sons, New Delhi.
2. Kapoor, V. K. (2021). *Fundamentals of Applied Statistics*. Sultan Chand & Sons, New Delhi.
3. Croxton, F. E., Cowden, D. J., & Klein, S. (2019). *Applied General Statistics*. Prentice Hall of India, New Delhi.
4. Spiegel, M. R., Schiller, J., & Srinivasan, R. A. (2018). *Schaum's Outline of Statistics* (5th ed.). McGraw-Hill Education.
5. Gregory, S. (2014). *Statistical Methods and the Geographer* (4th ed.). Sage Publications.

Reference Books

1. Rogerson, P. A. (2019). *Statistical Methods for Geography: A Student's Guide* (4th ed.). Sage Publications.
2. Ebdon, D. (2018). *Statistics in Geography* (2nd ed.). Wiley-Blackwell.
3. Hammond, R., & McCullagh, P. S. (2016). *Quantitative Techniques in Geography: An Introduction*. Oxford University Press.
4. Walford, N. (2011). *Practical Statistics for Geographers and Earth Scientists*. Wiley-Blackwell.
5. King, L. J. (2013). *Statistical Analysis in Geography*. Prentice Hall.

E- Reference: https://onlinecourses.nptel.ac.in/e-learning/preview/noc24_ma30

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Develops statistical knowledge, quantitative reasoning, and data analysis skills for academic and professional excellence.
SDG 9	Industry, Innovation and Infrastructure	Promotes the use of statistical techniques for research, innovation, and evidence-based decision-making.
SDG 11	Sustainable Cities and Communities	Facilitates the analysis of population, urban, and environmental data to support sustainable planning.
SDG 13	Climate Action	Enables statistical analysis of climate and environmental data for disaster risk reduction and climate resilience.
SDG 17	Partnerships for the Goals	Strengthens data literacy and statistical capacity for monitoring, evaluating, and achieving sustainable development goals.

Code	Course Title	Credit	L-T-P
GO32007	**Tourism Geography**	**4**	**3-1-0**

Course Objectives: This course aims to introduce students to the concepts, principles, and significance of tourism geography. It enables learners to understand tourism resources, tourism development, impacts of tourism, and sustainable tourism practices with special reference to India.

Course Outcomes (COs)

CO1: Explain the concepts, scope, and significance of Tourism Geography.

CO2: Identify and evaluate various natural and cultural tourism resources and their tourism potential.

CO3: Understand the role of tourism infrastructure, transport, and planning in tourism development.

CO4: Assess the economic, socio-cultural, and environmental impacts of tourism.

CO5: Apply the principles of sustainable and responsible tourism for balanced regional development.

Program Outcomes → / Course 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
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	2	2	1	1	–	1	–	1	2	3	2	1	1	–
CO3	2	3	2	3	2	2	1	1	1	1	1	2	2	3	2	1	1
CO4	2	2	3	3	2	2	2	1	2	1	2	2	2	2	3	2	1
CO5	2	3	3	3	3	2	2	2	2	2	2	3	3	3	3	2	2
Average	**2.2**	**2.6**	**2.2**	**2.6**	**2**	**1.6**	**1.5**	**1.3**	**1.5**	**1.3**	**1.4**	**2.2**	**2.6**	**2.2**	**2.3**	**1.5**	**1.3**

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

Course Inputs:

Unit I: Introduction to Tourism Geography

Nature, scope and significance of Tourism Geography; concepts of tourism, tourist and recreation; types of tourism; factors influencing tourism development.

Unit II: Tourism Resources

Natural and cultural tourism resources; heritage tourism; religious tourism; eco-tourism; adventure tourism; tourism potential of India.

Unit III: Tourism Infrastructure and Planning

Tourism infrastructure and amenities; transport and accommodation; travel agencies and tour operators; tourism planning and development.

Unit IV: Impacts of Tourism

Economic, social, cultural and environmental impacts of tourism; carrying capacity; community participation in tourism development.

Unit V: Sustainable Tourism

Concept and principles of sustainable tourism; responsible tourism; ecotourism; tourism policies in India; emerging trends and challenges in tourism.

Text Books

1. Bhatia, A. K. (2021). *Tourism Development: Principles and Practices*. Sterling Publishers, New Delhi.
2. Robinson, H. (2018). *Geography of Tourism*. Macdonald and Evans, London.
3. Singh, S. (2017). *Tourism Geography*. Rawat Publications, Jaipur.

Reference Books

1. Hall, C. M., & Page, S. J. (2021). *The Geography of Tourism and Recreation: Environment, Place and Space* (5th ed.). Routledge.
2. Page, S. J. (2019). *Tourism Management* (6th ed.). Routledge.
3. Inskeep, E. (2017). *Tourism Planning: An Integrated and Sustainable Development Approach*. John Wiley & Sons.

E- Reference: https://onlinecourses.swayam2.ac.in/e-learning/preview/cec19_hs09

SDG Mapping for this Course:

SDG No.	SDG Title	Nature of Contribution
SDG 8	Decent Work and Economic Growth	Promotes tourism-based employment and economic growth.
SDG 11	Sustainable Cities and Communities	Supports sustainable tourism and heritage conservation.
SDG 12	Responsible Consumption and Production	Encourages responsible and sustainable tourism practices.
SDG 13	Climate Action	Promotes climate-conscious tourism and environmental awareness.

Code	Course Title	Credit	L – T – P
IP37081	**Internship**	**2**	**0-0-2**

Course Objectives:

To enable students to acquire practical knowledge and to act professionally in this area. This is meant to provide a scope to the students to apply theoretical knowledge in the real world, explore further in-depth knowledge in Tribal Resource Management.

Course Learning Outcomes:

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 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.

Preamble:

The Summer Internship is a fully practical oriented course which has been designed to give students in depth knowledge about. Summer Internship is designed at the end of first year, where in student would have studied the courses in resource management and will have more scope to apply knowledge. In this subject, wherein he will be encouraged to explore concepts already dealt in the class and understand its application in the field. The student while carrying summer internship training Project is more focused and would be getting continuous guidance from the external as well as internal experts. The following note presents the broad guidelines of the Project.

PROCESS / GUIDELINES:

1) The student will be required to undergo a field placement for a total duration of 4-6 weeks in their chosen area of interest. Or institute will depute the students to various organizations looking at their area of interest.

2) In case the student makes the choice of the organization, it has to be made in consultation with the Institute. The Institute for this purpose should assign an internal faculty member who will act as the mentor throughout the Project. The assignment of mentor and choice of project should be made.

3) The study conducted by the student will be a full-time effort.

4) The proposal for the Summer Project or title of the project should be submitted to the Institute, which will ensure the registration of students for Project.

Students should prepare these proposals in consultation with the Internal and External Guide.

5) Students should send Joining Report on the first day of the joining which should be duly signed by the external guide.

6) Student should also send weekly reports every week keeping posted about the work –in – progress regarding project to the institute.

7) The format for the proposal or deciding about project title is as given below:

1. Title of the study
2. Need for the study (Stress on Need for study-current trends in the area)
3. A review of earlier research studies conducted
4. Objectives of the study
5. Methodology
6. Proposed outcomes and benefits of the study

8) The project should complete in time. Late submissions should not be entertained. A soft copy of all reports is to be submitted to Department on or before the submission date.

9) There shall be 2 copies of project reports along with soft copy to be submitted by each student to the School.

10) There will be a project viva-voice conducted by the University.

Deliverables:

The students are required to deliver the following Deliverables.

1) Joining Report and deciding project title/ proposal

2) Submission of project report (Soft copy + Hard copy- 2no.s /Project)

3) Presentation (for organization and the Institute)

4) Presentation for Viva-voce examination to be conducted by the University.

5) Student to present 1(One) copy to the organization and get the Certificate.

Format for Project Reports

The format for the Major Concurrent Project reports should be in the following manner.

1. Executive Summary
2. About the organization – Brief
3. Certificate of Completion
4. Introduction of the study
5. Objectives
6. Analysis and Findings
7. Discussion
8. Conclusion
9. References

In certain cases, students may change the format in consultation with his mentor and the External Guide. Enough care should be taken that the Project report focuses the study undertaken by the student and its findings. The report should contain minimum 25 pages with the following styles:

i) A-4 size paper (Executive Bond)

ii) MS Word style with Times New Roman Font

iii) Font size -12 for Text and 14 for headings

iv) Paper settings with 1-inch margins on all the four sides.

SEMESTER-VI (Single Major/Double Major)

Code	Course Title	Credit	L-T-P
GO30002	**Climate Resilience and Disaster Risk Management**	**4**	**3-1-0**

Course Learning Objectives

The course aims to develop students' understanding of climate change, hazards, disaster risk, and resilience-based approaches to disaster risk management. It familiarizes students with climate adaptation strategies, disaster preparedness, institutional frameworks, and the application of geospatial technologies for building resilient and sustainable communities.

After successful completion of the course, students will be able to:

CO1: Explain the concepts, types, and characteristics of hazards and disasters.

CO2: Describe the disaster management cycle and disaster risk reduction strategies.

CO3: Analyse the causes, impacts, and risks associated with natural and man-made hazards.

CO4: Examine the role of disaster management institutions and community preparedness in disaster response and recovery.

CO5: Apply geospatial technologies and resilience-based approaches in disaster risk assessment and mitigation planning

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	PS O1	PS O2	PS O3	PS O4	PS O5

Course Outcomes ↓																	
CO1	3	2	1	1	–	–	2	1	–	–	1	1	3	2	1	–	1
CO2	3	3	2	2	1	–	2	2	1	1	2	2	3	3	2	1	2
CO3	3	3	3	3	2	–	3	2	2	1	2	2	3	3	3	2	2
CO4	3	3	2	3	2	1	3	2	2	2	3	3	3	3	3	2	3
CO5	3	3	3	3	3	2	3	3	2	2	3	3	3	3	3	3	3
Average	3	2.8	2.2	2.4	1.6	0.6	2.6	2	1.4	1.2	2.2	2.2	3	2.8	2.4	1.6	2.2
Mapping Scale:																	
1 – Low (Weakly Mapped)								3 – High (Strongly Mapped)									
2 – Medium (Moderately Mapped)								"–" No Correlation									

Course Inputs

Unit I: Fundamentals of Climate Resilience and Disaster Risk

Concept and definition of climate resilience, hazards and disasters. Classification of hazards into natural and man-made types. Understanding vulnerability and risk, and their interrelationship. Introduction to the concept, objectives and importance of disaster management.

Unit II: Disaster Management Cycle

Phases of disaster management-pre-disaster, during disaster and post-disaster stages. Strategies for disaster risk reduction including prevention, mitigation, preparedness and adaptation. Importance of planning and early warning systems.

Unit III: Climate-Induced and Human-Induced Hazards

Detailed study of major natural hazards such as floods, cyclones, droughts and earthquakes-their causes, characteristics and impacts. Study of man-made hazards including industrial accidents and fire hazards, along with their consequences.

Unit IV: Institutional Framework and Community Resilience

Community-based and indigenous approaches to disaster preparedness. Role and functions of major disaster management institutions such as NDMA, NIDM, NDRF, OSDMA and ODRAF. Structure of disaster management system in India. Role of NGOs and government organizations in disaster response and recovery.

Unit V: Geospatial Technology and Climate Resilience in Disaster Management

Application of Remote Sensing, Geographic Information Systems (GIS), Disaster risk assessment and climate change adaptation.

Text Book

1. Singh, Savindra (2009): *Disaster Management*

Reference Books

1. Mishra B. J.: *Natural Hazards and Disaster Management*
2. Sundar I. & Sezuiyan T.: *Disaster Management*
3. Verma: *Encyclopedia of Disaster Management*
4. Eye Publication: *Vulnerable India*
5. Sinha A.: *Disaster Management*, United Press
6. Singh R. B.: *Risk Assessment and Vulnerability Analysis*

SDG Goals for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-being	Promotes disaster preparedness, climate resilience, emergency response, and reduction of disaster-related health risks.
SDG 9	Industry, Innovation and Infrastructure	Encourages resilient infrastructure, geospatial technologies, early warning systems, and innovation for disaster risk management.
SDG 11	Sustainable Cities and Communities	Develops knowledge of hazard mapping, disaster risk reduction, community resilience, and sustainable urban and rural planning.
SDG 13	Climate Action	Enhances understanding of climate change adaptation, disaster risk assessment, hazard mitigation, and climate-resilient development.
SDG 15	Life on Land	Promotes environmental conservation, sustainable land management, and mitigation of disaster impacts on terrestrial ecosystems.
SDG 17	Partnerships for the Goals	Strengthens collaboration among government agencies, disaster management institutions, NGOs, and local communities for effective disaster response and resilience building.

Code	Course Title	Credit	L-T-P

GO30004	Urban Geography	4	3-1-0

Course Learning Objectives

The course aims to provide students with an understanding of the concepts, growth, and spatial organization of urban settlements. It also familiarizes them with urban morphology, functional classification of cities, urban issues, and the application of geographical concepts in analysing urban development and planning.

Course Outcomes (COs)

After successful completion of the course, students will be able to:

CO1: Explain the concepts, evolution, scope, and characteristics of urban settlements.

CO2: Describe urban morphology, patterns of urbanization, and theories of urban development, particularly Central Place Theory.

CO3: Analyse the functional classification of cities, urban sphere of influence, and the concept of Umland.

CO4: Examine major urban problems such as housing, slums, transport, pollution, and civic amenities.

CO5: Evaluate the land use patterns and urban issues of major Indian cities through case studies.

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

CO2	3	3	2	2	1	–	2	2	1	1	2	1	3	3	2	1	2
CO3	3	3	3	3	2	–	3	2	2	1	2	2	3	3	3	2	2
CO4	3	3	2	3	2	1	3	2	2	2	3	2	3	3	3	2	2
CO5	3	3	3	3	3	2	3	3	2	2	3	3	3	3	3	3	3
Average	**3**	**2.8**	**2.2**	**2.4**	**1.6**	**0.6**	**2.6**	**2**	**1.4**	**1.2**	**2.2**	**1.8**	**3**	**2.8**	**2.4**	**1.6**	**2**

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

Course Inputs

Unit I: Introduction to Urban Geography

Urban geography: meaning, nature and scope. Origin and Evolution. Concept of urban settlements and their characteristics.

Unit II: Urban Morphology and Urbanization Patterns

Urban morphology: concept and elements. Trends and patterns of urbanization in developed and developing countries. Central Place Theory by Walter Christaller.

Unit III: Functional Classification

Functional classification of cities: quantitative and qualitative methods. Concept of Umland. Urban morphology and urban sphere of influence.

Unit IV: Urban Issues: Major urban issues: housing problems, slums, civic amenities (water supply and transport), air pollution and noise pollution.

Unit V: Case Studies of Major Indian Cities

Detailed case studies of Delhi, NCR, Mumbai, Kolkata, Chennai, Bhubaneswar and Chandigarh with reference to land use patterns and urban issues

Text books

1. Ramachandran R (1989): Urbanisation and Urban Systems of India, Oxford University Press, New Delhi

Reading List:

1. Hall T., 2006: Urban Geography, Taylor and Francis.
2. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
3. Knox P. L. and McCarthy L., 2005: Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall New York.
4. Knox P. L. and Pinch S., 2006: Urban Social Geography: An Introduction, Prentice-Hall
5. Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
6. Sassen S., 2001: The Global City: New York, London and Tokyo, Princeton University Press.
7. Ramachandran, R., 1992: The Study of Urbanisation, Oxford University Press, Delhi
8. Singh, R.B. (Ed.) (2015) Urban development, challenges, risks and resilience in Asian megacities. Advances in Geographical and Environmental Studies, Springer.
9. Kaplan, D. H., & Holloway, S. R. (2024). *Urban geography* (5th ed.). Wiley.
10. McFarlane, C. (2025). Urban geography I: Conceptualising the urban. *Progress in Human Geography*. https://doi.org/10.1177/03091325241295294
11. United Nations. (2023). *World urbanization prospects 2023*. United Nations.
12. Angel, S., Parent, J., Civco, D. L., & Blei, A. (2024). *Atlas of urban expansion*. Lincoln Institute of Land Policy.
13. Gandy, M. (2024). Urban political ecology and the future of cities. *International Journal of Urban and Regional Research*.

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 6	Clean Water and Sanitation	Promotes understanding of urban water supply, sanitation systems, and sustainable management of civic amenities.
SDG 9	Industry, Innovation and Infrastructure	Develops knowledge of urban infrastructure, transport systems, and sustainable urban planning.
SDG 11	Sustainable Cities and Communities	Focuses on sustainable urbanization, housing, slum improvement, land-use planning, and resilient urban development.
SDG 13	Climate Action	Addresses urban environmental issues, pollution control, and climate-resilient urban planning.

SDG 15	Life on Land	Encourages sustainable land use, urban ecosystem conservation, and environmentally responsible urban expansion.

Code	Course Title	Credit	L-T-P
GO30006	**Agricultural Geography**	**4**	**3-1-0**

Course Learning Objectives

This course aims to develop students' understanding of the concepts, principles, and patterns of agricultural geography, enabling them to analyze the physical, socio-economic, and institutional factors influencing agriculture, evaluate agricultural productivity and development, and examine contemporary issues related to sustainable agriculture, agricultural planning, and food security.

After successful completion of the course, students will be able to:

CO1: Explain the concepts, approaches, factors, and theories related to Agricultural Geography.

CO2: Describe agricultural types, cropping patterns, agricultural regions, and crop combination techniques.

CO3: Analyse land use patterns, agricultural productivity, efficiency, and carrying capacity.

CO4: Examine agricultural development in India with reference to agro-climatic regions, Green Revolution, White Revolution, and agricultural reforms.

CO5: Evaluate agricultural planning, sustainable agriculture, food security, agricultural marketing, and regional development through case studies.

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	3	2	1	1	–	–	2	1	–	–	1	1	3	2	1	–	1
CO2	3	3	2	2	1	–	2	2	1	1	2	2	3	3	2	1	2
CO3	3	3	3	3	2	1	3	2	2	1	2	2	3	3	3	2	2
CO4	3	3	3	3	2	2	3	2	2	2	3	3	3	3	3	2	3
CO5	3	3	3	3	3	2	3	3	2	2	3	3	3	3	3	3	3
Average	**3**	**2.8**	**2.4**	**2.4**	**1.6**	**1**	**2.6**	**2**	**1.4**	**1.2**	**2.2**	**2.2**	**3**	**2.8**	**2.4**	**1.6**	**2.2**

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

Course Input

Unit I Basic Concepts: Meaning, nature and scope of Agricultural Geography; approaches to the study of Agricultural Geography; significance of Agricultural Geography.

Unit II Factors Affecting Agriculture and Agricultural Regions: Physical, socio-economic and technological factors affecting agriculture; agro-climatic regions of India; agricultural regions of the world..

Unit III Agricultural Measures: Land use pattern; concept of carrying capacity of land; measures of agricultural efficiency and agricultural productivity.

Unit IV Agricultural Revolution and Theories: Green Revolution and White Revolution; second-generation reforms in Indian agriculture, including land and institutional reforms; organic farming and contract farming; Agricultural location theory (Von Thünen Model).

Unit V: Agricultural Planning and Contemporary Issues: Agricultural planning and regional development; agricultural marketing and supply chain management; sustainable agriculture and food security; case studies of agricultural development in India.

Text books

1. Dumont, R. (1970): Types of Rural Economy: Studies in World Agriculture, Douglas Manin, London Methuen

2. Gregor, H. P. (1970): Geography of Agriculture. Prentice-Hall, New York.

3. Husain, M. (1996): Systematic Agricultural Geography, Rawat Publications, Jaipur.

4. Misra, R. P. (1967): Diffusion of Agricultural Innovations, University of Mysore, Mysore.

5. Mohammad, A. (1978): Studies in Agricultural Geography, Rajesh Publications, New Delhi

6. Morgan, W. B. and Norton, R.J.C. (1971): Agricultural Geography. Methuen, London.

7. Sauer, O. C. (1969): Agricultural Origins and Dispersals. MIT Press, Cambridge.

8. Shafi, M. (2006): Agricultural Geography, Pearson Education, New Delhi.

Reading List

1. Basu, D.N., and Guha, G.S., 1996: Agro-Climatic Regional Planning in India, Vol.I & II, Concept Publication, New Delhi.
2. Shafi, M., 2006: Agricultural Geography, Doring Kindersley India Pvt. Ltd., New Delhi

SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 1	No Poverty	Enhances understanding of agricultural development, rural livelihoods, and income generation for farming communities.
SDG 2	Zero Hunger	Promotes knowledge of agricultural productivity, food security, sustainable farming, and agricultural planning.
SDG 8	Decent Work and Economic Growth	Develops understanding of agricultural marketing, value chains, and employment opportunities in the agricultural sector.
SDG 12	Responsible Consumption and Production	Encourages sustainable farming practices, organic agriculture, efficient resource utilization, and responsible food production.
SDG 13	Climate Action	Promotes sustainable agriculture, climate-resilient farming, and adaptation strategies to climate variability.
SDG 15	Life on Land	Supports sustainable land use, soil conservation, biodiversity protection, and environmentally sound agricultural practices.

Code	Course Title	Credit	L-T-P
GO30008	Cartography	4	3-0-1

Course Objectives

This course aims to provide students with a comprehensive understanding of the fundamental concepts, principles, and applications of cartography. It seeks to develop knowledge of map scales, map projections, and thematic mapping techniques while enhancing practical skills in map preparation, topographical map interpretation, profile drawing, and map layout design. The course also enables students to apply cartographic methods for the effective representation, analysis, and communication of geographical information.

Course Outcomes (COs)

CO1: Explain the nature, scope, principles, and significance of cartography and its role in geographical communication.

CO2: Apply different types of scales and construct graphical scales for cartographic representation.

CO3: Analyze the principles, properties, and applications of different map projections and prepare simple map projections.

CO4: Prepare and interpret thematic maps using appropriate cartographic techniques and spatial overlays.

CO5: Interpret topographical maps, prepare profiles and map layouts, and apply cartographic techniques for geographical analysis.

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	3	2	1	1	–	–	2	1	–	2	1	1	3	2	1	–	1

CO2	3	3	3	2	3	–	2	2	1	2	2	2	3	3	2	2	2
CO3	3	3	3	3	3	1	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	3	3	3	2	3	3	2	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	2	3	3	3	3	3	3	3	3
Average	**3**	**2.8**	**2.6**	**2.4**	**2.4**	**1**	**2.6**	**2.2**	**1.2**	**2.4**	**2.2**	**2**	**3**	**2.8**	**2.4**	**2**	**2.2**

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

Course Inputs

Unit I: Nature and Scope of Cartography- Meaning, nature and scope of cartography; scientific basis of cartography; cartography as a science of human communication; branches, types and significance of cartography.

Unit -II Scale- Concept, types and applications of scales; graphical construction of plain, comparative and diagonal scales.

Unit III: Map Projections: Meaning, classification and historical development of map projections; properties of map projections with reference to area, distance and direction; simple cylindrical projection and conical projection with one standard parallel.

Unit IV: Thematic Mapping Techniques and Cartographic Overlays – Properties, uses and limitations of thematic maps; representation of areal data using choropleth, dot and proportional circle maps; representation of continuous data using isopleth maps; cartographic overlays of point, line and areal data; preparation and interpretation of thematic maps

Unit V: Topographical Map and Map Layout – Interpretation of topographical maps of a mountain area using cross and longitudinal profiles; preparation of map layouts using the given spatial data.

Practical Record: A Project File in pencil, comprising one exercise each, on scale, map projection, interpretation of topographic sheet and slope analysis.

Text Book

- Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
- Mishra R.P. and Ramesh, A., 1989: Fundamentals of Cartography, Concept, New Delhi.

Reference List

- Monkhouse F. J. and Wilkinson H. R., 1973: Maps and Diagrams, Methuen, London.
- Robinson A. H., 2009: Elements of Cartography, John Wiley and Sons, New York.
- Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
- Singh, R.L. and Dutta, P.K. (2012). Prayogatmak Bhugol (Hindi), Central Book Depot, Allahabad.
- Sharma, J. P. (2010). Prayogic Bhugol (Hindi), Rastogi Publishers, Meerut
- Mishra R. P. and Ramesh A. (1989). Fundamentals of Cartography. Concept Publication, New Delhi
- Misra, R.P. (2014). Fundamentals of Cartography (Second Revised and Enlarged Edition). Concept Publishing, New Delhi. India
- Reading List 1. Cuff J. D. and Mattson M. T., 1982: Thematic Maps: Their Design and Production, Methuen Young Books.
- Dent B. D., Torguson J. S., and Holder T. W., 2008: Cartography: Thematic Map Design (6th Edition), Mcgraw- Hill Higher Education
- Gupta K. K. and Tyagi V. C., 1992: Working with Maps, Survey of India, DST, New Delhi.

1. SDG Mapping for the Course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Develops cartographic knowledge, spatial thinking, and practical mapping skills essential for geographical education and research.
SDG 9	Industry, Innovation and Infrastructure	Enhances geospatial mapping and visualization techniques that support infrastructure planning, innovation, and spatial decision-making.
SDG 11	Sustainable Cities and Communities	Supports urban and regional planning through thematic mapping, topographical interpretation, and spatial data visualization.
SDG 13	Climate Action	Facilitates climate-related mapping, hazard assessment, vulnerability analysis, and environmental monitoring for climate adaptation and mitigation.

SDG 15	Life on Land	Promotes mapping and monitoring of land resources, ecosystems, biodiversity, and land-use changes for sustainable land management.
SDG 17	Partnerships for the Goals	Encourages the use of standardized cartographic techniques and geospatial information sharing for collaborative planning, research, and policy formulation.

Code	Course Title	Credit	L-T-P
GO32002	**Vulnerability and Risk Management**	**4**	**3-1-0**

Course Objectives

This course aims to provide students with an understanding of the concepts of vulnerability, hazards, disasters, and risk management. It equips learners with knowledge of disaster risk reduction, preparedness, mitigation, and resilience for sustainable development.

Course Outcomes (COs)

CO1: Explain the concepts of hazards, disasters, vulnerability, risk, and resilience.

CO2: Assess different types of hazards and evaluate vulnerability and disaster risk.

CO3: Apply disaster risk reduction strategies, including preparedness, mitigation, and response measures.

CO4: Examine disaster management policies, institutional mechanisms, and community participation in India.

CO5: Evaluate the role of climate change adaptation and resilience in sustainable disaster risk management.

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	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	2	2	1	–	1	–	1	2	3	3	2	1	1
CO3	2	3	3	3	3	2	2	1	2	1	2	2	3	3	3	2	2
CO4	2	2	2	3	2	3	2	1	2	1	2	2	2	2	3	2	1

CO5	2	3	3	3	3	2	3	2	2	2	2	3	3	3	3	2	2
Average	**2.2**	**2.6**	**2.2**	**2.8**	**2.2**	**2**	**2**	**1.3**	**1.8**	**1.3**	**1.6**	**2.2**	**2.8**	**2.4**	**2.8**	**1.8**	**1.5**

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

Course Inputs

Unit I: Introduction to Vulnerability and Risk

Concepts of hazard, disaster, vulnerability, risk and resilience; types of hazards; disaster management cycle.

Unit II: Hazard and Vulnerability Assessment

Natural and human-induced hazards; physical, social, economic and environmental vulnerability; methods of vulnerability and risk assessment.

Unit III: Disaster Risk Reduction

Disaster preparedness, mitigation and response; early warning systems; community-based disaster risk management.

Unit IV: Disaster Management in India

Disaster management policies and institutional framework in India; role of NDMA, SDMA and local communities; disaster management case studies.

Unit V: Climate Change and Resilience

Climate change and disaster risk; adaptation and resilience; sustainable development and disaster risk management.

Text Books

1. Coppola, D. P. (2021). *Introduction to International Disaster Management*. Elsevier.
2. Carter, W. N. (2018). *Disaster Management: A Disaster Manager's Handbook*. Asian Development Bank.
3. Singh, R. B. (Ed.). (2020). *Disaster Risk Reduction: Approaches and Practices*. Springer.
4. Wisner, B., Gaillard, J. C., & Kelman, I. (2019). *The Routledge Handbook of Hazards and Disaster Risk Reduction*. Routledge.
5. Goel, S. L. (2017). *Disaster Administration and Management*. Deep & Deep Publications.

Reference Books

1. Alexander, D. (2018). *Natural Disasters*. Springer.
2. Smith, K. (2020). *Environmental Hazards: Assessing Risk and Reducing Disaster* (7th ed.). Routledge.
3. UNDRR. (2015). *Sendai Framework for Disaster Risk Reduction 2015–2030*.
4. NDMA. *National Disaster Management Guidelines*. Government of India.
5. Singh, S. (2019). *Disaster Management*. Pravalika Publications.

SDG Mapping for this course

SDG No.	SDG Title	Nature of Contribution
SDG 11	Sustainable Cities and Communities	Promotes disaster-resilient communities.
SDG 13	Climate Action	Supports climate adaptation and disaster risk reduction.
SDG 15	Life on Land	Encourages ecosystem conservation for resilience.
SDG 17	Partnerships for the Goals	Promotes collaborative disaster risk management.

Code	Course Title	Credit	L-T-P
GO32004	**Urban Studies**	**4**	**3-1-0**

Course Objectives

This course aims to introduce students to the concepts, processes, and patterns of urbanization. It enables learners to understand urban structure, urban issues, planning, and sustainable urban development.

Course Outcomes (COs)

CO1: Explain the concepts, scope, and processes of urbanization and urban development.

CO2: Analyze the structure, functions, and morphology of urban settlements.

CO3: Assess major urban problems and their socio-economic and environmental implications.

CO4: Examine principles of urban planning, governance, and smart city initiatives.

CO5: Evaluate strategies for sustainable and resilient urban development.

CO–PO–PSO Mapping

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	2	1	1	–	1	–	1	2	3	2	2	1	1
CO3	2	3	3	3	2	2	2	1	2	1	2	2	2	3	3	2	1
CO4	2	3	2	3	3	2	2	1	2	2	2	2	3	3	2	2	2
CO5	2	3	3	3	3	2	3	2	2	2	2	3	3	3	3	2	2
Average	**2.2**	**2.8**	**2.2**	**2.8**	**2.2**	**1.6**	**2**	**1.3**	**1.8**	**1.3**	**1.6**	**2.2**	**2.8**	**2.4**	**2.5**	**1.8**	**1.5**
Mapping Scale:																	
1 – Low (Weakly Mapped)								3 – High (Strongly Mapped)									
2 – Medium (Moderately Mapped)								"–" No Correlation									

Course Inputs

Unit I: Introduction to Urban Studies

Concept, nature and scope of Urban Studies; urbanization and urban growth; factors influencing urban development.

Unit II: Urban Structure and Functions

Classification of urban settlements; urban morphology; functions of towns and cities; theories of urban structure.

Unit III: Urbanization and Urban Problems

Trends and patterns of urbanization; housing, slums, transportation, pollution, waste management and other urban issues.

Unit IV: Urban Planning and Management

Concept and principles of urban planning; urban governance; smart cities; urban infrastructure and services.

Unit V: Sustainable Urban Development

Sustainable urban development; urban resilience; SDGs and urban development; challenges and prospects of urbanization in India.

Text Books

1. Pacione, M. (2020). *Urban Geography: A Global Perspective*. Routledge.
2. Hall, T. (2018). *Urban Geography*. Routledge.

3. Knox, P. L., & McCarthy, L. (2019). *Urbanization: An Introduction to Urban Geography*. Pearson.
4. Ramachandran, R. (2017). *Urbanization and Urban Systems in India*. Oxford University Press.
5. Kaplan, D. H., Wheeler, J. O., & Holloway, S. R. (2020). *Urban Geography* (4th ed.). Wiley.

Reference Books

1. Hall, P. (2014). *Cities of Tomorrow*. Wiley-Blackwell.
2. Kundu, A. (2019). *Urban Development in India*. Sage Publications.
3. United Nations. (2019). *World Urbanization Prospects*. UN Publications.
4. Carter, H. (2016). *The Study of Urban Geography*. Edward Arnold.
5. Singh, R. L. (2018). *Urban Geography*. Prayag Pustak Bhawan.

SDG No.	SDG Title	Nature of Contribution
SDG 9	Industry, Innovation and Infrastructure	Promotes sustainable urban infrastructure.
SDG 11	Sustainable Cities and Communities	Encourages sustainable urban planning and development.
SDG 13	Climate Action	Supports climate-resilient urban development.
SDG 16	Peace, Justice and Strong Institutions	Strengthens urban governance and planning.

Code	Course Title	Credit	L-T-P
GO32006	**Geography of Agriculture**	**4**	**3-1-0**

Course Objectives

This course aims to provide students with an understanding of agricultural systems, land use, and factors influencing agricultural activities. It enables learners to analyze agricultural patterns, productivity, and sustainable agricultural development.

Course Outcomes (COs)

CO1: Explain the concepts, scope, and determinants of Agricultural Geography.

CO2: Analyze agricultural land use, cropping patterns, and agricultural location theories.

CO3: Assess agricultural productivity, food security, and agricultural development.

CO4: Examine the major challenges and planning strategies for sustainable agricultural development.

CO5: Evaluate the role of sustainable farming practices and geospatial technologies in modern agriculture.

CO–PO–PSO Mapping

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	2	1	1	–	1	–	1	2	3	2	2	1	1
CO3	2	3	3	3	3	2	1	1	2	1	2	2	3	3	3	2	2
CO4	2	3	2	3	3	2	2	1	2	1	2	2	3	3	2	2	2
CO5	2	3	3	3	3	2	2	2	2	2	2	3	3	3	3	3	3
Average	**2.2**	**2.8**	**2.2**	**2.8**	**2.4**	**1.6**	**1.5**	**1.3**	**1.8**	**1**	**1.6**	**2.2**	**3**	**2.4**	**2.5**	**2**	**2**

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

Course Inputs

Unit I: Introduction to Agricultural Geography

Nature, scope and significance of Agricultural Geography; determinants of agriculture; agricultural systems and types of farming.

Unit II: Agricultural Land Use

Agricultural land use and cropping patterns; theories of agricultural location (Von Thünen Model); agricultural regions of India**.**

Unit III: Agricultural Productivity

Agricultural productivity and efficiency; Green Revolution; agricultural diversification; food security.

Unit IV: Agricultural Issues and Planning

Problems of Indian agriculture; irrigation, soil degradation, climate change and agriculture; agricultural planning and rural development**.**

Unit V: Sustainable Agriculture

Concept of sustainable agriculture; organic farming; precision agriculture; role of geospatial technology in agriculture**.**

Text Books

1. Singh, J., & Dhillon, S. S. (2020). *Agricultural Geography*. Tata McGraw-Hill, New Delhi.
2. Grigg, D. (2019). *An Introduction to Agricultural Geography*. Routledge.
3. Morgan, W. B., & Munton, R. J. C. (2018). *Agricultural Geography*. Routledge.
4. Hussain, M. (2021). *Agricultural Geography*. Rawat Publications, Jaipur.
5. Bhalla, G. S., & Singh, G. (2017). *Indian Agriculture: Four Decades of Development*. Sage Publications.

Reference Books

1. Bowler, I. R. (2016). *The Geography of Agriculture in Developed Market Economies*. Routledge.
2. Turner, B. L., & Brush, S. B. (2018). *Comparative Farming Systems*. Guilford Press.
3. Randhawa, M. S. (2015). *Agriculture and Rural Development in India*. Oxford University Press.
4. Singh, R. L. (2018). *Agricultural Geography*. Prayag Pustak Bhawan.

SDG Mapping for this course

SDG No.	SDG Title	Nature of Contribution
SDG 2	Zero Hunger	Promotes sustainable agriculture and food security.
SDG 12	Responsible Consumption and Production	Encourages sustainable farming practices.
SDG 13	Climate Action	Supports climate-resilient agriculture.
SDG 15	Life on Land	Promotes sustainable land and soil management.

Code	Course Title	Credit	L-T-P
GO32008	**Cartographic Techniques**	**4**	**3-0-1**

Course Objectives

This course aims to introduce students to the principles and techniques of cartography. It develops skills in map interpretation, map design, thematic mapping, and graphical representation of geographical data.

Course Outcomes (COs)

CO1: Explain the principles, elements, and importance of cartography in geographical studies.

CO2: Apply map scales, projections, and conventional symbols for map preparation and interpretation.

CO3: Prepare and interpret graphical representations of geographical data.

CO4: Construct and analyze thematic maps using appropriate cartographic techniques.

CO5: Demonstrate the use of digital cartography and GIS-based mapping for spatial analysis.

CO–PO–PSO Mapping

COs \ POs/PSOs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	3	2	1	–	1	–	1	2	3	3	2	1	2
CO3	2	3	2	3	3	2	1	1	2	1	2	2	3	3	3	2	2
CO4	2	3	3	3	3	2	2	1	2	1	2	2	3	3	3	3	2
CO5	2	3	3	3	3	2	2	2	2	2	2	3	3	3	3	3	3
Average	**2.2**	**2.8**	**2.2**	**2.8**	**2.6**	**1.8**	**1.5**	**1.3**	**1.8**	**1.3**	**1.6**	**2.2**	**3**	**2.6**	**2.8**	**2.3**	**2.3**

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

Course Inputs

Unit I: Introduction to Cartography

Nature and scope of cartography; types and elements of maps; map scale, projection, and conventional signs.

Unit II: Map Representation Techniques

Methods of relief representation; topographic maps; map interpretation; introduction to thematic mapping.

Unit III: Graphical Representation of Data

Bar diagrams, pie diagrams, line graphs, histograms, frequency curves, and climographs.

Unit IV: Thematic Mapping Techniques

Dot maps, choropleth maps, isopleth maps, proportional symbol maps, flow maps, and cartograms.

Unit V: Modern Cartography

Digital cartography; computer-assisted mapping; introduction to GIS-based mapping; applications of cartography in geographical studies.

Text Books

1. Singh, R. L., & Dutt, P. K. (2018). *Elements of Practical Geography*. Kalyani Publishers.
2. Misra, R. P., & Ramesh, A. (2019). *Fundamentals of Cartography*. Concept Publishing Company.
3. Tyner, J. A. (2019). *Principles of Map Design*. Guilford Press.
4. Dent, B. D., Torguson, J. S., & Hodler, T. W. (2020). *Cartography: Thematic Map Design* (7th ed.). McGraw-Hill.
5. Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient BlackSwan.

E-Reference:

https://onlinecourses.swayam2.ac.in/e-learning/preview/cec26_hs57

https://onlinecourses.swayam2.ac.in/e-learning/preview/cec26_hs62

SDG Mapping for this course

SDG No.	SDG Title	Nature of Contribution
SDG 4	Quality Education	Develops cartographic and spatial analysis skills.
SDG 9	Industry, Innovation and Infrastructure	Promotes digital mapping and geospatial innovation.
SDG 11	Sustainable Cities and Communities	Supports spatial planning and urban management.
SDG 13	Climate Action	Facilitates mapping and monitoring of environmental and climate-related changes.

SEMESTER-VII (Single Major/Double Major)

(Without Research / With Research)

Course code	Title	L-T-P	Credit
SR40001	**Social Research Methods**	**3-1-0**	**4**

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

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	1	–	2	1	2	1	–	2	1	2	–	–	1	–
CO2	2	3	2	2	1	2	2	2	1	1	2	1	2	1	–	2	1
CO3	2	2	3	2	2	3	2	2	2	1	2	1	2	2	–	2	1
CO4	2	2	2	3	1	2	2	2	1	2	3	3	3	2	1	2	1
CO5	1	2	2	3	3	2	2	2	3	2	3	2	2	1	2	1	2
Average	**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**	**1.0**
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	L-T-P	Credit
GO40003	**Geography Of Odisha**	**3-1-0**	**4**

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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 (12 Lectures)**

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 (12 Lectures)

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 (12 Lectures)**

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 (12 Lectures)**

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 (12 Lectures)**

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**	**L-T-P**	**Credit**
GO40005	**Demography of Tribal Odisha**	**3-1-0**	**4**

Course 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↓	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	1	–	–	1	2	1	–	–	–	1	3	2	–	–	–
CO 2	3	3	1	2	1	1	2	1	1	–	–	1	3	2	–	1	–
CO 3	3	3	2	2	2	2	2	2	1	1	–	1	3	3	2	1	1
CO 4	3	3	2	3	2	2	3	2	2	1	1	2	3	3	2	2	1
CO 5	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 (12 Lectures)

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 (12 Lectures)

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

UNIT-III: Factors Affecting Tribal Distribution and Welfare (12 Lectures)

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 (12 Lectures)

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 (12 Lectures)

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

Code	Course 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	PO10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4	PSO5
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 (12 Lectures)**

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 (12 Lectures)

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 (12 Lectures)

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 (12 Lectures)**

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 (12 Lectures)

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 Category Minor for other Discipline students

Code	Course Title	Credit	L-T-P

GO42001	Tribal Demography of Odisha	4	3-1-0

Course Objectives

This course aims to provide students with an understanding of the demographic characteristics of the tribal population of Odisha. It enables learners to analyze population distribution, growth, socio-economic conditions, health, migration, and contemporary challenges affecting tribal communities.

Course Outcomes (COs)

- **CO1:** Explain the concepts and demographic characteristics of tribal communities in Odisha.
- **CO2:** Analyze the distribution, growth, composition, and socio-economic characteristics of the tribal population.
- **CO3:** Assess fertility, mortality, migration, and other demographic processes affecting tribal communities.
- **CO4:** Examine tribal health, education, livelihood, and development issues, including those of PVTGs.
- **CO5:** Evaluate tribal development policies and contemporary demographic challenges for sustainable development.

CO–PO–PSO Mapping

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	2	2	1	–	1	–	1	2	3	3	2	1	1
CO3	2	3	3	3	2	2	1	1	2	1	2	2	3	3	3	2	2
CO4	2	3	2	3	3	2	2	1	2	1	2	2	3	3	2	2	2
CO5	2	3	3	3	3	2	2	2	2	2	2	3	3	3	3	2	2
Average	**2.2**	**2.8**	**2.2**	**2.8**	**2.2**	**1.8**	**1.5**	**1**	**1.4**	**1**	**1.6**	**2.2**	**3**	**2.6**	**2**	**1.4**	**1.4**

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

Course Inputs

Unit I: Introduction to Tribal Demography

Concept, nature and scope of tribal demography; tribes of Odisha; sources of demographic data; demographic profile of Scheduled Tribes in Odisha.

Unit II: Population Characteristics

Distribution and growth of tribal population; age-sex composition; literacy; work participation; population density; demographic transition among tribal communities.

Unit III: Demographic Processes

Fertility, mortality and migration among tribal communities; determinants and demographic implications; population change in tribal areas.

Unit IV: Health and Socio-economic Conditions

Tribal health, nutrition, education, livelihood, poverty and human development; demographic issues of Particularly Vulnerable Tribal Groups (PVTGs).

Unit V: Tribal Development and Contemporary Issues

Tribal development programmes; constitutional safeguards; sustainable tribal development; emerging demographic challenges in Odisha

Text Books

1. Ota, A. B., Mohanty, S. C., & Mohanty, B. N. (2018). *Demographic Profile of Scheduled Tribes of Odisha (1961–2011)*. SCSTRTI, Bhubaneswar.
2. Ota, A. B., & Mohanty, B. N. (2021). *Population Analysis: Scheduled Tribes of Odisha (1961–2011)*. SCSTRTI, Bhubaneswar.
3. Bhende, A., & Kanitkar, T. *Principles of Population Studies*. Himalaya Publishing House.
4. Sinha, V. C., & Zacharia, E. *Elements of Demography*. Allied Publishers.
5. Behera, D. K. *Tribes of Odisha*. Sonali Publications.

Reference Books

1. Census of India 2011: Primary Census Abstract – Scheduled Tribes.
2. SCSTRTI, Bhubaneswar. *Particularly Vulnerable Tribal Groups of Odisha*.
3. Ministry of Tribal Affairs, Government of India. *Tribal Statistical Profile*.
4. Mohanty, B. B. *Tribal Development in Odisha*.
5. Government of Odisha. *Odisha Human Development Report*.

SDG Mapping for this Course

SDG No.	SDG Title	Nature of Contribution
SDG 3	Good Health and Well-being	Promotes tribal health and nutrition.

SDG 4	Quality Education	Supports tribal education and literacy.
SDG 10	Reduced Inequalities	Addresses socio-economic disparities among tribal communities.
SDG 16	Peace, Justice and Strong Institutions	Promotes inclusive tribal governance and constitutional safeguards.

Code	Course Title	Credit	L-T-P
GO42003	**Environment and Sustainability**	**4**	**3-1-0**

Course Objectives

This course aims to provide students with an understanding of environmental systems, ecosystem functioning, natural resource management, and sustainability principles. It develops knowledge of environmental challenges, climate change, conservation strategies, and sustainable development from a geographical perspective.

Course Outcomes (COs)

CO1: Explain the concepts, scope, and components of Environmental Geography.

CO2: Analyze natural resources and environmental management strategies.

CO3: Assess the causes, impacts, and control measures of environmental pollution.

CO4: Examine climate change, environmental hazards, and their implications for society and ecosystems.

CO5: Evaluate sustainable development practices and environmental policies for resource conservation.

CO–PO–PSO Mapping

COs \ POs/PSOs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	2	2	1	–	1	–	1	2	3	3	2	1	1
CO3	2	3	3	3	3	2	2	1	2	1	2	2	3	3	3	2	2
CO4	2	3	3	3	3	2	3	1	2	1	2	2	3	3	3	2	2
CO5	2	3	3	3	3	2	3	2	2	2	2	3	3	3	3	3	3
Average	**2.2**	**2.8**	**2.4**	**2.8**	**2.4**	**1.8**	**2.3**	**1.3**	**1.4**	**1**	**1.6**	**2.2**	**3**	**2.6**	**2.8**	**1.6**	**1.6**

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

Course Inputs

Unit I: Fundamentals of Environment and Sustainability

Concept, scope, and significance of environment and sustainability. Components of the environment, ecosystem structure and functions, human–environment interactions, and principles of sustainable development**.**

Unit II: Natural Resources and Sustainable Management

Classification of natural resources; renewable and non-renewable resources; resource conservation; sustainable resource management; ecosystem services.

Unit III: Environmental Pollution and Conservation

Types, sources, impacts, and control measures of air, water, soil, and noise pollution. Solid waste management, environmental degradation, and environmental conservation practices.

Unit IV: Climate Change and Environmental Sustainability

Climate change, global warming, ozone layer depletion, biodiversity conservation, environmental hazards, disaster risk reduction, and climate adaptation strategies.

Unit V: Sustainable Development and Environmental Governance

Sustainable Development Goals (SDGs); environmental impact assessment (EIA); environmental ethics; environmental policies, legislation, and governance in India.

Text Books

1. Singh, S. (2021). *Environmental Geography*. Prayag Pustak Bhawan, Allahabad.
2. Goudie, A. (2018). *The Human Impact on the Natural Environment* (8th ed.). Wiley-Blackwell.
3. Savindra Singh. (2020). *Environmental Geography*. Prayag Pustak Bhawan.
4. Miller, G. T., & Spoolman, S. (2021). *Environmental Science* (16th ed.). Cengage Learning.
5. Saxena, H. M. (2019). *Environmental Geography*. Rawat Publications.

Reference Books

1. Cunningham, W. P., & Cunningham, M. A. (2020). *Principles of Environmental Science*. McGraw-Hill.
2. UNEP. *Global Environment Outlook (GEO)*.
3. IPCC. *Assessment Reports on Climate Change*.
4. Ministry of Environment, Forest and Climate Change (MoEFCC). *Environmental Reports and Policies*.

5. Odum, E. P., & Barrett, G. W. (2017). *Fundamentals of Ecology*.

SDG Mapping for this course

SDG No.	SDG Title	Nature of Contribution
SDG 6	Clean Water and Sanitation	Promotes water resource conservation and pollution control.
SDG 11	Sustainable Cities and Communities	Supports sustainable environmental planning.
SDG 12	Responsible Consumption and Production	Encourages sustainable use of natural resources, waste management, recycling, and environmental stewardship.
SDG 13	Climate Action	Enhances awareness of climate change and adaptation.
SDG 15	Life on Land	Encourages biodiversity conservation and sustainable ecosystem management.

SEMESTER-VIII (Single Major/ Double Major)

Code	Course Title	Credit	L-T-P
GO40002	**Application of Remote Sensing and GIS**	**4**	**3-1-0**

Course Learning Objectives: Remote Sensing and GIS technology is an emerging field of study that includes Geographic Information System (GIS), Remote Sensing (RS) and Global Positioning System (GPS). This would enable the students to acquire data that is referenced to the earth and use it for analysis, modeling, simulations and visualization. Geospatial technology would allow them to make informed decisions based on the importance and priority of resources most of which are limited in nature. It may be used to reveal spatial patterns that are embedded in large volumes of data that may not be accessed collectively or mapped otherwise.

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

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 and Sons

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

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

Course Objectives:

This course aims to develop an understanding of the principles and practices of sustainable natural resource management. It focuses on the planning, conservation, and sustainable utilization of land, water, forests, minerals, biodiversity, and energy resources while promoting environmental sustainability, climate resilience, and sustainable development.

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 →	**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	–	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: Foundations of Sustainable Natural Resource Management: Concept, scope, and significance of Sustainable Natural Resource Management (SNRM). Classification and distribution of natural resources. Principles of sustainability, Triple Bottom Line (TBL), and Sustainable Development Goals (SDGs). Biodiversity: concept, values, hotspots, threats, and conservation strategies. Sustainable management of forest and wildlife resources. Climate change, global warming, and agro-ecological regions.

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 and Sustainable Development: Environmental ethics and sustainable resource governance; equitable use of natural resources for sustainable livelihoods; public awareness and community participation in resource conservation; Sustainable Development Goals (SDGs) with special reference to Role of Sustainable Development Goals (SDGs) in sustainable natural resource management, with special reference to SDGs 6, 7, 12, 13, 14, and 15

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 14	Life Below Water	Promotes conservation and sustainable management of marine and coastal ecosystems.
SDG 15	Life on Land	Biodiversity conservation, forest management and wildlife protection

Code	Course Title	Credit	L-T-P
GO40006	**Social and Cultural Geography**	**4**	**3-1-0**

Course Learning Objectives:

This course introduces the basic concepts and perspectives of Social and Cultural Geography. It examines the spatial dimensions of society, culture, and human diversity, with special emphasis on the tribal communities of India and Odisha, while promoting an understanding of contemporary social and cultural issues.

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**	**PO7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**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

Course Inputs

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

Code	Course 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.

Pedagogy: Lectures, Power Point Presentation, Assignments, Quiz, Projects

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 Outcome																	

s ↓																	
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 Category Minor for other Discipline students

Code	Course Title	Credit	L-T-P
GO42002	Fundamentals of Remote Sensing and GIS	4	3-1-0

Course Objectives

This course aims to introduce students to the principles and applications of Remote Sensing and Geographic Information Systems (GIS). It enables learners to acquire basic skills in geospatial data collection, analysis, mapping, and spatial decision-making.

Course Outcomes (COs)

CO1: Explain the basic concepts and principles of Remote Sensing, GIS and GPS.

CO2: Describe the principles of image acquisition, sensors, platforms and image interpretation.

CO3: Demonstrate the concepts of GIS, spatial databases and raster-vector data models.

CO4: Apply Remote Sensing, GIS and GPS in solving geographical and environmental problems.

CO5: Evaluate the role of emerging geospatial technologies in sustainable resource management and decision-making.

CO–PO–PSO Mapping

COs \ POs/PSOs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	3	2	1	2	2	1	–	–	–	–	1	2	3	2	1	–	1
CO2	2	3	2	3	3	2	1	–	1	–	1	2	3	3	2	1	2
CO3	2	3	3	3	3	2	1	1	2	1	2	2	3	3	3	2	3
CO4	2	3	3	3	3	2	2	1	2	2	2	2	3	3	3	3	3
CO5	2	3	3	3	3	2	2	2	2	2	2	3	3	3	3	3	3
Average	**2.2**	**2.8**	**2.4**	**2.8**	**2.8**	**1.8**	**1.5**	**1.3**	**1.4**	**1.7**	**1.6**	**2.2**	**3**	**2.8**	**2.4**	**1.8**	**2.4**
Mapping Scale:																	
1 – Low (Weakly Mapped)								3 – High (Strongly Mapped)									
2 – Medium (Moderately Mapped)								“–” No Correlation									

Course Inputs

Unit I: Introduction to Remote Sensing and GIS

Nature, scope and significance of Remote Sensing and GIS; history and development; components of Remote Sensing and GIS; electromagnetic spectrum.

Unit II: Remote Sensing Fundamentals

Principles of remote sensing; platforms and sensors; image resolution (spatial, spectral, temporal and radiometric); visual image interpretation elements.

Unit III: Geographic Information System

Concept and components of GIS; spatial and attribute data; data input, storage, editing and database management; raster and vector data models.

Unit IV: GPS and Geospatial Applications

Global Positioning System (GPS); Digital Elevation Model (DEM); applications of Remote Sensing and GIS in agriculture, urban planning, disaster management, forestry and environmental studies.

Unit V: Applications of Remote Sensing and GIS

Basic applications of Remote Sensing and GIS in agriculture, forestry, urban planning, disaster management, environmental monitoring, and natural resource management.

Text Books

1. Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2022). *Remote Sensing and Image Interpretation* (8th ed.). Wiley.
2. Campbell, J. B., & Wynne, R. H. (2020). *Introduction to Remote Sensing* (6th ed.). Guilford Press.
3. Chang, K. T. (2021). *Introduction to Geographic Information Systems* (10th ed.). McGraw-Hill Education.
4. Joseph, G. (2018). *Fundamentals of Remote Sensing* (3rd ed.). Universities Press.
5. Burrough, P. A., McDonnell, R. A., & Lloyd, C. D. (2015). *Principles of Geographical Information Systems*. Oxford University Press.

Reference Books

1. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). *Geographic Information Science and Systems* (4th ed.). Wiley.
2. Jensen, J. R. (2016). *Introductory Digital Image Processing: A Remote Sensing Perspective*. Pearson.
3. Sabins, F. F., & Ellis, J. M. (2020). *Remote Sensing: Principles and Interpretation* (4th ed.). Waveland Press.
4. Lo, C. P., & Yeung, A. K. W. (2016). *Concepts and Techniques of Geographic Information Systems*. Pearson.
5. Heywood, I., Cornelius, S., & Carver, S. (2018). *An Introduction to Geographical Information Systems*. Pearson.

E- Reference: https://onlinecourses.nptel.ac.in/e-learning/preview/noc25_ce108

SDG Mapping for this course

SDG No.	SDG Title	Nature of Contribution

SDG 9	Industry, Innovation and Infrastructure	Promotes geospatial innovation and technology.
SDG 11	Sustainable Cities and Communities	Supports spatial planning and urban management.
SDG 13	Climate Action	Enables environmental monitoring and climate assessment.
SDG 15	Life on Land	Facilitates natural resource mapping and ecosystem conservation.

Code	Course Title	Credit	L-T-P
GO42004	**Natural Resources and Sustainable Management**	**4**	**3-1-0**

Course Objectives

This course aims to provide students with an understanding of natural resources, their distribution, utilization, and conservation. It enables learners to analyze sustainable resource management practices for environmental protection and balanced regional development.

Course Outcomes (COs)

CO1: Explain the concepts, classification, and distribution of natural resources.

CO2: Analyze the utilization and sustainable management of land and water resources.

CO3: Assess the conservation and management of forest, mineral, and biodiversity resources.

CO4: Examine conventional and renewable energy resources and their role in sustainable development.

CO5: Evaluate sustainable resource management strategies and the application of geospatial technology in natural resource conservation.

CO–PO–PSO Mapping

COs \ POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1	1	–	–	–	–	1	2	3	1	–	–	–
CO2	2	3	2	3	2	2	1	–	1	–	1	2	3	3	2	1	1
CO3	2	3	3	3	3	2	2	1	2	1	2	2	3	3	3	2	2
CO4	2	3	2	3	3	2	2	1	2	1	2	2	3	3	2	2	2
CO5	2	3	3	3	3	2	3	2	2	2	2	3	3	3	3	3	3
Average	**2.2**	**2.8**	**2.2**	**2.8**	**2.4**	**1.8**	**2**	**1.3**	**1.4**	**1**	**1.6**	**2.2**	**3**	**2.6**	**2**	**1.6**	**1.6**
Mapping Scale:																	

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

Course Inputs

Unit I: Introduction to Natural Resources

Nature, scope and classification of natural resources; renewable and non-renewable resources; distribution and utilization of natural resources.

Unit II: Land and Water Resources

Land and water resources; soil conservation; watershed management; sustainable utilization of land and water resources.

Unit III: Forest and Mineral Resources

Forest and mineral resources; conservation and management; biodiversity conservation; sustainable resource utilization.

Unit IV: Energy Resources

Conventional and non-conventional energy resources; energy conservation; renewable energy and sustainable development.

Unit V: Sustainable Resource Management

Concept and principles of sustainable resource management; environmental conservation; resource management policies; role of geospatial technology in natural resource management.

Text Books

1. Owen, S., Pickering, K., & Owen, C. (2017). *An Introduction to Sustainable Development*. Routledge.
2. Saxena, H. M. (2018). *Environmental Geography*. Rawat Publications.
3. Singh, S. (2020). *Environmental Geography*. Prayag Pustak Bhawan.
4. Cunningham, W. P., & Cunningham, M. A. (2020). *Principles of Environmental Science*. McGraw-Hill Education.
5. Tiwari, G. N., & Ghosal, M. K. (2018). *Renewable Energy Resources*. Narosa Publishing House.

Reference Books

1. Miller, G. T., & Spoolman, S. (2021). *Environmental Science*. Cengage Learning.
2. Odum, E. P., & Barrett, G. W. (2017). *Fundamentals of Ecology*. Cengage Learning.

3. MoEFCC. *India State of Forest Report*.
4. FAO. *The State of the World's Forests*.
5. UNEP. *Global Environment Outlook*.

SDG Mapping for this course

SDG No.	SDG Title	Nature of Contribution
SDG 6	Clean Water and Sanitation	Promotes sustainable water resource management.
SDG 7	Affordable and Clean Energy	Encourages renewable energy and energy conservation.
SDG 12	Responsible Consumption and Production	Supports sustainable resource utilization.
SDG 15	Life on Land	Promotes conservation of natural resources and biodiversity.

Code	Course Title	Credit	L-T-P
RD40082	**Research and Dissertation**	4	0-0-12

Course Learning Objectives: To induce hands-on experience by virtue of the project done on the field based problem.

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

CO1: Remember the different methods and steps of report writing.

CO2: Understand the value and benefit of doing fieldwork.

CO3: Apply to their local problems for solution.

CO4: Analyse the whole field work for interpretation.

CO5: Evaluate their field work experience in real life situation.

CO6: Create self-confidence and courage in solving various issues in their areas.

CO–PO-PSO Mapping Matrix using standard correlation levels:
3 = High, 2 = Medium, 1 = Low, – = No correlation

COs \ POs & PSOs	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	PS O5
CO1	3	2	1	1	2	1	1	2	1	2	1	2	3	2	1	2	1
CO2	3	2	2	2	2	2	2	2	2	2	1	2	3	2	2	2	1
CO3	3	3	3	3	2	2	2	2	2	2	2	3	3	3	3	2	2
CO4	3	3	3	3	3	2	2	3	2	3	2	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3
CO6	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3

SDG Mapping with SDG Title and Contribution:

SDG No.	SDG Title	Contribution of the Course
SDG 4	Quality Education	Enhances research skills, academic writing, and experiential learning.
SDG 5	Gender Equality	Encourages inclusive and gender-sensitive field-based inquiry.
SDG 8	Decent Work and Economic Growth	Supports practical problem-solving and employability through field exposure.
SDG 10	Reduced Inequalities	Promotes inclusive research and local issue-based problem solving.
SDG 11	Sustainable Cities and Communities	Encourages local-level inquiry and practical community solutions.
SDG 16	Peace, Justice and Strong Institutions	Strengthens ethical research, accountability, and evidence-based understanding.
SDG 17	Partnerships for the Goals	Encourages collaboration with communities, institutions, and stakeholders.

Recommended Learning Resources

Textbooks:

1. Ahuja, Ram (2010), Research Methods. Jaipur: Rawat Publication.
2. Bauer M.W. and G. Gaskell (eds.). (2000). Qualitative Research with Text, Image and Sound: A Practical Handbook. London, Sage Publications.

3. Denzin, N.K. and Y.S. Lincoln. (eds.). (2000). Handbook of Qualitative Research. New York, Sage.
4. Flick, U. (2009). An Introduction to Qualitative Research (4th Edition). London, Sage Publications.
5. Grbich, C. (2004). New Approaches in Social Research. London, Sage Publications.
6. Gupta, C.B and Gupta, V. An Introduction to Statistical Methods, New Delhi: Vikas Publishing House PVT Ltd.
7. Kothari, C. R. Research Methodology, Methods and Techniques –Wiley Eastern Limited – New Delhi.
8. Silverman, D. (ed.). (2011) Qualitative Research (3rd Edition). London, Sage Publications.

Note: Latest edition of the textbooks should be used.



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