K. C. E. Society's
Moolji Jaitha College
An 'Autonomous College' Affiliated to
K.B.C. North Maharashtra University, Jalgaon.
NAAC Reaccredited Grade - A (CGPA : 3.15 - 3rd Cycle)
UGC honoured "College of Excellence" (2014-2019)
DST(FIST) Assisted College

KNOWLEDGE IS POWER
ESTD. 1945

के. सी. ई. सोसायटीचे
मूळजी जेठा महाविद्यालय
क.ब.चौ. उत्तर महाराष्ट्र विद्यापीठ, जळगाव संलग्नित
'स्वायत्त महाविद्यालय'
नॅकद्वारा पुनर्मानांकित श्रेणी – 'ए' (सी.जी.पी.ए. : ३.१५ – तिसरी फेरी)
विद्यापीठ अनुदान आयोगाद्वारा घोषित 'कॉलेज ऑफ एक्सलन्स' (२०१४-२०१९)
डी.एस.टी. (फीस्ट) अंतर्गत अर्थसहाय्य प्राप्त

Date :- 01/08/2024

NOTIFICATION

Sub :- CBCS Syllabi of B. Sc. in Geography (Sem. III & IV)

Ref. :- Decision of the Academic Council at its meeting held on 27/07/2024.

The Syllabi of B. Sc. in Geography (Third and Fourth Semesters) as per **NATIONAL EDUCATION POLICY – 2020 (2023 Pattern)** and approved by the Academic Council as referred above are hereby notified for implementation with effect from the academic year 2024-25.

Copy of the Syllabi Shall be downloaded from the College Website (www.kcesmjcollege.in)

Sd/-
Chairman,
Board of Studies

To :

1) The Head of the Dept., M. J. College, Jalgaon.
2) The office of the COE, M. J. College, Jalgaon.
3) The office of the Registrar, M. J. College, Jalgaon.

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समर्थ कॉलनी जवळ, जळगांव – ४२५ ००२. (महाराष्ट्र, भारत) । दूरध्वनी क्र. : +९१ २५७–२२३७३६३, २२३४२८१ । ई–मेलः mjcollege@kces.in । वेबसाईटः mjcollege.kces.in

Khandesh College Education Society's

Moolji Jaitha College, Jalgaon

An "Autonomous College"

Affiliated to

Kavayitri Bahinabai Chaudhari

North Maharashtra University, Jalgaon-425001

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STRUCTURE AND SYLLABUS

B.Sc. Honours/Honours with Research (S.Y. B.Sc. Geography)

Under Choice Based Credit System (CBCS)
and
as per NEP-2020 Guidelines

[w.e.f. AcademicYear:2024-25]

Preface

Geography, as a subject, is an ancient discipline that explores the interactions between humans and their environment. Over the years, geography has evolved and incorporated various technological advancements, leading to significant developments in the field. One such noteworthy transformation has been the integration of Remote Sensing (RS), Geographic Information Systems (GIS), and Global Positioning System (GPS) technologies. These cutting-edge tools have revolutionized how geographers collect, analyze, and interpret spatial data, making geography an even more dynamic and relevant subject in contemporary times.

The Department of Geography at M. J. College (Autonomous), Jalgaon, is at the forefront of embracing these recent trends in geography. Through the courses offered, including B.A. Geography, B.Sc. Geography, M.A/M.Sc. Geography, and Ph.D., the department equips students with comprehensive knowledge and practical skills to navigate the complexities of modern geography. Additionally, the Certificate Course in Geoinformatics serves as a valuable platform for students to delve deeper into the applications of RS, GIS, and GPS technologies.

One of the standout characteristics of the Department is its team of expert and qualified faculties. These educators not only possess extensive academic knowledge but also have hands-on experience in utilizing geospatial technologies effectively. Their guidance empowers students to explore and understand the intricacies of geographical phenomena using the latest tools and methodologies. The Department boasts state-of-the-art facilities, including smart laboratories for practicals, a central library supplemented with a departmental library, and a well-equipped GIS computer lab with internet access. The availability of these resources ensures that students have ample opportunities to engage in hands-on learning and conduct research, contributing to a comprehensive understanding of geographic concepts. Moreover, the Department has been recognized as a research center for Ph.D. studies, encouraging scholarly pursuits in the realm of geography. This designation highlights the institution's commitment to pushing the boundaries of geographical knowledge and fostering innovative research in the field. The integration of technology in geography education is further augmented by the presence of smart classrooms and advanced geographical instruments. These resources enable interactive learning and support students in developing a deep appreciation for the spatial dimensions of various phenomena. In addition to academic excellence, the Department is devoted to providing specialized coaching for national-level exams such as NET/SET and competitive examinations. This emphasis on exam preparation equips students with the necessary skills to excel in their careers and become leading professionals in the field of geography. The collaboration with the Indian Institute of Remote Sensing (IIRS) as an Outreach Training Program center is a testament to the Department's commitment to keeping abreast of the latest advancements in geospatial technology. This association allows students and faculties to participate in training programs conducted by experts in the field, enhancing their knowledge and skills in RS, GIS, and GPS applications. Furthermore, the Department of Geography at M. J. College (Autonomous), Jalgaon, proudly boasts access to the best telescopes for sky watching. This unique feature provides students with an opportunity to explore celestial phenomena and their connections with the Earth, bridging the gap between the terrestrial and astronomical realms.

Finally, the Department's focus on career opportunities in geography ensures that graduates are well-prepared to enter various professional fields. The interdisciplinary nature of geography opens doors to careers in environmental management, urban planning, disaster management, cartography, geospatial analysis, and more. The versatility of geography as a subject makes it a rewarding and promising choice for students seeking diverse and impactful career paths. The Department of Geography at M. J. College (Autonomous), Jalgaon, stands as a vibrant and progressive hub for geography education. The integration of RS, GIS, and GPS technologies, coupled with expert faculty, modern facilities, and extensive research opportunities, equips students to become adept geographers, ready to address the pressing challenges of our ever-changing world.

Program Outcomes (PO) for B.Sc. Program:

Program outcomes associated with a B.Sc. degree are as follows:

PO No.	PO
PO1	Graduates should have a comprehensive knowledge and understanding of the fundamental principles, theories, and concepts in their chosen field of study.
PO2	Graduates should possess the necessary technical skills and competencies related to their discipline, including laboratory techniques and data analysis.
PO 3	Graduates should be able to identify, analyze, and solve complex problems using logical and critical thinking skills. They should be able to apply scientific methods and principles to investigate and find solutions.
PO4	Graduates should be proficient in effectively communicating scientific information, both orally and in writing.
PO 5	Graduates should have a basic foundation in research methods and be capable of designing and conducting scientific investigations.
PO 6	Graduates should be able to work effectively as part of a team, demonstrating the ability to collaborate with others, respect diverse perspectives, and contribute to group projects.
PO 7	Graduates should recognize the importance of ongoing learning and professional development. They should be equipped with the skills and motivation to engage in continuous learning, adapt to new technologies and advancements in their field, and stay updated with current research.

Program Specific Outcome PSO (B.Sc. Geography):

After completion of this course, students are expected to learn/understand the:

PO No.	PSO
PSO1	Geographical terms, concepts, and theories and will be able to explain and find out the relation between geographical factors and processes.
PSO2	Develop and prepare various thematic maps and map reading skills.
PSO 3	How their life is related to different geographical factors such as environmental, economic, social, and cultural at the local and global scale. He/she will be able to evaluate factors such as environmental, economic, social, and cultural, with respect to spatial dimensions from a local to global scale.
PSO 4	Interpretation of thematic maps through visual and/or digital interpretation of topographic maps, weather maps, aerial photographs, and satellite images.
PSO 5	Remote sensing concepts, and techniques in various fields of earth and environment sciences.
PSO 6	Geographical distribution of the global human population and factors affecting human populations including human settlement and economic activities and transport networks. The students will be able to understand the impacts of human activities on the physical environment.

Multiple Entry and Multiple Exit options:

The multiple entry and exit options with the award of UG certificate/ UG diploma/ or three-year degree depending upon the number of credits secured;

Levels	Qualification Title	Credit Requirements		Semester	Year
		Minimum	Maximum		
4.5	UG Certificate	40	44	2	1
5.0	UG Diploma	80	88	4	2
5.5	Three Year Bachelor's Degree	120	132	6	3
6.0	Bachelor's Degree- Honours **Or** Bachelor's Degree- Honours with Research	160	176	8	4

Credit distribution structure for Three/ Four year Honors/ Honors with Research Degree Programme with Multiple Entry and Exit

F.Y. B.Sc.

Year (Level)	Sem	Major (Core). Subjects		Minor Subjects (MIN)	GE/ OE	VSC, SEC (VSE C)	AEC, VEC, IKS	CC, FP, CEP, OJT/Int, RP	Cumulative Credits/Sem	Degree/ Cumulative Cr.
		Mandatory (DSC)	Elective (DSE)							
1 (4.5)	I	DSC-1 (2T) DSC-2 (2T) DSC-3 (2P)	—	MIN-1 (2T) MIN-2 (2P)	OE-1 (2T)	SEC-1 (2T) SEC-2(1P)	AEC-1 (2T) (ENG) VEC-1 (2T) (ES) IKS (1T)	CC-1 (2)	22	UG Certificate
	II	DSC-4 (2T) DSC-5 (2T) DSC-6 (2P)	...	MIN-3 (2T) MIN-4 (2P)	OE-2 (2T)	SEC-3(2T) SEC-4(1P)	AEC-2 (2T) (ENG) VEC-2 (2T) (CI) IKS (1T)	CC-2 (2)	22	
	Cum. Cr.	12	...	8	4	6	10	4	44	
Exit option: Award of UG Certificate in Major with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor.										

S.Y. B.Sc.

Year (Level)	Sem	Subject-I (M-1) Major*		Subject-II (M-2) Minor #	Subject-III (M-3)	Open Elective (OE)	VSC, SEC (VSEC)	AEC, VEC, IKS	CC, FP, CEP, OJT/Int/RP	Cumulative Credits/Sem	Degree/ Cumulative Credit
		Mandatory (DSC)	Elective (DSE)	(MIN)							
2 (5.0)	III	DSC-7(2T) DSC-8(2T) DSC-9(2P) DSC-10(2P)	---	MIN-5(2T) MIN-6(2T) MIN-7(2P)	---	OE-3(2T)		AEC-3(2T) (MIL)	CC-3(2T) CEP(2)	22	UG Diploma
	IV	DSC-11(2T) DSC-12(2T) DSC-13(2P) DSC-14(2P)	---	MIN-8(2T) MIN-9(2P)	---	OE-4(2T) OE-5(2P)		AEC-4(2T) (MIL)	CC-4(2T) ⚙ FP(2)	22	
	Cum. Cr.	12	---	10	---	4	6	4	8	44	
	Exit option: Award of UG Diploma in Major and Minor with 88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major & Minor.										

***** Student must choose one subject as a Major subject out of M-1, M-2 and M-3 that he/she has chosen at First year
#Student must choose one subject as a Minor subject out of M-1, M-2 and M-3 that he/she has chosen at First year (Minor must be other than Major)
⚙ OJT/Internship/CEP should be completed in the summer vacation after 4th semester

T.Y. B.Sc.

Year (Level)	Sem	Subject-I (M-1) Major		Subject-II (M-2) Minor	Subject-III (M-3)	Open Elective (OE)	VSC, SEC (VSEC)	AEC, VEC, IKS	CC, FP, CEP, OJT/Int/RP	Cumulative Credits/Sem	Degree/ Cumulative Credit
		Mandatory (DSC)	Elective (DSE)	(MIN)							
3 (5.5)	V	DSC-15(2T) DSC-16(2T) DSC-17(2T) DSC-18(2P) DSC-19(2P)	DSE-1A/B (2T) DSE-2A/B (2P)	---	---	---	VSC-1(2T) VSC-2(2P)	---	OJT/Int (4)	22	UG Degree
	VI	DSC-20(2T) DSC-21(2T) DSC-22(2T) DSC-23(2T) DSC-24(2T) IKS DSC-25(2P) DSC-26(2P)	DSE-3A/B (2T) DSE-4A/B (2P)	---	---	---	VSC-3(2T) VSC-4(2P)	---	---	22	
	Cum. Cr.	24	8	---	---	---	8	---	4	44	
	Exit option: Award of UG Degree in Major with 132 credits OR Continue with Major and Minor										

Fourth Year B.Sc. (Honours)

Year (Level)	Sem	Major Core Subjects		Research Methodology (RM)	VSC, SEC (VSEC)	OE	AEC, VEC, IKS	CC, FP, CEP, OJT/Int/RP	Cumulative Credits/Sem	Degree/ Cumulative Credit
IV (6.0)	VII	DSC-27(4T) DSC-28(4T) DSC-29(4T) DSC-30(2P)	DSE-5A/B (2T) DSE-6A/B (2P)	RM(4T)	---	---	---	---	22	UG Honours Degree
	VIII	DSC-31(4T) DSC-32(4T) DSC-33(4T) DSC-34(2P)	DSE-7A/B (2T) DSE-8A/B (2P)	---	---	---	---	OJT/Int (4)	22	
	Cum. Cr.	**28**	**8**	**4**	**---**	**---**	**---**	**4**	**44**	
Four Year UG Honors Degree in Major and Minor with 176 credits										

Fourth Year B.Sc. (Honours with Research)

Year (Level)	Sem	Major Core Subjects		Research Methodology (RM)	VSC, SEC (VSEC)	OE	AEC, VEC, IKS	CC, FP, CEP, OJT/Int/RP	Cumulative Credits/Sem	Degree/ Cumulative Credit
IV (6.0)	VII	DSC-27(4T) DSC-28(4T) DSC-30(2P)	DSE-5A/B (2T) DSE-6A/B (2P)	RM(4T)	---	---	---	RP(4)	22	UG Honours with Research Degree
	VIII	DSC-31(4T) DSC-32(4T) DSC-34(2P)	DSE-7A/B (2T) DSE-8A/B (2P)	---	---	---	---	RP(8)	22	
	Cum. Cr.	**20**	**8**	**4**	**---**	**---**	**---**	**12**	**44**	
Four Year UG Honours with Research Degree in Major and Minor with 176 credits										

Sem- Semester, **DSC**- Department Specific Course, **DSE**- Department Specific Elective, **OE/GE**- Open/Generic elective, **VSC**- Vocational Skill Course, **SEC**- Skill Enhancement Course, **VSEC**- Vocation and Skill Enhancement Course, **AEC**- Ability Enhancement Course, **IKS**- Indian Knowledge System, **VEC**- Value Education Course, **T**- Theory, **P**- Practical,**CC**-Co-curricular **RM**- Research Methodology, **OJT**- On Job Training, **FP**- Field Project, **Int**- Internship, **RP**- Research Project, **CEP**- Community Extension Programme, **ENG**- English, **CI**- Constitution of India, **MIL**- Modern Indian Laguage

- Number in bracket indicate credit
- The courses which do not have practical 'P' will be treated as theory 'T'
- If student select subject other than faculty in the subjects M-1, M-2 and M-3, then that subject will be treated as Minor subject, and cannot be selected as Major at second year.

Details of S. Y. B. Sc. (Geography)

Course	Course Type	Course Code	Course Title	Credits	Teaching Hours/ Week			Marks			
					T	P	Total	Internal		External	
								T	P	T	P
Semester III, Level – 5.0											
DSC-7	DSC	GEO-DSC-231	Concept of Economic Geography	2	2	---	2	20	---	30	---
DSC-8	DSC	GEO-DSC-232	Concept of Human Geography	2	2	---	2	20	---	30	---
DSC-9	DSC	GEO-DSC-233	Practical in SOI Topographical Maps	2	---	4	4	---	20	---	30
DSC-10	DSC	GEO-DSC-234	Practical in Plane Table Surveying	2	---	4	4	---	20	---	30
MIN-5	MIN	GEO-MIN-231	Geography of Soil	2	2	---	2	20	---	30	---
MIN-6	MIN	GEO-MIN-232	Geography of Maharashtra	2	2	---	2	20	---	30	---
MIN-7	MIN	GEO-MIN-233	Practical in Soil Geography	2	---	4	4	---	20	---	30
OE-3	OE	GEO-OE-231	Water Pollution	2	2	---	2	20	---	30	---
CEP	CEP	GEO-CEP-231	Community Engagement Program	2	---	4	4	50	---	---	---
Semester IV, Level – 5.0											
DSC-11	DSC	GEO-DSC-241	Fundamentals of Remote Sensing	2	2	---	2	20	---	30	---
DSC-12	DSC	GEO-DSC-242	Fundamentals of GIS	2	2	---	2	20	---	30	---
DSC-13	DSC	GEO-DSC-243	Practical in Remote Sensing	2	---	4	4	---	20	---	30
DSC-14	DSC	GEO-DSC-244	Practical in GIS	2	---	4	4	---	20	---	30
MIN-8	MIN	GEO-MIN-241	Geography of Tourism	2	2	---	2	20	---	30	---
MIN-9	MIN	GEO-MIN-242	Practical in Tourism Geography	2	---	4	4	---	20	---	30
OE-4	OE	GEO-OE-241	Weather Forecasting	2	2	---	2	20	---	30	---
OE-5	OE	GEO-OE-242	Practical in Weather Instruments	2	---	4	4	---	20	---	30
FP	FP	GEO-FP-241	Field Project	2	---	4	4	50	---	---	---

Examination Pattern

Theory Question Paper Pattern:

- 30 (External) +20 (Internal) for 2 credits
    - External examination will be of 1½ hours duration
    - There shall be 3 questions: Q1 carrying 6 marks and Q2, Q3 carrying 12 marks each. The tentative pattern of question papers shall be as follows;
    - Q1 Attempt any 2 out of 3 sub-questions; each 3 marks
    - Q 2 and Q3 Attempt any 3 out of 4 sub-question; each 4 marks.

Rules of Continuous Internal Evaluation:

The Continuous Internal Evaluation for theory papers shall consist of two methods:

1. Continuous & Comprehensive Evaluation (CCE): CCE will carry a maximum of 30% weightage (30/15 marks) of the total marks for a course. Before the start of the academic session in each semester, the subject teacher should choose any three assessment methods from the following list, with each method carrying 10/5 marks:

i. Individual Assignments
ii. Seminars/Classroom Presentations/Quizzes
iii. Group Discussions/Class Discussion/Group Assignments
iv. Case studies/Case lets
v. Participatory & Industry-Integrated Learning/Field visits
vi. Practical activities/Problem Solving Exercises
vii. Participation in Seminars/Academic Events/Symposia, etc.
viii. Mini Projects/Capstone Projects
ix. Book review/Article review/Article preparation
x. Any other academic activity
xi. Each chosen CCE method shall be based on a particular unit of the syllabus, ensuring that three units of the syllabus are mapped to the CCEs.

2. Internal Assessment Tests (IAT): IAT will carry a maximum of 10% weightage (10/5 marks) of the total marks for a course. IAT shall be conducted at the end of the semester and will assess the remaining unit of the syllabus that was not covered by the CCEs. The subject teacher is at liberty to decide which units are to be assessed using CCEs and which unit is to be assessed on the basis of IAT. The overall weightage of Continuous Internal Evaluation (CCE + IAT) shall be 40% of the total marks for the course. The remaining 60% of the marks shall be allocated to the semester-end examinations. The subject teachers are required to communicate the chosen CCE methods and the corresponding syllabus units to the students at the beginning of the semester to ensure clarity and proper preparation.

Practical Examination Credit 2: Pattern (30+20)

External Practical Examination (30 marks):

- Practical examination shall be conducted by the respective department at the end of the semester.
- Practical examination will be of 3 hours duration and shall be conducted as per schedule.
- Practical examination shall be conducted for 2 consecutive days for 2 hr/ day where incubation conditionis required.
- There shall be 05 marks for journal and viva-voce. Certified journal is compulsory to appear for practical examination.
- External practical examination of SEC will be of 25 marks and there will be no internal exam for SEC practical.

Internal Practical Examination (20 marks):

- Internal practical examination of 10 marks will be conducted by department as per schedule given.
- For internal practical examination student must produce the laboratory journal of practicals completed along with the completion certificate signed by the concerned teacher and the Head of the department.
- There shall be continuous assessment of 30 marks based on student performance throughout the semester. This assessment can include quizzes, group discussions, presentations and other activities assigned by the faculty during regular practicals. For details refer internal theory examination guidelines.
- Finally 40 (10+30) marks performance of student will be converted into 20 marks.

Semester III

S.Y. B.Sc. Geography (Major)
Semester-III
GEO-DSC-231: Concept of Economic Geography

Total Hours: 30 **Credits: 2**

Course Objectives	• Understand the fundamental concepts and scope of Economic Geography. • Analyze the factors influencing economic activities. • To acquaint the students with prospects and problems of agriculture, industries, trade and transport. • To aware the students with natural resources available and need of conservation and protection.	
Course Outcomes	After successful completion of this course, students are expected to: • Demonstrate a comprehensive understanding of the key principles, theories, and practices of economic geography. • Apply critical thinking to analyze and evaluate the economic development. • Identify and propose sustainable strategies and practices to mitigate the negative impacts of economic activities and enhance its positive contributions. • Develop proficiency in formulating effective economic policies& management.	
Unit	**Topic Particular**	**Hours**
Unit I	**Introduction to Economic Geography** • Meaning and definition of economic geography • Concept of Economic Geography. • Nature and scope of economic geography • Approaches of economic geography • Importance of Economic Geography.	07
Unit II	**Economic Activity** • Definition of economic activities. • Characteristics of Economic activities. • Types of Economic Geography. o Primary Activities o Secondary Activities o Tertiary activities o Quaternary activities	08
Unit III	**Agriculture** • Role of agricultural: seeds, fertilizers, irrigation, pesticides, power, capital, machinery in agriculture development. • Concepts of land capability and agricultural productivity. • Agricultural revolutions green revolution, white revolution and blue revolution	08
Unit IV	**Theories in economic geography** • Webar's theory of industrial location. • Rostow's model of economic development.	07
Study Resources	• **Sidhharth, K.** 2006: Economic Geography: Theories, Processes and Patterns. Kisalaya Publications, New Delhi. • **A Das Gupta**. 1975: Economic and Commercial Geography. A Mukherji and Co.	

	Pvt., Kolkata. • **Goh Cheng Leong and G. C. Morgan.** 1988: Human and Economic Geography. Oxford University Press, Hong Kong. • **T. C. Sharma.** 2009: Economic and Commercial Geography of India. Vikas Publishing House Pvt. Ltd. Patil V. J. Sandanshiv, L. P. and Jangle P. P. (2017). Economic Geography of India, Prashant Publication, Jalgaon. • **Shelar, S. K.** 2016: Principles of Economic Geography. Chandralok Publication. • **Thomon, Conkling and Yeats.** 1974: Geography of Economic Activity.McGraw Hill, New York. .

S.Y. B.Sc. Geography (Major)
Semester III
GEO-DSC-232: Concept of Human Geography

Total Hours: 30 **Credits: 2**

Course Objectives	• To understand the key definitions, nature, and scope of Human Geography, including its branches and approaches. • To explore the concept of race, its physical basis, and the classification of world races. • To analyze the evolution of major world religions and the distribution of major languages in India. • To study the cultural and geographical characteristics of various tribes, including the Eskimos, Budaun, Masai, Gond, Naga, and Bhils.	
Course Outcomes	After successful completion of this course, students are expected to: • Understand the fundamental concepts, scope, and branches of human geography, including key approaches such as determinism and possibilism. • Recognize and classify human races based on physical characteristics, focusing on major racial groups in the world. • Analyze the evolution and global distribution of major world religions and the regional distribution of major languages in India. • Explore the cultural and geographical characteristics of various indigenous tribes.	
Unit	**Topic Particular**	**Hours**
Unit I	**Introduction** • Definitions, Nature and Scope of Human Geography. • Branches of Human Geography • Approaches to the study of Human Geography • Determinism and Possibilism • Stop and Go Determinism	07
Unit II	**The Race of Mankind** • Meaning and definition of race • Physical basis of Racial groups • Classification of World Races • (Caucasoid, Mongoloid, Negroid)	08
Unit III	**Religion and Languages** • Distribution of religion in the world: o Hindu o Muslim o Buddhist o Christian • Major Languages in India and their distribution	08
Unit IV	**The Life of world Tribes** • Eskimos • Budaun • Masai	07

	• Gond • Naga • Bhils	
Study Resources	• **BeaujeuGarnier J.** – Geography of Poluation, Longman Group Ltd. • **Chandna R. C.** Rep.2010: A Geography of Population, Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi • **Clark J. I.** 1973: – Population Geography, Pergamon Press Ltd., Oxford • **Clark J. I.** Geography of Population Approaches and Applications, Pergamon Press Ltd., Oxford • **Michel Chisholm** – Studies in Human Geography. • **Singh, R. L.** Reading in Rural Settlement Geography • **Singh, J. and Dhillon** 1984: Agricultural Geography. • **Liendsor, J. M.** 1997: Techniques in Human Geography, Routledge. • **Morgan. W.B. & S.C. Monton** 1971 – Agricultural Geography Methuen, London. • **Singh. J. and Dhillon S.S.** 1994 – Agricultural Geography. Tata McGraw Hill, Publishing Co. Ltd. • **Bhaise S. D. and Mhaski D. A** – Loksankhya Bhugol (Marathi Medium) : Atharva Publication, Jalgaon • **Bhaise S. D. and Mhaski D. A** – Medical Geography (Marathi Medium) : Atharva Publication, Jalgaon	

S.Y. B.Sc. Geography (Major)
Semester-III
GEO-DSC-233: Practical in SOI Topographical Maps

Total Hours: 60 **Credits: 2**

Course Objectives	• To understand and use S.O.I. topographical maps and their types. • To learn to interpret grid references, conventional signs, and contour patterns. • To assess and interpret topographical maps for different regions and seasons. • To study weather maps, signs, symbols, and various weather instruments.	
Course Outcomes	After successful completion of this course, students are expected to: • Gain proficiency in reading and interpreting S.O.I. topographical maps. • Master grid referencing and understanding conventional map symbols. • Analyze geographical features in various regions using topographical maps. • Interpret weather maps and understand the functions of key weather instruments.	
Sr. No.	**Topic Particular**	**Hours**
1	Introduction to S.O.I topographical maps.	**4**
2	Types of topographical maps	**4**
3	Million sheets (4x4 degrees), Degree sheets (1x1 degree)	**4**
4	Half-degree sheets, and Quarter-degree sheets	**4**
5	New series of Maps	**4**
6	Index numbers (international world map series)	**4**
7	Grid reference: Four figure grid	**4**
8	Grid reference: Six figure grid	**4**
9	Convectional signs and symbols	**4**
10	Relief representation by Contour patterns	**4**
11	Interpretation of topographical map of Mountainous region	**4**
12	Interpretation of topographical map of Plateau region	**4**
13	Interpretation of topographical map of Plain region	**4**
14	Interpretation of topographical map of Coastal region	**4**
15	Interpretation of topographical map of Desert region	**4**
Study Resources	• **Arjun,K**. 2000: PratyakshikBhugol.SumeruPrakashan, Dombivali. • **Ahirrao, D. Y. &Karanjkhele, E. K**. 2002.Pratyakshik Bhugol Sudhershan Prakashan, Nashik. • **Singh, G.** 2008: Map work and practical geography. Vikas Publishing House pvt. ltd, New Delhi. • **Mishra, R. P. and Ramesh, A.** 1986: Fundamental of Geography. Concept publication, New Delhi. • **Singh, R. L. and Kanauja,.**1970: Map work and practical geography. Central book depot, Alahabad.	

S.Y. B.Sc. Geography (Major)
Semester-III
GEO-DSC-234: Practical in Plane Table Surveying

Total Hours: 60 **Credits: 2**

Course Objectives	• To understand the principles, instruments, and procedures of plane table surveying. • To learn various methods of plane table surveying and their applications in different zones. • To identify the merits, demerits, and potential errors in plane table surveying. • To develop skills in conducting field surveys and writing comprehensive report.	
Course Outcomes	After successful completion of this course, students are expected to: • Acquire knowledge of plane table surveying techniques and equipment. • Enhance the different surveying methods like radiation, intersection, and traverse. • Evaluate the advantages, limitations, and common errors in plane table surveys. • Conduct effective field surveys and prepare detailed survey reports.	
Sr. No.	**Topic Particular**	**Hours**
1	Introduction Plane Table Survey	**4**
2	Instrument use in Plane Table Survey	**4**
3	Procedure of plane table surveying	**4**
4	Merits and Demerits and errors at during of surveying	**4**
5	Methods of plane table survey	**4**
6	Radiation method (in built-up zoon)	**4**
7	Radiation method (in Agriculture zone)	**4**
8	Intersection method (in built-up zoon)	**4**
9	Intersection method (in Agriculture zone)	**4**
10	Travers method	**4**
11	Travers method: Close Traverse method	**4**
12	Travers method: Open Travers method	**4**
13	Resection Method (in built-up zoon)	**4**
14	Resection Method (in Agriculture zone)	**4**
15	Field survey and report writing	**4**
Study Resources	• **Bygott, j.**1955: Map work and practicalGeography.5 the Edition. • **Davis, R.E. and Foote**, F.s.1953: surveying, McGraw-Hill Book Co. New York. • **Deshpande, G.B.**1991: surveying, Evrest publishing house, pune. • **Kale. R.G.and Walvekar, G.V**.1980: survying parts I. • **Kanatkar T.P. and Kulkarni S.V.** survying and leveling, part I.pune vidyarthi Griha Prakashan, pune. • **Khan M.Z.a**.1998, Text book of Practical Geography, concept publishing company, New Delhi. • **Sing & Dutta**. Map work and Practical Geography. • **Sing R.L. & Singh R.P.B,** 1993: Elements of Practical Geography Kalyani publisher, New Delhi. • **Steers J, A.**1993: A study of Map Projections.	

S.Y. B.Sc. Geography (Minor)
Semester-III
GEO-MIN-231: Geography of Soil

Total Hours: 30 **Credits: 2**

Course Objectives	• To understand the definition, nature, and scope of soil geography. • To learn the processes and factors of soil formation and the concept of soil profile. • To identify the physical and chemical properties of soil and classify different soil types. • To know the causes and effects of soil degradation and methods of soil conservation.	
Course Outcomes	After successful completion of this course, students are expected to: • Gain knowledge of the fundamentals and approaches of soil geography. • Analyze the processes and factors influencing soil formation and profiles. • Differentiate soil properties and apply soil classification systems. • Evaluate soil erosion, degradation issues, and implement conservation techniques.	
Unit	**Topic Particular**	**Hours**
Unit I	**Introduction** • Definition of Soil Geography • Nature & Scope of Soil Geography • Approaches to the Study of Soil Geography o Pedagogical Approach o Edapological Approach	8
Unit II	**Soil Formation & Soil Profile** • Processes of Soil Formation o Weathering &Pedogenesis Processes o Carbonation o Humification o Laterisation o Calcification o Podzolisation • Factors Responsible for Soil Formation o Parent Rock o Precipitation o Temperature o Biological Factors: Plants, Animals & Micro Organisms o Soil Profile: Meaning & Concept. Temperature o Biological Factors: Plants, Animals & Micro Organisms • Soil Profile: Meaning & Concept.	6
Unit III	**Soil Properties and Classification** • Soil Physical Properties o Soil Structure o Soil Texture o Soil Colour o Soil Moisture o Soil Temperature	8

	• Chemical Properties of Soil ○ Soil pH ○ Soil Solution • Soil Classification ○ Zonal Soil ○ Azonal Soil ○ Intra Zonal Soil	
Unit IV	**Soil Degradation & Conservation** • Soil Erosion: Meaning, Causes and Effects • Soil Degradation: Soil Salinization • Soil Conservation: Meaning & Methods of Soil Conservation.	8
Study Resources	• **Miller A.A., Turk L.M. & Forth,** Fundamentals of Soil Science • **(Nikhil) K.D. Kolkatta,** Soil Geography, SarkarHimanshu • **Daji J.A.** ; Tata Mc Grow Hill, A Text Book of Soil Science, Mumbai • **Biswas T.D.&Mukharji**, Tata Mc Grow Hill, A text book of Soil Science, Mumbai • **James G. Cruikshant** ; Newtone Abbot Devon,Soil Geography • **Buntice B.T,** Soil Geography • Hutchinson, London,Bunting: Geography of Soils • **Rode A. A. ,** Soil science • **Briggs David**, Soils, Butterworth, London • **Birkland P.,** Weathering Pedology and Geo-morphological Research.	

S.Y. B.Sc. Geography (Minor)
Semester-III
GEO-MIN-232: Geography of Maharashtra

Total Hours: 30 **Credits: 2**

Course Objectives	• To understand Maharashtra's geography, administrative divisions, and neighboring Stats. • To acquaint the student with basic information of physical aspects of Maharashtra State. • To know the climatic condition of Maharashtra State. • To acquaint the student with the resources available in Maharashtra.	
Course Outcomes	After successful completion of this course, students are expected to: • Gain knowledge of Maharashtra's geographical and administrative landscape • Student will familiar with prospective of Maharashtra. • Familiarize with the atmospheric characteristics of the Maharashtra State. • Student enhance his knowledge for doing research on Maharashtra's problem and futuristic development plan for Maharashtra	
Unit	**Topic Particular**	**Hours**
Unit I	**Introduction** • Geographical Personality of Maharashtra • Historical Background • Location, Extend and Boundaries • Administrative Division • Geological setup	06
Unit II	**Physiography and Drainage** • Major physiographic Division of Maharashtra- o Konkan o Maharashtra Plateau o Western Ghats o Other Hilly Ranges • Major Rivers of Maharashtra and their tributaries o East flowing Rivers o West flowing Rivers	08
Unit III	**Climate, Soil and Natural Vegetation of Maharashtra** • Climate of Maharashtra • Soils • Natural Vegetation • Wildlife Sanctuaries • Types and Problems of Agriculture	08
Unit IV	**Minerals, Resource and Industries** • Introduction • Production and Distribution of Minerals	08

	○ Iron ore ○ Bauxite ○ Cole • Industries ○ Cotton Textile ○ Sugar ○ Tourism	
Study Resources	• **C. D. Deshpande**: Geography of Maharashtra • **Dr. S. M. Bhamare** 2013: Geography of Maharashtra, Prashant Publication, Jalgaon. • **Jaymala Diddee, S. R. Jog, V. S. Kale, V. S. Datye**: Geography of Maharashtra • **K. R. Dixit**: Maharashtra in Maps • **Savadi and Keche**: Maharashtra • **R. L. Sing** 2012: India: A Regional Geography, National Geographical Society of India • **Santosh Dasthane**: Maharashtra. (Marathi Medium) • **Subhash Chandra Sarang**: Maharashtra Bhugol, Vidya Prakashan, Nagpur. (Marathi Medium) • **Dr. Jaykumar Magar** Maharashtracha Bhugol. (Marathi Medium) • **Dr. S. D. Bhaise, Dr. D. A. Mhaski**: Maharashtracha Prakrutik Bhugol, Atharva Publication, Jalgaon (Marathi Medium) • Government of India.: The Gazetteer of India, Vol. I & II, Publication Division, New Delhi, 1965. • Government of India: Census of India 2011. • **Sharma, and Coutinho**, Economic and Commercial Geography of India. Vikas Publishing House, India, 1998. • **Negi, B. S.:** Economic and Commercial Geography of India, Kedarnath Ram nath, New Delhi. • **Tirtha, Ranjit.** 2002: Geography of India, Rawat, Jaipur. • Tata McGraw Atlas: Socio Economic Atlas of India. • **Majid Hussain** 2014: Geography of India, McGraw Hill Education (India) Private education, New Delhi.	

S.Y. B.Sc. Geography (Minor)
Semester-III
GEO-MIN-233: Practical in Soil Geography

Total Hours: 60 **Credits: 2**

Course Objectives	• To understand the concept and methods of soil sampling. • To learn techniques for determining soil texture, moisture, bulk density, and specific gravity. • To investigate soil chemical properties such as pH, calcium, and nutrient content. • To study the soil analysis in agriculture for crops like cotton, maize, wheat, and sugarcane.
Course Outcomes	After successful completion of this course, students are expected to: • Gain skill in various soil sampling techniques. • Accurately measure soil physical properties and analyze soil grain size. • Evaluate chemical properties of soil and their implications for soil health. • Implement soil analysis results to optimize agricultural practices for specific crops.

Sr. No.	Topic Particular	Hours
1	Concept of Soil and soil Sampling	4
2	Type and Methods of Soil Sampling	4
3	Sampling By Using Soil Augur	4
4	Sampling By Core Tubes	4
5	Collection and Processing of Soil Sample before analysis	4
6	Determination of Soil Texture and Soil Moisture	4
7	Determination of Bulk Density and Specific Gravity	4
8	Determination of Percentage Porosity	4
9	Mechanical Analysis of Soil Grain size analysis	4
10	Determination of Chemical Properties Calcium, PH and Total dissolved salts	4
11	Determination of Chemical Properties Electronic conductivity, Available Nitrogen, Potassium, Phosphorus	4
12	Determination of Chemical Properties, Nitrogen, Sulphur Magnesium	4
13	Application in Agriculture for Following Crops Cotton, Maize	4
14	Application in Agriculture for Following Crops Wheat, Sugarcane	4
15	Field survey and report writing	4

Study Resources	• **Backman, H.O and Brady, N.C.** 1960.**:** The Nature and Properties of Soils, McMillan New York, • **Bennet, Hugh H**.: Soil Conservation, McGraw Hill, New York . • **Bunting, B.T**.: The Geography of Soils, Hutchinson, London, 1973. • **Clarke G.R**. 1957: Study of the Soil in the Field, Oxford University Press, Oxford. • **Foth H.D. and Turk, L.M**. 1972: Fundamentals of Soil science, John Wiley, New York. • **Govinda Rajan, S.V. and Gopala Rao, H.G**.: Studies on Soils of India Vikas, New Delhi, 1978. • **Ghosh R. K. and Swain S**. 1993: Practical Agricultural Engineering Vol. I &II.,Naya Prakash, Calcutta. • **Raychoudhuri, S.P**. 1958: Soils of India, ICAR, New Delhi. • **Russell, Sir Edward J**. 1961: Soil Conditions and Plant Growth, Wiley, New York. • **Suresh R**1997**:** Soil & Water Conservation Engineering Standard Publishers & Distributors.

S.Y. B.Sc. Geography (Open Elective)
Semester-III
GEO-OE-231: Water Pollution

Total Hours: 30 **Credits: 2**

Course Objectives	• To understand different types and sources of water pollution. • To study the impact of water pollution on humans, the environment, and agriculture. • To explore various categories of water pollution and their characteristics. • To learn about advanced technologies and methods for controlling water pollution.	
Course Outcome	After successful completion of this course, students are expected to: • Identify and classify types and sources of water pollution. • Assess the effects of water pollution on health, ecosystems, and agriculture. • Differentiate between point source, non-point source, and trans boundary pollution. • Implement effective water pollution control measures like bioremediation and riparian buffers.	
Unit	**Topic Particular**	**Hours**
Unit I	**Introduction to Water Pollution** • Type of Water Pollution • Ocean water pollution • Surface water pollution • Ground water pollution	**8**
Unit II	• Sources of Water Pollution o Urbanization. o Deforestation. o Industrial effluents. o Agricultural run-offs- Use of insecticides and pesticides • Categories of water pollution o Point source pollution o Non-Point source pollution o Trans boundary	**8**
Unit III	• Effects of Water Pollution. o On Human o On Environment o On Agriculture	**6**
Unit IV	• Control Measures of Water Pollution • New Technologies to Prevent Water Pollution o Bioremediation o Phytore mediation o Riparian Buffers	**8**
Study Resources	• **K. Tripathi A** : Water Pollution: Ashish Pub., New Delhi • **Melanie Ostopowich** 2006: Water Pollution Weigl Publishers, New York, • Edited by **Jiri Hrubec** 1995: Water Pollution:, published by Springer Berlin Heidelberg,	

	• Edited by **Tarek A. Kassim** 2005**:** Water Pollution, published by Springer-Verlag, • **P.K. Goel** 2006: Water Pollution: Causes, Effects and Control, published in • Edited by **Pardeep Singh, Rishikesh Singh, Vipin Kumar Singh, and Rahul Bhadouria**, 2021: Pollutants and Water Management: Resources, Strategies, and Scarcity.

S.Y. B.Sc. Geography (Major)
Semester-III
GEO-CEP-231: Community Engagement Program

Total Hours: 60 **Credits: 2**

Objectives

- To engage students in activities that promote emotional, social, and intellectual growth, fostering a well-rounded approach to personal and academic development.
- To provide hands-on experiences that complement classroom learning, enabling students to apply their knowledge in socioeconomic problems of real-world.
- To instill a sense of responsibility towards the community by encouraging students to actively participate in social and environmental initiatives, appreciate rural culture, lifestyle, and wisdom.

Learning Outcomes

After completing this course, students will be able to

- Understand rural and/or urban culture, ethos, and socioeconomic realities.
- Develop a sense of empathy with the local community while appreciating the significant contributions of local communities to society and the economy.
- Learn to value the local community wisdom and identify opportunities for contributing to the community's socioeconomic improvements.

Activities

- Conduct workshops and interactive sessions on emotional intelligence and social skills.
- Organize debates, discussions, and intellectual challenges that stimulate critical thinking and socioeconomic problem-solving using concern subject.
- Organize field visits where students can work on real-world problems, such as environmental conservation, rural and/or urban planning, or community health.
- Organize internships or service-learning opportunities with local businesses, NGOs, or government agencies.
- Facilitate project-based learning activities that require students to use their academic knowledge to develop solutions to community issues.
- Engage students in community service activities that address local social and environmental issues.
- Organize cultural exchange programs or field trips to rural areas to foster an appreciation of rural culture and wisdom.
- Facilitate collaborative projects involving students, educators, and community members to develop solutions for local challenges, promoting teamwork and collective problem-solving.
- Conduct educational sessions on the status of various agricultural and development programs and the challenges faced by vulnerable households, ensuring inclusivity and accessibility for all students.

S. No.	Module Title	Module Content	Assignment submission	Teaching/ Learning Methodology
1	**Appreciation of Rural Society**	Rural lifestyle, rural society, caste and gender relations, rural values with respect to community, nature and resources, elaboration of "soul	Prepare a map (physical, visual or digital) of the village you visited and write an essay about inter-family relations in	– Classroom discussions – Field visit – Assignment

		of India lies in villages', rural infrastructure.	that village.	
2	**Understanding rural and local economy and livelihood**	Agriculture, farming, land ownership, water management, animal husbandry, non-farm livelihoods and artisans, rural entrepreneurs, rural markets, migrant labour.	Describe your analysis of the rural house hold economy, its challenges and possible pathways to address. Circular economy and migration patterns.	– Field visit – Group discussions in class – Assignment
3	**Rural and local Institutions**	Traditional rural and community organisations, Self-help Groups, Panchayati raj institutions (Gram Sabha, Gram Panchayat, Standing Committees), Nagarpalikas and municipalities, local civil society, local administration.	How effectively are Panchayati Raj and Urban Local Bodies (ULBs) institutions functioning in the village? What would you suggest to improve their effectiveness? Present a case study (written or audio-visual).	– Classroom – Field visit – Group presentation of assignment
4	**Rural and National Development Programmes**	History of rural development and current national programmes in India: Sarva Shiksha Abhiyan, Beti Bachao, Beti Padhao, Ayushman Bharat, Swachh Bharat, PM Awaas Yojana, Skill India, Gram Panchayat Decentralised Planning, National Rural Livelihood Mission (NRLM), Mahatma Gandhi National Rural Employment Guarantee Act 2005 (MGNREGA), SHRAM, Jal Jeevan Mission, Scheme of Fund for Regeneration of Traditional Industries (SFURTI), Atma Nirbhar Bharat, etc.	Describe the benefits received and challenges faced in the delivery of one of these programmes in the local community; give suggestions about improving the implementation of the programme for the poor. Special focus on the urban informal sector and migrant households.	– Classroom – Each student selects one program for field visit – Written assignment

Note: The modules are suggestive in nature and students can opt any one activity for community engagement program and field project based on topic appropriate to their regional community context.

Some additional suggestive themes for field-based / community engagement activities are listed below:

- Management curriculum may include aspects of micro-financing in a rural context;
- Chemistry syllabus can have a component of conducting water and soil analysis in surrounding field areas;
- Political science syllabus could include a mapping of local rural governance institutions and their functioning.

- Environment education will include areas such as climate change, pollution, waste management, sanitation, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living
- Understanding panchayats and constitutional mandate of local governance
- Panchayat administration, Gram Sabha, Mahila Sabha, Gram Panchayat Development Plan (GPDP), local planning of basic services.
- Micro-finance, SHGs, system of savings and credit for local business, linkages to banks, financial inclusion.
- Rural – entrepreneurship, opportunities for small business in local communities, access to financial and technical inputs to new entrepreneurs.
- Renewable energy, access to household and community level solar and bio-mass systems for sustainable energy use.
- Participatory Monitoring and evaluation of socio-economic development programmes, and cost-benefit analysis of project proposals.
- Migrant workers' livelihood security and social services.
- Hygiene and sanitation, improving health and personal behaviours, locally manageable decentralised systems and awareness against stubble burning.
- Water conservation, traditional practices of storage and harvesting, new systems of distribution and maintenance.
- Women's empowerment, gender inequality at home, community and public spaces, safety of girls and women, access to skills, credit and work opportunities.
- Child security, safety and good parenting, nutrition and health, learning and training for child care.
- Rural Marketing, market research, designing opportunities for rural artisans and crafts, and new products based on demand assessment.
- Community Based Research in Rural Settings, undertaking research that values local knowledge, systematises local practices and tools for replication and scale-up.
- Peri-urban development of informal settlements, mapping and enumeration, design of local solutions.

Assessment:

- Readings from related literature including e-content and reflections from field visits should be maintained by each student in the form of Field Diary (20 Marks)
- Submission of assignments based on modules assignment submission (details mentioned above) (20 Marks)
- Oral/ Group discussion/ Presentation (10 Marks)

Semester IV

S.Y. B.Sc. Geography (Major)
Semester IV
GEO-DSC-241: Fundamentals of Remote Sensing

Total Hours: 30 **Credits: 2**

Course Objectives	• To understand the basic concepts of remote sensing. • To explore various types of platforms and sensors used in remote sensing. • To learn about different types of satellites and their applications. • To develop skills in the visual interpretation of satellite imagery.	
Course Outcomes	After successful completion of this course, students are expected to: • Understand the principles of remote sensing techniques. • Analyse energy interactions in the atmosphere and with Earth's surface features. • Identify Earth surface features using satellite images. • Understand the properties and applications of various satellite data.	
Unit	**Topic Particular**	**Hours**
Unit I	**Principles Remote Sensing& Laws of Radiation:** • Concept • History and Development • Stages of Remote Sensing • Brief Review of Electromagnetic Radiation • Theories of EMR o Concept of Blackbody o Laws of Radiation: o Planck's law, Wien's Law, Stefan Boltzmann law, Kirchhoff's Law	8
Unit II	**Interaction with Atmosphere and Earth's Surface** • EMR interaction with Atmosphere- o Scattering o Absorption o Reflection • EMR Interaction with Earth's Surface o Features- Reflection o Emission o Transmission	8
Unit III	**Type of remote Sensing & Basic Geometric Characteristics** • Type of remote Sensing o Types of Platform o Types of Sensors o Cameras and Satellite Orbits • Geometric Characteristics Aerial photographs o Projection o Tilt o Swing o Scale o Resolution	8

Unit IV	**Satellite Image interpretation** • Satellite image visualization: gray scale image, true color and false color composites • Image interpretation: Introduction, visual and digital interpretation methods, elements of image interpretation: tone, texture, pattern, shape, size, shadow and association	6
Study Resources	**Marathi Medium -** • **Dr. Shrikant Karlekar** 2007: "Bhougolic Mahiti Pranali" Diamond Publication Pune. • **Dr. Shrikant Karlekar** 2007: "Dursavedan" Diamond Publication Pune. • **Dr. D. S. Suryawanshi** 2018: "Geoinformatics" Prashant Publications, Jalgaon. • **Dr. D. S. Suryawanshi and Dr. S. C. Ahire** 2019: Geoinformatics, Prashant Publication, Jalgaon **English Medium -** • **Bhatta, Basudeb** 2011: Remote Sensing and GIS, Oxford University Press, New Delhi. • **Jensen, J.R.** 2000: Remote Sensing of the Environment: An Earth resource Perspective. Prentice Hall. • **Joseph George,** 2003: Fundamentals of remote sensing. Universities Press • **Lillesand, T.M., and Kieffer, R.M.,** 1987: Remote Sensing and Image Interpretation, John Wiley. • **Sabbins, F.F.,** 1985: Remote sensing Principles and interpretation. W.H. Freeman & company • American society for Photogrammetry and Remote Sensing, 1999, Remote Sensing for the Earth Sciences, Manual of Remote Sensing,3rd ed., vol. 3, Wiley, New York.	

S.Y. B.Sc. Geography (Major)
Semester-IV
GEO-DSC-242: Fundamentals of GIS

Total Hours: 30 **Credits: 2**

Course Objectives	• To understand the basic concepts, components, and historical development of GIS. • To learn about spatial data models, including raster and vector models, and their advantages and disadvantages. • To know the fundamentals of attribute data management and the role of DBMS in GIS. • To explore modern trends and applications of GIS in various fields.	
Course Outcomes	After successful completion of this course, students are expected to: • Comprehend the principles and importance of GIS. • Differentiate between raster and vector data models and their applications. • Manage and utilize attribute data using DBMS within GIS. • Apply GIS techniques and tools to solve real-world problems across various disciplines.	
Unit	**Topic Particular**	**Hours**
Unit I	**Introduction of GIS:** • Introduction, meaning and definitions • Basics of GIS • Components • GIS Tasks • Importance of GIS • Historical background & development of GIS	7

Unit II	**Spatial Data Model**
	• Introduction
	• Stages of GIS data modelling
	• Raster data models
	  o Field based raster model
	  o Simple raster arrays
	  o Hierarchical raster structures
	  o Types of raster GIS models
	• Vector data model
	  o Object based vector data model
	  o Field based vector model
	• Raster versus vector
	  o Advantages and disadvantages raster and vector models
		8

Unit III	**Attribute data management**
	• Introduction
	• Concept of database and DBMS
	• Advantages of DBMS
	• Functions of DBMS
	• File and data access
	• Database models
	  o Hierarchical Database Models
	  o Network Systems
		7

	○ Relational Database Models	
Unit IV	**Modern trends in GIS and applications** • Introduction • Local to global concept in GIS • Increase in dimensions in GIS • Development of common techniques in GIS • Integration of GIS and remote sending • Applications of GIS in different fields	8
Study Resources	• **Basudeb, Bhatta.** 2011: Remote Sensing and GIS. 2nd ed., Oxford University Press. • **C. P. Lo & Albert K. W. Yeung.** 2002: Concepts and techniques of Geographic Information System. Prentice Hall, India. • **Chanda, B.,Dattaa, D., Mujumdar** 2001: Digital Image Processing and Analysis. Prentice- Hall of India. • **Demers, M. N. ed., John Wiley & Sons** 2008: Fundamentals of Geographic Information Systems. 2nd. • **Michael, F. Goodchild,.** 2002: Introduction to Geographic Information System and Science, John Wiley & Sons. • **Kang- Tsung Chang.** 2002: Introduction to Geographical Information System.McGraw Hill. • **P. A. Burrough& R.A. McDonnell,** 2000: Principles of Geographical Information System. Oxford University Press. • **Roy P. S.** 2000: Geographical Information Science, Vol. I, IIRS.	

S.Y. B.Sc. Geography (Major)
Semester-IV
GEO-DSC-243: Practical in Remote Sensing

Total Hours: 60 **Credits: 2**

Course Objectives	• To learn the basics of aerial photography. • To study interpretation techniques for aerial photographs. • To understand the basics of satellite imagery. • To study the elements of satellite imagery interpretation.	
Course Outcomes	After successful completion of this course, students are expected to: • Understand the fundamentals of aerial photography. • Apply interpretation techniques to aerial photographs. • Recognize various types of satellite images and their applications. • Develop skills in interpreting satellite imagery.	
Sr. No.	**Topic Particular**	**Hours**
1	Definition and Concept, History, significance of Aerial Photographs	4
2	Importance of Aerial photograph, Types of Aerial photographs	4
	Geometric calculations	
3	Calculation Photo Scale and Focal length	4
4	Calculation of Flying Height and Height from object	4
5	Calculation of flight line and overlap region	4
6	Stereoscopic Coverage • Pocket stereoscope • Mirror stereoscope	4
7	Elements of Aerial Photo Interpretation	4
8	Visual Interpretation of single image Physical (Each two)	4
9	Visual Interpretation of single image cultural (Each two)	4
10	Visual Interpretation of pairs image Physical (Each two)	4
11	Visual Interpretation of pairs image cultural (Each two)	4
12	Study of satellite image, Basic information and reference system of satellite image	4
13	spectral reflectance curves	4
	Visual interpretation of satellite images	
14	Interpretation of different resolution IRS satellite images – LISS III	4
15	Interpretation of different resolution IRS satellite images –PAN and WIFS	4

Study Resources	• **Backman, H.O and Brady, N.C**1960.: The Nature and Properties of Soils, McMillan New York. • **Bennet, Hugh H.:** Soil Conservation, McGraw Hill, New York . • **Bunting, B.T.** 1973.**:** The Geography of Soils, Hutchinson, London • **Clarke G.R.** 1957: Study of the Soil in the Field, Oxford University Press, Oxford. • **Foth H.D. and Turk, L.M.** ,1972: Fundamentals of Soil science, John Wiley, New York. • **Govinda Rajan, S.V. and GopalaRao, H.G**. 1978: Studies on Soils of India Vikas, New Delhi,. • **Ghosh R. K. and Swain S.** 1993: Practical Agricultural Engineering Vol. I &II.,NayaPrakash, Calcutta. • **Raychoudhuri, S.P**.: Soils of India, ICAR, New Delhi,1958. • **Russell, Sir Edward J.** 1961: Soil Conditions and Plant Growth, Wiley, New York, • **Suresh R.**1997: Soil & Water Conservation Engineering Standard Publishers & Distributors,.

S.Y. B.Sc. Geography (Major)
Semester-IV
GEO-DSC-244: Practical in GIS

Total Hours: 60 **Credits: 2**

Course Objectives	• To understand the process of analog to digital conversion and scanning methods. • To gain proficiency in using GIS software for georeferencing and data editing. • To learn techniques for data collection, integration, and advanced GIS analyses. • To develop skills in map making, layout generation, and report writing.	
Course Outcomes	After successful completion of this course, students are expected to: • Perform analog to digital conversion and georeferencing using GIS software. • Edit and manage GIS data, including removing errors and attaching non-spatial data. • Apply various GIS analysis techniques such as buffering, clipping, and network analysis. • Create detailed maps and layouts, and generate comprehensive GIS reports.	
Sr. No.	**Topic Particular**	**Hours**
1	Analog to Digital Conversion – Scanning methods	4
2	Introduction to GIS software	4
3	Georeferencing	4
4	GIS Entities and Feature Data Base– Point features, Line features, and Polygon features	4
5	Data Editing-Removal of errors – Overshoot & Undershoot, Snapping	4
6	Data Collection and Integration, Non-spatial data attachment working with tables	4
7	Dissolving and Merging	4
8	Clipping, Intersection and Union	4
9	Buffering techniques	4
10	Spatial and Attribute query and Analysis	4
11	Contouring and DEM	4
12	Advanced Analyses in GIS	4
13	Network analyses	4
14	Layout Generation and report	4
15	Map Making	4
Study Resources	• **Thomas M. Lillesand & Ralph W. Keifer**, 2000: Remote Sensing and image interpretation (John Wiley & sons, Inc). • **Chang, K. T.** 2008: Introduction to Geographic Information Systems,	

	Avenue of the Americas, McGraw-Hill, New York • **Environmental Systems Research Institute, Inc.** 1998: Understanding GIS: The ARC/INFO Method, ESRI Press, Redland • **Ahmed, E. L., Rabbany** 2002: Introduction to Global Positioning System, Artech House, Boston • **Kresse, W. and Danko, D.** 2002: Springer Handbook of Geographic Information, Springer Drecht, London • **Bao, J., Tsui, Y.** 2005: Fundamentals of Global Positioning System Receivers, John Wiley Sons, Inc., Hoboken

S.Y. B.Sc. Geography (Minor)
Semester-IV
GEO-MIN-241: Geography of Tourism

Total Hours: 30 **Credits: 2**

Course Objectives	• To know the role of geography in tourism • To study the classification of tourism • To study tourism in India • To study the impact of tourism	
Course Outcomes	After successful completion of this course, students are expected to: • To understand recent development in tourism • To understand the bases of tourism • To understand infrastructural facilities to develop a tourist place • To understand sustainable development in tourism industry	
Unit	**Topic Particular**	**Hours**
Unit I	• **Introduction** o Meaning and Definition of the Tourism & tourist o Importance of Geography in Tourism o Nature and Scope o Importance of tourism o Role of Geography in tourism o Recent Trends in Tourism Geography	08
Unit II	• **Classification and Recent Concepts of Tourism** o Types of Tourism o Classification based on – Nationality, Time of travel, Number of tourists, Purpose, Mode of transportation & Season o Recent Concepts of Tourism a. Agro-tourism b. Eco-tourism c. Adventure tourism	06
Unit III	• **Tourism in India** o Basic Tourism infrastructure o Case study of Himalaya – (General introduction of the Himalayas & other ranges, hill station & their tourism significance) o Desert– Jaiselmer o Coastal – Goa o Religious Tourism: Concept, Definition and Significance a) Hinduism: -- Four Dhams (Badrinath, Rameshwaram, Puri and Dwarka), Varanasi, Mathura Vrindavan, Haridwar, Vaishno Devi, Shirdi and Tirupati o E-Tourism: Introduction, Definition, Significance, DMS, Functions & Components of E-Tourism	08

	• **Impact of Tourism On-** o Economy o Socio-cultural aspects o Environment o Sustainable Development of Tourism	08
Study Resources	• Bhatia, A.K. (1991) : International Tourism Fundamentals and Practices, Sterling Publishers Pvt. Ltd., New Delhi-110016 • 2. Bhatia, A.K. : Tourism Development, Sterling Publishers Pvt. Ltd., New Delhi-110016 • Burkart and Medlik -Tourism, Past, Present and Future Heinemann, ELBS. (1981) • Cooper, Fletcher, Tourism, Principles and practices, Pitman. Publishing ,1993 • Geetanjali (2010) : Tourism Policy and Planning, ABD Publishers, Jaipur • Kaul: Dynamics of Tourism, Sterling Publishers Pvt. Ltd., New Delhi-110016 • Mill and Morrison (1992) : The Tourism system an Introductory Text , Prentice Hall • P.S. Gill: Dynamics of Tourism (4 Vols) Anmol Publication. New Delhi, • Wagh S.A. &Sonawane S.B. (2016) : Paryatan Bhugol, Atharva Prakashan, Jalgaon	

S.Y. B.Sc. Geography (Minor)
Semester-IV
GEO-MIN-242: Practical in Tourism Geography

Total Hours: 60 **Credits: 2**

Course Objectives	• To understand the activities and planning of Tourism • To introduce the students to the basic concepts in Tourism. • To understand the types of Tourism • To gain knowledge different aspects of online Tourism Geography	
Course Outcomes	After successful completion of this course, students are expected to: • Will able to plane and mange tour • Will handle basic concepts in Tourism. • have well known about types of Tourism • Have knowledge different aspects of online Tourism Geography	
Sr. No.	**Topic Particular**	**Hours**
	Introduction to tourism	
1	Introduction, basic and concept	4
2	Type and purpose of tourism	4
3	Accommodation in Tourism	4
	E-tourism	
4	Type of computer Hardware use in Tourism	4
5	Use of Software for Tourism	4
6	Data Management, Processing (using Excel)	4
	Marketing	
7	Television Marketing	4
8	Social media marketing	4
	CRS	
9	CRS for Rail Transport	4
10	Bus Booking	4
11	Hotel Booking	4
12	Airlines Booking	4
13	DIS/MIS design of MIS	4
14	Field Visit	4
15	Field survey and report writing	4

Study Resources	• **Robinson H.** (1996) A Geography of Tourism • **Bhatia A.K.,** Tourism Development, Principles and Practices: Sterling Publisher Ltd., New Delhi • **S. N. Singh** 1985: Geography of Tourism and Recreation: • **Douglas Pearce** 1987 :Tourism Today: A Geographical Analysis: • **Mathiseson A. and Wall C, Logman:** Tourism, Economic Physical and Social Impact, U.K. • **Manoj Das. :** India A Tourist Paradise: • **Gupta V.K.** Tourism in India: • **Kaul R. N :**Dynamics of Tourism:., Sterline Publisher Ltd.

S.Y. B.Sc. Geography (Open Elective)
Semester-IV
GEO-OE-241: Weather Forecasting

Total Hours: 30 **Credits: 2**

Course Objectives	• To understand the basic concepts and structure of the atmosphere. • To learn about global and local weather systems and their classifications. • To study climate change, its causes, and environmental impacts. • To acquire knowledge of weather forecasting methods and the use of weather maps.	
Course Outcomes	After successful completion of this course, students are expected to: • Understand the structure, composition, and variations within the atmosphere. • Identify and classify different weather systems and phenomena. • Analyze climate change factors and their environmental consequences. • Apply weather forecasting techniques and interpret weather maps effectively.	
Unit	**Topic Particular**	**Hours**
Unit I	• **Introduction To Atmosphere:** ○ Elementary idea of atmosphere ○ physical structure and composition ○ compositional layering of the atmosphere ○ variation of pressure and temperature with height air temperature and atmospheric pressure • **Measuring The Weather:** ○ Wind; forces, units, speed, direction, humidity, clouds and rainfall.	08
Unit II	• **Weather Systems:** ○ Global wind systems ○ air masses and fronts: classifications ○ jet streams; ○ Local Thunder storms ○ tropical cyclones: classification ○ tornadoes; hurricanes	06
Unit III	• **Climate And Climate Change** ○ Climate: its classification; ○ causes of climate change; ○ global warming and its outcomes; ○ Air pollution; aerosols, ozone depletion, acid rain, environmental issues related to climate.	08

Unit IV	• **Basics of Weather Forecasting** ○ Weather forecasting: analysis and its historical background ○ Need of measuring weather, types of weather forecasting ○ Weather forecasting methods, criteria of choosing weather station ○ Basics of choosing site and exposure; satellites observations in weather forecasting ○ Weather maps: uncertainty and predictability, probability forecasts.	08
Study Resources	• **I.C. Joshi, 3rd edition 2014:** Aviation Meteorology, Himalayan Books • The weather Observers Hand book, Stephen Burt, 2012, Cambridge University Press. • **S.R. Ghadekar,** 2001: Meteorology, Agromet Publishers, Nagpur. • **S.R. Ghadekar,** 2005: Text Book of Agrometeorology, Agromet **Publishers, Nagpur.** • **Chpraman & Hall** 1924: Charls Franklin Brooks, Why the weather**, London.** • **John G. Harvey,** 1995: Atmosphere and Ocean, The Artemis Press	

S.Y. B.Sc. Geography (Open Elective)
Semester-IV
GEO-OE-242: Practical in Weather Instruments

Total Hours: 60 **Credits: 2**

Course Objectives	• To understand the principles and types of wind measurement instruments. • To learn about temperature measurement techniques and devices. • To study the construction and working of various rain gauges and barometers. • To acquire knowledge on humidity measurement and its practical applications.
Course Outcomes	After successful completion of this course, students are expected to: • Understand and use instruments for measuring wind speed and direction. • Accurately measure temperature using various thermometers. • Operate different types of rain gauges and barometers to measure precipitation and atmospheric pressure. • Measure humidity using appropriate instruments and understand their applications in weather forecasting.

Sr. No.	Topic Particular	Hours
1	Wind, type of wind, Wind measurement by wind vanes	4
2	Anemometers: Cup Anemometer-construction & working, Measurement of wind velocity	4
3	Constants of Cup Anemometer Anemograph-Construction & Working	4
4	Temperature Measurement Temperature scales, Mercury Thermometer, Sensitivity, and accuracy	4
5	Maximum and Minimum Thermometer, Thermograph construction & working.	4
6	Rain & Types of rain gauges	4
7	Ordinary rain gauge construction, Measurement of rain, precautions,	4
8	Self-Recording rain gauge.	4
9	Rainfall data analysis	4
10	Atmosphere & Atmospheric pressure	4
11	Mercury barometer-construction& working, measurement of atmospheric pressure.	4
12	Dry and Wet bulb Thermometers-construction & working,	4
13	Measurement of humidity	4
14	Atmospheric pressure and humidity analysis	4
15	Application of Wind, temperature, Rain, Atmospheric pressure, and humidity	4

Study Resources	• **W. E. Knowles Middleton & Athelstan F.** Spilhaus Meteorological Instruments University of Toronto Press • **S. Rao & B. B.** Parulekar Energy Technology nonconventional, Renewable and Conventional Khanna Publishers • **Egbert Bookers & Rienk Van Grondelle**. Environmental Science (Physical principles and application) • **R. J. Barry & R. J. Chorley**: Atmosphere, Weather And Climate The English Language Book Society & Methuen & Co. L • **P. K. Gupta** : Methods Of Environmental analysis Of Water, Soil & Air

S.Y. B.Sc. Geography (Major)
Semester-IV
GEO-FP-241: Field Project

Total Hours: 60 **Credits: 2**

Objectives

- To provide students with practical exposure in rural and urban socioeconomic context.
- To develop students abilities to apply subject knowledge to address real world problems
- To foster critical thinking and innovative approaches to solve socioeconomic issues.

Outcomes

After completing this course, students will be able to

- Participate actively in filed projects that benefit local communities and promote sustainable development practices.
- Analyse the socio-economic data using appropriate methods showcasing improved problem-solving skills, technical proficiency.
- Demonstrate the ability to apply theoretical knowledge to real-world situations effectively and exhibit communication skills.

Course structure

The course is divided in to four probable phases

I] Orientation and preparation

- Introduce to the course, objectives and expectation
- Overview of socioeconomic development issues in rural and urban context
- Training on working methodology and data collection techniques
- Review existing literature related to topic to understand the background and context.

II] Work plan and Field visit

- Visit the potential sites to get a sense of the geographical and logistical requirements.
- Create a detailed project plan outlining the steps, timeline, resources needed, and roles of team members.
- Obtain necessary approvals (Ethical/ local authorities/organizations/communities)
- Gather materials and resources (field equipment, cameras, notebooks and supplies)
- Conduct Preliminary Survey, choose appropriate methods for data collection and analysis (e.g., surveys, interviews, observations).

III] Data collection and analysis

- Pilot test to identify issues with data collection.
- Collect data systematically, ensuring consistency and accuracy.
- Keep detailed records of all data (field notes, recordings, photographs etc)
- Organize and analyse the data (manual/ software)

IV] Interpretation and Reporting

- Interpret your findings in the context to objectives.
- Write and submit a comprehensive report detailing your methodology, findings, analysis, and conclusions. (Include visuals – Maps, charts, graphs, and photographs).
- Prepare a presentation to share findings with peers/ instructors/ community.

Assessment

- Field work participation, field note book, team work etc. (10 Marks)
- Data Collection and Analysis (15 Marks)
- Field project report (15 Marks)
- Presentation of Findings (10 Marks)

Examples of activities to be conducted under field projects

- **Biodiversity Survey**: Conduct a biodiversity survey in a local park or nature reserve, documenting plant and animal species.
- **Water Quality Testing**: Test water samples from different sources (e.g., rivers, lakes, ground water) for pollutants and compare results.
- **Soil Analysis**: Collect soil samples from various locations and analyse their composition and quality.
- **Wildlife Tracking**: Use camera traps or tracking devices to monitor and study the behaviour of local wildlife.
- **Urban Heat Island Effect**: Measure and map temperature differences in various parts of a city.
- **Land Use Mapping**: Create maps showing different land uses in a region and analyze changes over time.
- **Cultural Heritage Documentation**: Document and analyze local cultural heritage sites or practices.
- **Community Interviews**: Conduct interviews with community members to understand social dynamics and traditions.
- **Ethnographic Study**: Participate in and observe community events to gather ethnographic data.
- **Crop Yield Analysis**: Study the factors affecting crop yield in different fields or under different farming practices.
- **Sustainable Farming Practices**: Evaluate the impact of sustainable farming practices on soil health and crop productivity.
- **Community Needs Assessment**: Conduct surveys and interviews to identify the needs and concerns of a community.
- **Social Network Analysis**: Study the social networks within a community to understand relationships and influence.
- **Public Health Study**: Investigate public health issues in a community, such as access to healthcare or prevalence of diseases.
- **Infrastructure Survey**: Assess the condition and effectiveness of local infrastructure, such as roads, bridges, and buildings.
- **Renewable Energy Potential**: Evaluate the potential for renewable energy sources (e.g., solar, wind) in a specific area.
- **Water Management**: Study and improve local water management systems, including irrigation and drainage.
- **Literacy Program Evaluation**: Evaluate the effectiveness of local literacy programs and suggest improvements.
- **Educational Resource Assessment**: Assess the availability and quality of educational resources in local schools.
- **Market Analysis**: Conduct a market analysis for a local business or industry.
- **Entrepreneurship Project**: Develop a business plan for a local entrepreneurial venture
- **Cultural Mapping**: Map cultural resources and heritage sites within the community and analyze their significance.
- **Festival Documentation**: Document and analyze local festivals or cultural events, exploring their history and impact.
- **Language Survey**: Conduct a survey of languages spoken in the community and analyze patterns of language use and change.
- **Dialect Study**: Study and document local dialects or accents, exploring their features and origins.
- **Language Preservation**: Work with community members to document and preserve endangered languages or dialects.
- **Gentrification Impact Study**: Examine the effects of gentrification on local communities, including displacement and economic changes.
- **Crime and Safety Analysis**: Study crime patterns and perceptions of safety within a community.
- **Ritual and Festival Study**: Participate in and document local rituals or festivals to understand their social and cultural significance.
- **Migration Patterns Study**: Analyze migration patterns and their effects on both the sending and receiving communities.

- **Food and Culture Study**: Investigate the role of food in cultural practices and social interactions within a community.
- **Local Governance Analysis**: Study the structure and functioning of local government and its impact on the community.
- **Political Participation Study**: Analyze patterns of political participation and engagement within a community.
- **Public Policy Impact Assessment**: Evaluate the impact of specific public policies on local communities.
- **Election Study**: Analyze voting behaviour and patterns in local elections.
- **Mental Health Survey**: Conduct surveys to assess the mental health needs and resources in a community.
- **Social Behaviour Observation**: Observe and analyze social behaviours in public spaces, such as parks or markets.
- **Stress and Coping Study**: Investigate sources of stress and coping mechanisms within a community.
- **Community Support Systems**: Study the role and effectiveness of community support systems and networks.
- **Youth Development Programs**: Evaluate the impact of youth development programs on community wellbeing.
- **Educational Equity Study**: Assess disparities in educational resources and outcomes in local schools.
- **Parent and Teacher Interviews**: Conduct interviews to understand perceptions of educational quality and challenges.
- **After-School Program Evaluation**: Evaluate the effectiveness of after-school programs in supporting student development.
- **Educational Attainment Study**: Analyze factors influencing educational attainment in a community.
- **Local Economy Analysis**: Study the structure and dynamics of the local economy, including key industries and employment patterns.
- **Small Business Survey**: Conduct surveys of local small businesses to understand their challenges and successes.
- **Economic Impact of Events**: Analyze the economic impact of local events or festivals on the community.
- **Income Inequality Study**: Investigate patterns and causes of income inequality within a community.
- **Housing Affordability Analysis**: Study housing affordability issues and their impact on residents.
- **Gender Roles and Expectations**: Study gender roles and expectations within a community and their impact on individuals.
- **Women's Health Study**: Investigate issues related to women's health and access to healthcare.
- **Gender-Based Violence Survey**: Conduct surveys to understand the prevalence and impact of gender-based violence.
- **Urban Development Projects**: Study the impact of urban development projects on local communities.
- **Public Space Usage**: Analyze how public spaces are used and perceived by different community members.
- **Transportation Study**: Investigate transportation needs and challenges within a community.
- **Green Space Analysis**: Study the availability and usage of green spaces in urban areas and their impact on residents.