

P. D. E. A's
Prof. Ramkrishna More Arts, Commerce and Science
College Akurdi Pune-411044
(Autonomous)



Affiliated to

Savitribai Phule Pune University [SPPU]



B. A. With Major Geography
(Three years B. Sc. in Geography / Four Years Honors in Geography)

Choice Based Credit System-2023 Pattern
Under
Autonomy and NEP-2020

From Academic Year
2023-2024

Syllabus

F. Y. B. A., S. Y. B. A. and T. Y. B. A. With Major
Geography

Board of Studies in Geography
Department of Geography
Prof. Ramkrishna More Arts, Commerce and Science
College Akurdi Pune-411044

Rules and Regulations

1. National Credit Framework (NCrF): For creditisation and integration of all higher education qualifications leading to a certificate/ diploma/ degree with multiple entry and exit options, college will refer to National Credit Framework (NCrF) which encompasses the qualification frameworks for higher education, vocational and skill education and school education, namely National Higher Education Qualification Framework (NHEQF), National Skills Qualification Framework (NSQF) and National School Education Qualification Framework (NSEQF) respectively.

2. Structure of Four years multidisciplinary UG Programme and Five Years Integrated Multidisciplinary Master's Degree Programmes with Multiple Entry and Exit Options at Different Levels:

- (i) Students will have the flexibility to enter four years multidisciplinary Under Graduate Programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs.
- (ii) Students will get a Certificate after a One-year programme (minimum 40 Credits), a Diploma after two years (minimum 80 Credits), a Bachelor's degree after three years (minimum 120 Credits), and a Bachelor's degree with Research or Honours after Four years (minimum 160 Credits).

3. Qualification Type and Credit Requirements of Four Years Multidisciplinary Degree Programme with Multiple Entry and Exit Options

- (i) Details of qualifications, minimum credit requirements, exit credit courses, year and semester are as under:

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 Years Bachelor's degree	120	132	6	3
6.0	Bachelor's degree Honour's with Major	160	176	8	4
	Bachelor's degree Honour's with Major	160	176	8	4
7.0	Master's Degree	200	220	10	5
8.0	Ph. D.	----	-----	-----	----

- (ii) An exit 6-credit bridge course(s) lasting two months, including at least 6-credit job specific internship/apprenticeship that will help the graduates acquire job-ready competencies required to enter the workforce will be an additional requirement for the award of the undergraduate Certificate/ Diploma/ three-year Bachelor's Degree.
- (iii) On exit, the students will have the option to re-enter the programme in the college, or in a different higher education institution. Re-entry at various levels for lateral entrants in academic programmes should be based on the earned and valid credits as deposited and accumulated in the Academic Bank of Credits (ABC) through Registered Higher Education Institutions (RHEI) and proficiency test records.

- (iv) Eligibility for admission to the fourth year of four-year **Honours with Research Degree Programmes** as per UGC guidelines: Minimum CGPA of 7.5 or minimum 75% at three-year degree.
- (v) PG curriculum, as illustrated below, have flexibility a) One-year Post-Graduate Diploma (PGD), b) Two-year Post-graduate Programme and c) 5 Years Master's degree programmes with multiple Entry and Exit options at different levels.
- (a) Post-Graduate Diploma (PGD):** Programme duration- One year (2 semesters) after any bachelor's degree, min. 40 credits
- (i) UGC: 1-Year (2 semesters) Post-Graduate Diploma (PGD) after 3-years Bachelor's degree: Level 6.0
- (ii) UGC: 1-Year (2 semesters) PGD after 4 years Bachelor's degree (Honors/ Research): Level 6.5
- (b) Master's Degree:**
- (i) UGC: 2-Years (four semesters) Master's Degree after obtaining a 3-years Bachelor's degree, Minimum 40 credits/year, second year devoted entirely to research, PG – 2nd year: Level 6.5
- OR**
- (i) 1-Year (two semesters) Master's Degree after obtaining a 4-year Bachelor's degree (Honours/Research): Minimum 40 credits: Level 6.5
- (c) Level 8 represents Ph. D. Research Degree.
- (d) A 5-year Integrated Bachelor's and Master's programme shall have a minimum of 220 credits.
- (e) Master's and doctoral programmes, while providing rigorous research-based specialization, should also provide opportunities for multidisciplinary work, in academia, government, research institutions, and industry.

4. Lateral Entry/ Re-entry at higher Levels after exit from lower levels of four years multidisciplinary UG degree programme:

- (i) The credit points earned and accumulated shall be used to determine the eligibility for taking admission to various programs at multiple levels, subject to fulfilment of the broad principles laid down under NCrF. Students who leave with a Certification, Diploma, or a Basic Bachelor's Degree will be eligible to re-enter the programme at the exit level to complete or progress to the next level through lateral entry mode. Depending upon the academic and physical facilities available, the State Universities/ Autonomous Colleges (Higher Education Institutions or HEI) may earmark specific seats/ intake for lateral entry into the second year/ third year/ fourth year of a four years multidisciplinary UG degree programme as approved by Professional Standard Setting Bodies (PSSB/Govt. of Maharashtra/ statutory council of affiliating University plus any consequential vacancies caused by exits to an ongoing programme (four-year Degree Programme and Integrated Master's or second year Master's). Lateral entry or Re-entry is open to those students if he/she has either –
- (a) successfully completed the first year/second year/third year of the particular four years multidisciplinary degree programme in any ABC registered HEI with valid credits in ABC and re-entering into the second year/third year/fourth year, respectively of the same four years degree programme of any ABC registered HEI, within stipulated/ permissible period of years as decided by Statutory Councils of that HEI
- OR**
- (b) Already successfully completed a multidisciplinary four-year first-degree programme and is desirous of and academically capable of pursuing another multidisciplinary four years first-degree programme in an allied subject.
- (ii) A student will be allowed to enter/re-enter only at the odd semester. Re-entry at various levels for lateral entrants in academic programmes should be based on the earned and valid credits as deposited and accumulated in Academic Bank of Credits (ABC) through Registered Higher Education Institutions (RHEI) and proficiency test records. However, in terms of the admission eligibility requirements, the student shall belong to the same faculty/ discipline

in terms of Major Subject i.e., the Major subject of his earlier Programme and the Major subject of the new Programme for which he is seeking admission must be from the same faculty/discipline. Reservation for lateral entry will be executed as per the Government of Maharashtra norms.

5. Distribution of Credits across Multidisciplinary Four Years Degree Programme:

- (i) Four-year multidisciplinary degree programme with Honours/ Specialization Degree will have Internship and Core /Major Courses with a minimum of 22 credits per sem. in the Fourth Year.
- (ii) Four-year multidisciplinary degree programme with Research will have Research Projects, Seminars, Dissertations and Internships with a minimum of 22 credits per Sem. in the Fourth Year.
- (iii) Students shall select a 'Major or Core Subject/ Discipline' and a '**Minor Subject/Discipline**' **from the lists of various Subject Combinations and Options provided the Colleges.** In general, for the four years multidisciplinary bachelor's degree programme, the distribution of credits will be as follows:
 - (a) Disciplinary/interdisciplinary Major/ Core Subject (minimum of 68 credits)- Mandatory and Elective Courses
 - (b) Disciplinary/interdisciplinary Minor Subject (maximum of 22 credits)
 - (c) Skill based/Vocational studies corresponding to the Major/ Core Subject (8 credits)
 - (d) Field projects/internship/apprenticeship/community engagement and service corresponding to the Major/ Core Subject (14-22 credits) with a maximum of six credits per Semester
 - (e) Generic/ Open Electives through Baskets of Elective Courses (12 credits),
 - (f) Ability Enhancement Courses including Languages, Literature and Environmental Studies (12 credits),
 - (g) In-built modules on the Indian Knowledge System (IKS) in Major/ Core Subject at Level 4.5 – 2 credits
 - (h) Value-based Education, Life Skills and Professional Ethics: Co-curricular Courses such as Sports and Culture, NSS/NCC and Fine/ Applied/Visual Arts (8 credits).

Student can earn some credits (SEC/VSC/GE/OE) in the form of online from-

- (i) The National Skills Qualifications Framework (NSQF) organizes qualifications for Vocational and Skill Courses in a series of 8 levels based on professional knowledge, professional skills, core skills and responsibilities, in the increasing order of complexity and competency.
- (ii) University Grants Commission (Credit Framework For Online Learning Courses through Study Webs of Active-Learning for Young Aspiring Minds) Regulations, 2021, **permits up to 40 per cent of the total courses being offered in a particular programme in a semester through the Online Learning Courses offered through the Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM) platform.**

6. Examination and Assessment Process:

- (i) The basic principle of the credit framework is that credits are a function of the successful completion of a program of study/ vocational education/ training and assessment. No credit can be earned by the student unless the student is assessed for the achievement of the desired competencies and outcome of a program.
- (ii) Exit options are provided with certification, diploma and basic Bachelor's degrees to the students at the end of the second, fourth and sixth semesters of a four years multidisciplinary degree programme. Students will receive a Bachelor's degree with Honours/ Research on successfully completing of all eight semesters of the UG Program either at a stretch or with opted exits and re-entries.
- (iii) For the smooth success of four-year multidisciplinary degree programme with multiple entry and exit systems, the examination mode will be based on the combination of innovative trends in formative (informal and formal tests administered during the learning process) and summative (evaluation of students learning at the end of an instructional unit) examination modes. This is in line with the UGC Report on 'Evaluation Reforms in Higher Educational Institutions (2019)'.

(iv) Evaluation of each student in each course will be done as follows

- a. Each theory or practical course will be of 2 credits = 50 marks
- b. Internal evaluation 30% weightage (15 marks)
- c. External evaluation 70% weightage (35 marks)
- d. Students should secure 40% marks in each type of evaluation for successful completion of a course (student should secure at least 6 marks in internal and 14 marks in external evaluation).

(v) Evaluation Pattern.

- a. Internal evaluation** - Two written test, each of 20 marks will be conducted i. e. two tests on two modules. 1st assignment after completing 6 weeks of teaching and 2nd on completion of 13th week of teaching. 5 marks out of 15 will be assigned from these written tests. Remaining 10 marks will be assigned from other types of evaluation such as seminars, orals, poster presentation, open book challenging tests, surprise test, objective test etc. Examination (Internal and external) will conduct so that CO, PO, PSO can be evaluated.
- b. External Evaluation** - External evaluation will be done at the end of each semester.
 - i. For theory, 35 marks written examination will be conducted and time of examination will be 2-hours.
 - ii. For practical, 35 marks practical examination will be conducted and time of examination will be 4-hours.
 - iii. For project / field project, 35 marks evaluation will done on the basis of viva-voce and examination of thesis by the examiners.
 - iv. For OJT 35 marks evaluation will be done on the basis of report of industrial mentor / supervisor / industry and viva-voce. However, student has to produce and submit OJT certificate from competent authority of industry.

7. Attendance: The student must have at least 70% attendance, to appear any type of examination.

8. Declaration of Results:

- (i) Declaration of result is based on the Semester Grade Point Average (SGPA) earned towards the end of each semester or the Cumulative Grade Point Average (CGPA) earned at the completion of all eight semesters of the programme and the corresponding overall alpha-sign or letter grades as given in Table 2. If some candidates exit at the completion of the first, second or third year of the four years Undergraduate Programmes, with Certificate, Diploma or Basic Degree, respectively, then the results of successful candidates at the end of the second, fourth or sixth semesters shall also be classified on the basis of the CGPA obtained in the two, four, six or eight semesters, respectively. Successful candidates at the end of the tenth semester of the integrated Master's Degree Programmes shall also be classified on the basis of CGPA obtained in the ten semesters of the Programmes. Likewise, the successful candidates of one year or two semesters Master's Degree Programme are also classified on the basis of the CGPA of two semesters of the Master's Degree Programme.

Table-2: Grades on degree certificate/mark sheet will be assigned to the students as per the following table

Semester GPA/ Program CGPA Semester/Program	% of Marks	Alpha-Sign / Letter Grade Result
9.00-10.00	90-100	O (outstanding)
8.00 - <9.00	80.00 – <90.00	A+ (Excellent)
7.00 - <8.00	70.00-<80.00	A (Very Good)
6.00 - <7.00	60.00-<70.00	B+ (Good)
5.50 - <6.00	55.00-<60.00	B (Above Average)
5.00 - <5.50	50.00-<55.00	C (Average)
4.00 - <5.00	40.00-<50.00	P (Pass)
Below 4.00	< 40	F (Fail)
Ab	-----	Absent

- (ii) A student obtaining Grade F shall be considered failed and will be required to reappear in the examination. For non-credit courses 'Satisfactory' or 'Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

9. Award of Major and Minor Degree:

- (i) A student pursuing four-year multidisciplinary UG programme will be awarded an appropriate Honours/ Research degree in Major/ Core Subject on completion of VIII Semester with the minimum of 176 credits if he secures in that Subject at least 50% of the total credits for that programme. He shall thus study the specific number of Mandatory Core Courses, Core Electives, Vocational and Skill Courses and Field projects/ Internships connected to Core Subjects in eight semesters so as to cover at least 50% of the total credits.
- (ii) In case of Research Degree, a student shall pursue research project and write dissertation in that Major in the VII and VIII semesters.

On the basis of above rules and regulations under NEP-2020 following course frame work is adopted by the Prof. Ramkrishna More Arts, Commerce and Science College, Akurdi, Pune-411044 for the completing of four years honours degree in Major and Minor subjects.

10. Distribution of Credits across Four Years Degree Programmes:

In general, for the four years' bachelor's degree programme, the distribution of credits will be as follows:

(a) Major (Core) Subject comprising Mandatory and Elective Courses:

- i. Minimum 50% of total credits corresponding to Three/Four - year UG Degree- Mandatory Courses offered in all Four years;
- ii. 2 credit courses on Major Specific IKS shall be included under Major;
- iii. Elective courses of Major will be offered in the third and/or final year.
- iv. Vocational Skill Courses, Internship/ Apprenticeship, Field Projects, Research Projects connected to Major first to fourth year.

(b) Minor Subject: 18-20 Credits

- i. The Minor subjects may be from the different disciplines of the same faculty of DSC Major (Core) or they can be from different faculty altogether.
- ii. The credits of Minor subjects shall be completed in the first three years of UG Programme.

(c) Generic/ Open Elective Courses (OE): 10-12 credits

- i. It is to be offered in I and/or II year
- ii. Faculty-wise baskets of OE shall be prepared by University/ Autonomous Colleges.
- iii. OE is to be chosen compulsorily from faculty other than that of the Major.

(d) Vocational and Skill Enhancement Courses (VSEC): 14-16 credits

Vocational Skill Courses (VSC): 8-10 credits, including Hands on Training corresponding to the Major and/or Minor Subject:

- i. To be offered in first to three years;
- ii. Wherever applicable vocational courses will include skills based on advanced laboratory Practicals of Major

Skill Enhancement Courses (SEC): 06 credits

- i. To be offered in I and II year;
- ii. To be selected from the basket of Skill Courses approved by University/ Autonomous Colleges

(e) Ability Enhancement Courses (AEC), Indian Knowledge System (IKS) and Value Education Courses (VEC): 14 Credits

• **AEC: 08 credits**

- i. To be offered in I and II year
 - ii. English: 04 Credits
 - iii. Modern Indian Language: 04 credits
 - iv. To be offered from the Basket approved by the College;
- The focus for both languages should be on linguistic and communication skills.

• **IKS: 2 Credits**

- i. To be offered in I Year

ii. Courses on IKS to be selected from the basket of IKS courses approved by the Colleges

- **VEC: 04 Credits**

i. To be offered in I year

ii. Value Education Courses (VEC) Environmental Science Education (Compulsory), Understanding India, and Digital and Technological Solutions.

(f) Field Projects/ Internship/ Apprenticeship/ Community Engagement and Service corresponding to the Major (Core) Subject, Co-curricular Courses (CC) and Research Project

- **Internship/Apprenticeship corresponding to the Major (Core) Subject: 8 Credits**

- **Field Projects/Community Engagement and Service corresponding to the Major (Core) Subject: minimum 4-6 credits**

To be offered in II, and III years of UG Degree Programmes.

- **Co-curricular Courses (CC) such as Health and Wellness, Yoga education sports, and fitness, Cultural Activities, NSS/NCC and Fine/ Applied/ Visual/ Performing Arts: 8 credits.** To be offered in I and/or II year

- **Research Projects: 12 credits**

To be offered in the final year for 4-year Honours with Research UG Degree

The UGC Regulations, 2021 permit up to 40% of the total courses being offered in a particular programme in a semester through the Online Learning Courses offered through the SWAYAM platform and/or other State Level Common Platforms which can be developed in due course with the participation of different Universities/ HEIs.

Abbreviations: Generic/ Open Electives: **GE/OE**; Vocational Skill and Skill Enhancement Courses: **VSEC**; Vocational Skill Courses: **VSC**; Skill Enhancement Courses: **SEC**; Ability Enhancement Courses: **AEC**; Indian Knowledge System: **IKS**; Value Education Courses: **VEC**; **OJT**: On Job Training; Internship/ Apprenticeship; Field projects: **FP**; Community engagement and service: **CEP**; Co-curricular Courses: **CC**; Research Methodology-**RM**; Research Project: **RP** Note: The Credit Distribution Table given above is illustrative only. The Universities/ Autonomous Colleges may suitably modify within the broader framework of credit distribution across six verticals.

11. Definitions:

i. One semester = 15 weeks

ii. 1-credit theory = 15 hours i.e. for 1 credit, 1 hour per week teaching is to be performed.

15 hours of 1-credit are splinted as 12 hours actual teaching + 3 hours Tutorial (Numerical problem solving sessions, revision on difficult topics, dialog on student's difficulties, and internal evaluation)

iii. 1-credit practical = 30 hours. Thus, 1 credit practical = 2 contact hours in laboratory per week. 30 hours splinted as 24 hours actual table work and 6 hours for journal competition, oral on each practical and other internal evaluation.

iv. Each theory course of any type (major, minor, VSC, VEC, OE/GE, VEC, SEC, CC, etc.) **is of 2 credits.**

v. Theory per semester: Each theory course is of 2 credits. Thus, for each theory course contact hours = 24 teaching + 6 tutorials

vi. Each practical course is of 2 credits = 60 hours per semester

a. Minimum 12 laboratory sessions will be conducted in one semester.

b. Each laboratory sessions will be of 4 hour.

Modified Structure of 2023 Pattern

P. D. E. A's.
Prof. Ramkrishna More College, Akurdi, Pune 411044
Department of Geography
Board Geography
Faculty of Science and Technology
Graduate and Honors Degree Course Framework under Autonomy as per NEP-2020 (Structure 2023)
With effect from 2023-24

Se m.	Major Courses	Major Elective Courses	Minor Courses	VSC	IKS	FP/OJT/ CEP	GE/OE	SEC	AEC	VEC	CC	Total Credits
First Year Certificate Course 2024 pattern												
I	GEOMAT-111 GEOMAT -112 GEOMAP-113	0	0	GEOVST-111	GEOI KST-111	0	1 theory / 1 Practical From Basket	GEOSEP-111	AEENT-111	VEEAT-111	CCHWT-111	22
II	GEOMAT -121 GEOMAT -122 GEOMAP -123	0	1Theory	GEOVSP-121	0	0	1 theory / 1 Practical From Basket	GEOSEP-121	AEENT-121	VEPOT-121	CCPEP-121	22
Second Year Graduate Diploma 2023 pattern												
III	GGMAT -231 GGMAT -232 GGMAP-233	0	1Theory + 1 Practical Other than Geography	GGVSP -231	0	Field Project (2 Credit) GGFPP-231	1 theory / 1 Practical From Basket	0	MAAET-231 HIAET-231	0	CCHRT-231	22
IV	GGMAT -241 GGMAT -242 GGMAP-243	0	1Theory + 1 Practical Other than Geography	0	0	Community Engagement and Service (2 Credit) GGCEP-241	1 theory / 1 Practical From Basket	GGSEP-241	MAAET-241 HIAET-241	0	CCCST-241	22
Third Year Graduate Degree 2023 pattern												
V	GGMAT -351 GGMAT – 352 GGMAP -353 GGMAP-354	GGMET -351 GGMEP-352 GGMET -351A GGMEP-352A	1Theory + 1 Practical Other than Geography	GGVSP-351	0	Research project (2 Credit) GGRPP-351	0	0	0	0	0	22
VI	GGMAT -461 GGMAT -462 GGMAP -463 GGMAP-464	GGMET -461 GGMEP-462 GGMET -461A GGMEP-462A	1Theory + 1 Practical Other than Geography		0	OJP (4 Credit) GGOJT-361	0	0	0	0	0	22

Courses Offered by Geography Department at First Year of Graduation [2023 Pattern]

Paper Code	Title	Credits
Major Semester-I		
GEOMJT-111	Physical Geography I	2
GEOMJT-112	Physical Geography II	2
GEOMJP-113	Practicals in Cartography	2
Major Semester-II		
GEOMJT-121	Human Geography I	2
GEOMJT-122	Human Geography II	2
GEOMJP-123	Interpretation of Toposheets and IMD Weather Charts	2
Minor SEM-II		
GEOMIT-121	Biogeography	2
Vocational Skill Course (VSC), SEM-I		
GEOVST-111	Fundamentals of GIS	2
Vocational Skill Course (VSC), SEM-II		
GEOVSP-121	Spatial Data Processing	2
Skill Enhancement Course (SEC), SEM-I		
GEOSEP-111	Practicals in Tourism	2
Skill Enhancement Course (SEC), SEM-II		
GEOSEP-121	Practicals in Tourism Management	2
Student can select any SEC course from the Arts basket		
GE/OE Course for SEM-I (For Science and Commerce Students)		
GEOGET-111	Introduction to GIS	2
GEOGEP-112	Practicals in Geographical Information System	2
GE/OE Course for SEM-I (For Science and Commerce Students)		
GEOGET-121	Introduction to Remote sensing	2
GEOGEP-122	Practical in remote sensing	2
Ability Enhancement Course SEM-I		
ANAET-111	ANAET-111 Basics of soft skill	2
Ability Enhancement Course SEM-II		
ANAET-121	Basics of soft skill Level II	2
Value Education Course-I		
VEEAT-111	Environmental Science	2
Value Education Course-II		
VEPOT-121	Democracy and Indian Constitution	2
Geography IKS		
GEOIKST-111	Geographical Knowledge in Ancient India	2
Co-Curricular Courses-I		
CCHWT-111	Health & Wellness-I	2
Co-Curricular Courses-II		
CCPEP-121	Physical Education	2
Minor SEM-II		
From the Basket of Minor		
GEOE Sem.-I		
From Basket of Science and Commerce		
GEOE Sem.-II		
From Basket of Science and Commerce		

Courses Offered by Geography Department at Second Year of Graduation [2023 Pattern]

Paper Code	Title	Credits
Major Semester-III		
GGMAT-231	Principle of Geomorphology	4
GGMAT-232	Fundamentals of Population and Settlement Geography	2
GGMAP-233	Basics Statistical Techniques	2
Major Semester-IV		
GGMAT-241	Principle of Climatology	4
GGMAT-242	Fundamentals of Economic Geography	2
GEOMAP 243	Surveying Techniques	2
Minor SEM-III		
GGMIT-231	Tourism Geography	4
Minor SEM-IV		
GGMIT-241	Disaster Management and Mitigation	4
Vocational Skill Course (VSC), SEM-III		
GGVSP -231	Applications of GIS	2
Skill Enhancement Course (SEC), SEM-IV		
GGSET-241	Practicals in Agrotourism	2
Student can select any SEC course from science basket		
Field Project in Geography (FP), SEM-III		
GGFPP-231	Field Project in Geography	2
Community Engagement Project (CEP), SEM-IV		
GGCEP-241	Community Engagement Project in Geography	2
GE/OE Course for SEM-III (For Science and Commerce Students)		
GGGET-231	Natural Disaster Management	2
GE/OE Course for SEM-IV (For Science and Commerce Students)		
GGGEP-241	Practicals in Natural Disaster Management	2
Ability Enhancement Courses Sem.-III		
MAAET-231/ HIAET-231	Marathi/Hindi	2
Ability Enhancement Courses Sem.-IV		
MAAET-241/ HIAET-241	Marathi/Hindi	2
Co-Curricular Courses-III		
CCHRT-231	Human Rights: An Introduction	2
Co-Curricular Courses-IV		
CCCST-241	Cyber Security	2
Minor SEM-III		
From the Basket of Minor		
Minor SEM-IV		
From the Basket of Minor		
GEOE Sem.-III		
From Basket of Science and Commerce		
GEOE Sem.-IV		
From Basket of Science and Commerce		

Courses Offered by Geography Department at Third Year of Graduation [2023 Pattern]

Paper Code	Title	Credits
Major Semester-V		
GGMAT -351	Geography of India	4
GGMAT – 352	Soil Geography	2
GGMAP -353	Practical in Physical Geography	2
GGMAP-354	Soil Geography	2
Major Semester-VI		
GGMAT -461	Geography of Maharashtra	4
GGMAT -462	Watershed credits Management	2
GGMAP -463	Practicals in Human Geography	2
GGMAP-464	Quantitative Techniques in Geography	2
Major Elective Courses Semester-V		
GGMET -351	Digital Cartography	2
GGMEP-352	Digital Cartography	2
GGMET -351A	Application of Remote sensing	2
GGMEP-352A	Application of Remote sensing	2
Major Elective Courses Major Semester-VI		
GGMET -461	Advances in GIS	2
GGMEP-462	Geographical Information Systems	2
GGMET -461A	Climate Change Vulnerability and Adaptation	2
GGMEP-462A	Climate Change Vulnerability and Adaptation	2
Minor SEM- V		
GGMIT-351	Rural Development	2
GGMIP-352	Rural Development	2
Minor SEM-VI		
GGMIT-461	Climate Change Vulnerability and Adaptation	2
GGMIP-462	Climate Change Vulnerability and Adaptation	2
Vocational Skill Course (VSC), SEM- V		
GGVSP-351	Geographical Information Systems	2
Research Project in Geography (FP), SEM- V		
GGRPP-351	Research Project	2
On Job Training Minor SEM-VI		
GGOJP-461	Individual Student OJT	4
Minor SEM- V		
From the Basket of Minor		
Minor SEM-VI		
From the Basket of Minor		

Objectives of the B.A. Geography Programme

1. To familiarize students with fundamentals concepts and principles of Geography
2. To guide students in an identification and analysis of various facets of geographical features and processes.
3. To enhance students ability in spatial analysis, relationship between people, places and environment.
4. To develop critical thinking and problem-solving skills, analytical and scientific reasoning, reflective thinking, moral & reflective awareness amongst the students.
5. To facilitate the students to learn skills of cartographic techniques, data analysis and interpretation, carrying out field work, use of Geoinformatics techniques, research projects, applications and applied studies.

Programme Specific Outcomes: B.A. Geography

- PSO 1 Demonstrate a comprehensive understanding of key geographical concepts and theories by integrating practical applications through a regional approach that highlights global, continental, national, and state contexts.
- PSO 2 Investigate the ethical considerations inherent in geographic research and recognize the environmental values vital for developing sustainable solutions.
- PSO 3 Analyze and interpret spatial relationships among places, people, and their environments to gain deeper insights into geographic dynamics.
- PSO 4 Apply geographic knowledge and skills effectively to address real-world problems and challenges in various contexts.
- PSO 5 Employ GIS, remote sensing, and cartographic techniques to accurately analyze and interpret spatial data.
- PSO 6 Evaluate geographic issues from local to global perspectives, with a strong emphasis on sustainability and responsible stewardship of resources.
- PSO 7 Exhibit expertise in designing, conducting, and presenting fieldwork and survey projects, as well as research initiatives that contribute to geographic understanding.
- PSO 8 Enhance teamwork and leadership abilities through active participation in seminars, outdoor practicals, fieldwork, and study tours.
- PSO 9 Assess the effects of human activities on the environment and propose innovative, sustainable solutions to mitigate these impacts.
- PSO 10 Develop essential professional skills for careers in various fields, including environmental management, rural development, urban planning, geospatial technologies, cartography, field survey techniques, disaster management, and tourism.

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Graduate and Honors Degree Course Framework under Autonomy as per NEP-2020
With effects from 2023-24

Semester- I Major Course

NEP-2020 First Year UG Physical Geography I

Course Code - GEOMAT-111

Course Type-Theory

No. of Credits: 02

No. of Periods: 30

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Students will be able to understand the fundamental concepts origin, shape and size of the Earth.
2. Explain various rock- types.
3. Describe agents of the denudation.
4. Understands basic terminology used to describe physical processes and landscape forms.
5. Know the different types of landforms and landscape environments.
6. Explain the movements of the interior of the earth.

Module	Topic No.	Topic	Subtopics	No. of Periods
Module-1	1	Origin, Shape and Size of the Earth,	i. Movement of the Earth- Rotation and Revolution, Effects of the movement of Earth, Coordinates. ii. Latitude, Longitude and Time. Structure of the Earth.	08
	2	Rock- types, significance	i. Rocks- Types of rocks. ii. Significance of the rocks. iii. Meaning and types of the weathering.	07
Module-2	3	Agents of the Denudation	Agents of Denudation i. Work of River ii. Work of Wind ii. Work of glaciers. (Associated Landforms of erosion, transportation and deposition)	08
	4	Movements of the interior of the earth	i. Volcanic activities. ii. Earthquakes and iii. Tsunamis	07

Reference Books:

1. B.S. Negi (1993) Physical Geography. S.J. Publication, Meerut.
2. D.S. Lal (1998) Climatology. Chaitnya publishing house, Allahabad.
3. K. Siddhartha (2001) Atmosphere, Weather and Climate. Kishalaya publication, New Delhi.
4. R.N. Tikka (2002) Physical Geography. Kedarnath Ramnath & co, Meerut.
5. Willian D. Thornbury (1997) Principle of Geomorphology. New Age International (PvtLtd.) New Delhi.

NEP-2020 First Year UG Physical Geography II**Course Code - GEOMAT-112****Course Type-Theory****No. of Credits: 02****No. of Periods: 30****Learning Outcomes:**

After the completion of course, the students will have ability to:

1. know the difference between weather and climate.
2. Understand the elements of weather and climate and its impacts at different scales.
3. Comprehend the climatic aspects and its bearing on planet earth.
4. Know the evolution of atmosphere, its composition, structure.
5. Explain the Submarine Relief of the Ocean.
6. Describe the Marine Resources and its important.

Module	Topic No.	Topic	Subtopics	No. of Periods
Module-1	1	Atmosphere	Structure and Composition of Atmosphere, Weather and Climate.	7
	2	Temperature	Atmospheric Temperature, Heat Budget of the atmosphere Atmospheric Pressure, Winds and Precipitation	8
Module-2	3	Ocean	Distribution of Land and Sea, Submarine Relief of the Ocean, Temperature and Salinity of Sea Water. Ocean Tides, Waves and Deposits, Ocean currents - Atlantic, Pacific and Indian Oceans.	7
	4	Marine Resources	Biotic, mineral and energy resources	8

References

1. B.S. Negi (1993) Physical Geography. S.J. Publication, Meerut
2. D.S. Lal (1998) Climatology. Chaitnya publishing house, Allahabad
3. K. Siddhartha (2001) Atmosphere, Weather and Climate. Kisalaya publication, New Delhi
4. R.N. Tikka (2002) Physical Geography. Kedarnath Ramnath & co, Meerut.
5. Willian D. Thornbury (1997) Principle of Geomorphology. New Age International (PvtLtd.) New Delhi

NEP-2020 First Year UG Practical in Cartography (Practical)

Course Code - GEOMAP-113

Course Type-Practical

No. of Credits: 02

No. of Practicals: 15

Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand the basic components of map and its attributes.
2. Read and prepare maps.
3. Comprehend locational and spatial aspects of the earth surface.
4. Use and importance of maps for regional development and decision making.
5. Acquire skills in map-making and spatial representation of geographical data.
6. Utilize the principles of projection and scales for map-making.

Module	Topic	Subtopics	Practicals
Module-1	Cartography	Nature and Scope	2
	Scales	Concept and application; ; Graphical Construction of Plain, Comparative and Diagonal Scales.	3
	Map Projections	Classification, Properties and Uses; Merits and Demerits of Polar Zenithal, Stereographic, Bonne's and Mercator's Projections.	3
Module-2	Topographical Map	Interpretation of a Mountain area with the help of Cross and Longitudinal Profiles. Slope Analysis – Wentworth's method	4
	Interpretation of Weather Maps	Interpretation of Weather Maps (at least one of summer, winter and monsoon seasons	3

Practical Record:

A Project File in pencil comprising one exercise each, on scale, map projection, profile, interpretation of topographic sheet and weather maps.

References:

1. Anson, R., and Ormelling F. J., (1994): International Cartographic Association: Basic Cartographic, Vol. Pregmen Press.
2. Singh, Gopal., (1998): Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad.
3. Gupta, K.K. and Tyagi V.C., (1992): Working with Map, Survey of India, DST, New Delhi.
4. Kraak, M.J., (2010): Cartography: Visualization of Geospatial Data (3rd edition), Pearson Education Ltd., London.
5. Misra, R.P., (2014): Fundamentals of Cartography (Second Revised and Enlarged Edition), Concept Publishing, New Delhi.
6. Monkhouse, F. J. and Wilkinson, H. R., (1973): Maps and Diagrams, Methuen, London.
7. Rhind, D. W. and Taylor D. R. F., (eds.) (1989): Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
8. Robinson, A. H., (2009): Elements of Cartography (6th Edition), John Wiley and Sons, New York.
9. Sarkar, A., (2015): Practical geography: A systematic approach, Orient Black Swan Private Ltd., New Delhi
10. Sharma, J. P., (2010): PrayogicBhugol(Hindi), Rastogi Publishers, Meerut.
11. Singh, R.L. and Singh R.P.B., (1999): Elements of Practical Geography, Kalyani Publishers, New Delhi.
12. Singh, R.L. & Dutta, P.K., (2012): PrayogatmakBhugol(Hindi), Central Book Depot, Allahabad
13. Singh, R.L., & Singh, Rana. P.B., (1991): PrayogtmakBhugolkeMoolTatva(Hindi), Kalyani Publishers, New Delhi
14. Steers, J.A. (1970): An Introduction to the Study of Map Projections, University of London Press, London.
15. Khan, Zulfequar Ahmad., (1998): Text book of Practical Geography, Concept Publishing Company, New Delhi.

NEP-2020 First Year UG Fundamentals of Geographical Information System

Course Code - GEOVST-111

Course Type-Theory

No. of Credits: 02

No. of Periods: 30

Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand various components and principles of GIS
2. Understand the Principles and Uses of Global Positioning System (GPS).
3. Describe GIS Data Structures.
4. Apply the Knowledge of GIS Data Analysis.
5. Construct the thematic maps using different digital layers
6. Apply GIS in various geographical studies

Modules	Topic	Subtopics	No of Periods
Module-1	Geographical Information System (GIS)	Geographical Information System (GIS): Definition and Components.	6
	Global Positioning System (GPS)	Global Positioning System (GPS): Principles and Uses.	6
Module-2	GIS Data Structures	GIS Data Structures: Types (spatial and non-spatial), Raster and Vector Data Structure.	6
	GIS Data Analysis	GIS Data Analysis: Input; Geo-Referencing	6
	Application of GIS	Application of GIS: Land Use Mapping, Forests Monitoring and Natural disasters.	6

References:

1. Bhatta, B., (2010): Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.41
2. Burrough, P.A., and McDonnell, R.A. (2000): Principles of Geographical Information System-Spatial Information System and Geo-statistics. Oxford University Press
3. Chauniyal, D.D. (2010): Sudur Samvedan evam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad
4. Gomasasca, M. A. (2009) Basics of Geomatics, Springer Science, New York
5. Heywoods, I., Cornelius, S and Carver, S., (2006): An Introduction to Geographical Information system. Prentice Hall.
6. Jha, M.M. and Singh, R.B., (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept.
7. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet (2019): Spatial Information Technology for Sustainable Development Goals, Springer.
8. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
9. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
10. Singh, R.B. and Murai, S. (1998) Space Informatics for Sustainable Development, Oxford and IBH, New Delhi.

NEP-2020 First Year UG Geographical Knowledge in Ancient India

Course Code - GEOIKT- 111

Course Type-Theory

No. of Credits: 02

No. of Periods: 30

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Student will understand and appreciate the rich heritage of Geographical Knowledge that resides in our traditions.
2. Inculcate an understanding of the Geographical Knowledge of Ancient Indians
3. Learn to appreciate the need and importance of Geographical Knowledge and concepts of Ancient Indians.

Modules	Topic	Subtopics	No of Periods
Module-1	Universe and its Origin	Universe and its Origin, Eclipses, Earth	6
	Earth	Size of Earth, Dimensions of the Earth, Latitudes and Longitudes (Akshansa and Deshantra). Cardinal Points, Origin of the earth, Earthquakes (Bhukampas)	6
			6
Module-2	Atmosphere	Atmosphere, Weather and Climate	6
	Geomorphology	Continents (Dwipas) and Mountains and Rivers.	6

References:

1. Ali, S. M. The Geography of the Purāṇas. New Delhi: People's Publishing House, 1996.
2. Gupta, P. Geography in Ancient Indian Manuscripts. Delhi: D.K. Publishing House, 1973.
3. London: George Allen and Unwin Ltd., 1951.
4. Majumdar, R. C. and A. D. Pusalker eds. The History and Culture of Indian People: The Vedic Age.
5. Maxmueller, F. Upaniṣads. Oxford, 1900.
6. Narayan, R. K. The Ramayana. Penguin Books, 1977.
7. Tripathi, M. P. Development of Geographic Knowledge in Ancient India. Varanasi: Bhartiya Vidya Prakashan, 1969.
8. https://www.academia.edu/11893889/Geographical_knowledge_of_ancient_Indians
9. https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000017GE/P001784/M027051/ET/1517478469GeographicalThoughtinIndia.pdf

Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand various components and principles of GIS
2. Construct the thematic maps using different digital layers
3. Understand the Principles and Uses of Global Positioning System (GPS).
4. Describe GIS Data Structures and apply the Knowledge of GIS Data Analysis.
5. Construct the thematic maps using different digital layers
6. Apply GIS in various geographical studies

Module	Topic	Subtopics	No of Periods
Module-1	Geographical Information System (GIS)	Geographical Information System (GIS): Definition and Components.	6
	Global Positioning System (GPS)	Global Positioning System (GPS): Principles and Uses.	6
Module-2	GIS Data Structures	GIS Data Structures: Types (spatial and non-spatial), Raster and Vector Data Structure.	6
	GIS Data Analysis	GIS Data Analysis: Input; Geo-Referencing	6
	Application of GIS	Application of GIS: Land Use Mapping, Forests Monitoring and Natural disasters.	6

References:

1. Bhatta, B., (2010): Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg, 41
2. Burrough, P.A., and McDonnell, R.A. (2000): Principles of Geographical Information System-Spatial Information System and Geo-statistics. Oxford University Press
3. Chauniyal, D.D. (2010): Sudur Samvedan evam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad
4. Gomasasca, M. A. (2009) Basics of Geomatics, Springer Science, New York
5. Heywoods, I., Cornelius, S and Carver, S., (2006): An Introduction to Geographical Information system. Prentice Hall.
7. Jha, M.M. and Singh, R.B., (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept.
8. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet (2019): Spatial Information Technology for Sustainable Development Goals, Springer.
9. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
10. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
11. Singh, R.B. and Murai, S. (1998) Space Informatics for Sustainable Development, Oxford and IBH, New Delhi.

Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand various components and principles of GIS
2. Construct the thematic maps using different digital layers
3. Understand the Principles and Uses of Global Positioning System (GPS).
4. Describe GIS Data Structures and apply the Knowledge of GIS Data Analysis.
5. Construct the thematic maps using different digital layers
6. Apply GIS in various geographical studies

Module	Topic	Subtopics	Practicals
Module-1	Geographical Information System (GIS)	Geographical Information System (GIS): Definition and Components.	3
	Global Positioning System (GPS)	Global Positioning System (GPS): Principles and Uses.	3
Module-2	GIS Data Structures	GIS Data Structures: Types (spatial and non-spatial), Raster and Vector Data Structure.	3
	GIS Data Analysis	GIS Data Analysis: Input; Geo-Referencing	3
	Application of GIS	Application of GIS: Land Use Mapping, Forests Monitoring and Natural disasters.	3

References:

1. Bhatta, B., (2010): Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.41
2. Burrough, P.A., and McDonnell, R.A. (2000): Principles of Geographical Information System-Spatial Information System and Geo-statistics. Oxford University Press
3. Chauniyal, D.D. (2010): Sudur Samvedan evam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad
4. Gomarasca, M. A. (2009) Basics of Geomatics, Springer Science, New York
5. Heywoods, I., Cornelius, S and Carver, S., (2006): An Introduction to Geographical Information system. Prentice Hall.
6. Jha, M.M. and Singh, R.B., (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept.
7. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet (2019): Spatial Information Technology for Sustainable Development Goals, Springer.
8. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
9. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
10. Singh, R.B. and Murai, S. (1998) Space Informatics for Sustainable Development, Oxford and IBH, New Delhi.

NEP-2020 First Year UG Practicals in Tourism Management

Course Code - GEOSEP-111

No. of Credits: 02

Course Type-Practical

No. of Practical: 15

Learning outcomes:

1. Analyze, understand, and innovate the deliverables of tourism sector
2. Understand the basic concept in tourism.
3. Develop and evaluate tourism policy and planning initiatives.
4. Familiarize students with tourist agencies, roles, and responsibilities.
5. Demonstrate ability to make tour packages.
6. Ability to know basic of research project in tourism practice.

Course content:

Module	Topic	Subtopics	Practicals
Module-1	Basic concept in tourism	difference between travel and tourism, types of tourism, Documentation for tourism-passport, VISA	4
	Concept of Tourism Management and Planning	Tourist Destination – Concept and Evolution Data Collection and analysis in tourism research	4
Module-2	Tour Management	Tour planning and coordination in tourism, Tour packages in the tourism industry Types of Tourist agencies	4
	Tourism Planning	Review and feedback in tour management, Different types of feedback forms, Online guest reviews and feedback form	3

References-

1. Claire Boobbyer "Tourism Planning: Basics, Concepts, Cases" by CABI publication.
2. Clare Inkson and Medlik S. "Tourism Planning: Policies, Processes, and Relationships" by (Cengage Learning EMEA)
3. Gurdeep Singh and S. P. Gupta "Tourism Management and Planning" by (Ane Books Pvt. Ltd.)
4. Guido Candela and Paolo Figini "Tourist Destination Management: Issues, Analysis, and Policies" by Routledge publication.
5. ErcanSirakaya-Turk, MuzafferUysal, and William E. Hammitt "Research Methods for Leisure, Recreation, and Tourism" by (CABI)
6. Smith, L. J. S. (2010). Practical Tourism Research, CABI, Wallingford

NEP-2020 First Year UG Environment Science (Value Education Course)

Course Code – VET 111

Course Type-Theory

No. of Credits: 02

No. of Periods: 30

MODULE-1

[12 L + 3T]

Unit 1: Introduction to environmental studies

[02 L]

- Multidisciplinary nature of Environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

Unit 2: Ecosystems

[06 L]

- Concept and structure.
- Ecosystem functions.
- Types of Ecosystem.

Unit 3: Biodiversity and Conservation

[07 L]

- India as a mega-Biodiversity nation; Endangered and endemic species of India
- Threats to Biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;
- Conservation of Biodiversity: In-situ and Ex-situ conservation of Biodiversity.

MODULE-2

[12 L + 3T]

Unit 4: Environmental Pollution

[07 L]

- Environmental pollution: types, causes, effects and controls; Air, Water, and Soil pollution.
- Solid and liquid waste management: Control measures of urban and industrial waste.

Unit 5: Environmental Programs and Policies

[08 L]

- Developed Countries, Developing Countries.
- New Environmental policy of India; Government initiatives.

References:

1. Singh R. B. (1993) Environmental Geography. Delhi, India: Heritage Publishers.
2. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
3. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
4. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
5. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
6. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
7. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
8. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi

Semester II**NEP-2020 First Year UG Human Geography I****Course Code - GEOMAT- 121****Course Type-Theory****No. of Credits: 02****No. of Periods: 30****Learning Outcomes**

After the completion of course, the students will have ability to:

1. Get comprehensive knowledge about basic concepts in human geography
2. Understand the development of human geography.
3. Understand the concept of Determinism, Possibilism, Stop and Go Determinism.
4. Understand the world human race.
5. Increasing the awareness among the student about tribes in India.
6. Describe the tribes and their distribution of in India.

Module	Topic	Subtopics	No. of Periods
Module-1	Introduction to Human Geography	i. Definitions of Human Geography ii. Nature and scope of Human Geography iii. Branches of Human Geography	08
	Development of Human Geography	i. Development of Human Geography. ii. Concepts of Determinism, Possibilism, Stop and Go Determinism.	07
Module-2	Human Races	i. Meaning and Definition of Human Race ii. Human Race in the world.	07
	Study of Indian Tribes	i. Regional Distribution of Tribes in India. ii. Tribes in Maharashtra	08

Reference Books:

1. Bergwan, Edward E: Human Geography; Culture, Connections and Landscape, Prentice Hall, New Jersey.1995.
2. Perpillou A.V. : Human Geography, Longman, London- 1986.
3. Fellman, J.L.: Human Geography—Landscapes of Human Activities. Brown and Benchman Pub., U.S.A., 1997.
4. Robinson H. : Human Geography, 1976.
5. Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
6. Perillouav : Human Geography, 1986.
7. Sawadi A. B., मानवी भूगोल: Nirali Publication, Pune.
8. Singh, K.N.: People of India, An introduction Seagull Books, 1992.
9. Michael, Can: New Patterns: Process and Change in Human Geography Nelson,1997.

NEP-2020 First Year UG Human Geography II

Course Code - GEOMAT- 122

Course Type-Theory

No. of Credits: 02

No. of Periods: 30

Learning Outcomes

After the completion of course, the students will have ability to:

1. Understand the major religions of the world.
2. Well known about the diversity of languages and religions in India.
3. Increasing the awareness among the student about literacy and Sex Ration.
4. Well known about the demographic characteristics.
5. Understand the process of Urbanization.
6. Strengthen the ability to know about agricultural activities.
7. Increasing the awareness among the student about problems of Indian agriculture.

Module	Topic	Subtopics	No. of Periods
Module-1	Human Culture	i. World's Major Religions & their distribution. ii. Distribution of Languages & Religions in India	08
	Population	i. World distribution of population. ii. Composition of Indian population (Sex Ratio and literacy)	07
Module-2	Settlements	i. Types and pattern of rural Settlements. ii. Urbanisation in India. iii. Urbanisation in Maharashtra.	08
	Agriculture	i. Types of Agriculture ii. Problems of Indian agriculture	07

Reference Books:

1. Hussin M.: Human Geography 1994.
2. Money D.S.: Human Geography.
3. Perpillou A.V. : Human Geography, Longman, London- 1986.
4. Robinson H. : Human Geography, 1976.
5. Chandna, R.C. (2010) Population Geography, Kalyani Publisher.
6. Hassan, M.I. (2005) Population Geography, Rawat Publications, Jaipur.
7. Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
8. Sumitra Ghosh (2015), Introduction of Settlement Geography. Orient Blackswan PVT Kolkata.
9. Ghosh B.N. : Fundamentals of Population Geography.
10. Mishra & Puri : Indian Economy 2004.
11. Hassan Mohammed I. : Population Geography, 2005.
12. Bhende Asha & Kanitkar Tara : Principles of Population studies.
13. Singh, R.Y. : Geography of Settlement, 1998
14. Sawadi A. B., मानवी भूगोल: Nirali Publication, Pune.

NEP-2020 First Year UG Interpretation of Toposheets and IMD Weather Charts**Course Code - GEOMAT- 123****Course Type-Practical****No. of Credits: 02****No. of Periods: 15****Learning Outcome:**

After the completion of course, the students will have ability to:

1. Understand the basic concept of Interpretation of Toposheets and IMD Weather Charts.
2. Describe SOI toposheets.
3. Explain the representation of relief features with help of contours.
4. Understand the knowledge of Toposheets Reading/Interpretation.
5. Explain weather instruments and their applications in Geographical phenomena.
6. Describe IMD weather maps.

Module	Topic	Subtopics	Practicals
Module-1	Toposheets	a. Introduction to Survey of India (SOI) toposheets, Marginal Information, Grid reference, Conventional signs and symbols b. Types of toposheets/Indexing of toposheets	2
	Methods of Relief Representation	a. Qualitative: - Hachures, Hill shading, Layer Tint b. Quantitative: - Contours, Form lines, Bench Marks, c. Spot Heights, Triangulation Mark, Relative Height (r)	2
	Representation of Relief features by Contours	a. Concave Slope, Convex Slope, Steep Slope, Gentle Slope, Terraced / Uniform b. Conical Hill, Spur, Plateau, Ridge, Saddle, Pass, Cliff & Waterfall	2
Module-2	Profile	a. Drawing and Description of Cross Profile of any Region from toposheets b. Drawing and Description of Longitudinal Profile of a Road or a River	2
	Toposheets Reading, Interpretation	Reading of SOI toposheets	3
	Weather Maps & Reading	a. Introduction to Weather Maps b. Symbols in Daily Weather Report used by India Meteorological Department (IMD) c. Isobaric pattern Cyclones, Anti cyclones, V shaped Cyclones, V Shaped Anti Cyclones, Col d. Reading of Weather Map	4

Reference:

1. Aher A.B., Chodhari A. P. & Bharambe S.N. Techniques of Spatial Analysis Prashant Publication Jalgaon 2015
2. David Unwin, Introductory Spatial Analysis, Methuen, London, 1981.
3. Gregory, S. Statistical Methods and the Geographer, Longman, London, 1978.
4. Hammond R and P.S. McCullagh Quantitative Techniques in Geography: An Introduction, Clarendon Press, Oxford, 1974.
5. John P.Cole and Cuchlaine A. M. King, Quantitative Geography, John Wiley, London, 1968.
6. Johnston R. J., Multivariate Statistical Analysis in Geography, Longman, London. 1973.
7. Koutsoyiannis, Theory of Econometrics, Mcmillan, London, 1973.
8. Maurice Yeats, An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York, 1974.
9. Aronoff S. Geographic Information Systems: A Management Perspective, DDL Publication Ottawa. 1989.
10. Burrough P.A . Principles of Geographic information Systems for Land Resource Assessment Oxford University Press, New York.1986.

11. Fraser Taylor D.R. Geographic information Systems. Pergamon Press, Oxford.1991.
12. Maquire D. J. M.F. Goodchild and D. W. Rhind (eds.). Geographic information Systems:Principles and Application. Taylor & Francis, Washington. 1991.
13. Mark S Monmonier . Computer-assisted Cartography. Prentice-Hall, Englewood Cliff, New Jersey, 1982.
14. Peuquet D.J. and D.F. Marble, Introductory Reading in Geographic Information Systems Taylor & Francis, Washington.1990.
15. Star J and J. Estes. Geographic Information Systems: An Introduction. Prentice- Hall, Englewood Cliff, New Jersey, 1994.
16. Peter HaGEOett, Andrew D. Cliff, & Allan Frey, Location Methods Vol. I and II, Edward Arnold, London, 1977.
17. Misra, R.P. and Ramesh, A. Fundamentals of Cartography, McMillan Co., New Delhi,1986.
18. Pal, S.K. Statistics for Geoscientists — Techniques and Applications, Concept, New Delhi,1998.
19. Robinson, A.H. et al.: Elements of Cartography, John Wiley & Sons, U.S.A.,1995.
20. Sarkar A.:K Practical Geography: A Systematic Approach, Oriental Longman, Calcutta, 1997.
21. Singh, R.L. and Dutt, P.K.: Elements of Practical Geography, Kalyani Publishers, New Delhi,1979
22. Choudhar A. H., Choudhari J. V. Practical Geography, K. S. Publication, Pune (2013).

NEP-2020 First Year UG Biogeography

Course Code - GEOMIT- 121

No. of Credits: 02

Course Type-Theory

No. of Periods: 30

Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand the basic concept of Biogeography.
2. Describe the dynamics of climate and related theories.
3. Explain the World Climatic Patterns.
4. Understand of Vegetation as an index of climate.
5. Understand the concepts of Biodiversity; bio-diversity hotspots, biodiversity conservation.
6. Assess of different aspects of floral and faunal provinces.

Module	Topic	Subtopics	No. of Periods
Module-1	Biogeography	Introduction to Biogeography Nature, scope, and components	7
	World Climatic Patterns	World Climatic Patterns (Koppen) in relation to biogeographical regions. Evolution of major groups of floral and faunal provinces	8
Module-2	Ecological successions	Ecological successions: stages and climax	7
	Biodiversity	Biodiversity; bio-diversity hotspots, biodiversity conservation.	8

References:

1. Bhattacharyya, N. N. (2003): Biogeography, Rajesh Publications, New Delhi.
2. Clarke, G. L. (1967): Elements of ecology, New York: John Wiley Pub.
3. Haden-Guest, S., Wright, J. K. and Teclaff, E. M. (1956): World Geography of Forest Resources, New York: Ronald Press Co.
4. Hoyt, J.B. (1992): Man, and the Earth, Prentice Hall, U.S.A.
5. Huggett, R.J. (1998): Fundamentals of Biogeography, Routledge, U.S.A.
6. Lal, D. S. 2003. Climatology, Allahabad: Sharda Pustak Bhawan.
7. Lapedes, D.N. (1974): Encyclopaedia of Environmental Science (eds.), McGraw Hill.
8. Mal, Suraj., and Singh, R.B. (Eds.) (2009): Biogeography and Biodiversity, Rawat Publication, Jaipur
9. Mathur, H.S. (1998): Essentials of Biogeography, Anuj Printers, Jaipur.
10. Mountain and Tree cover in Mountain Regions Report - 2002, UNEP-WCMC.
11. Parmesan, C., Yohe, G. (2003): A globally coherent fingerprint of climate change impacts across natural systems. Nature, 421 (6918), 37–42
12. Singh, Savindra (2015): Paryawaran Bhoogol (Hindi), Prayag Pushtak Bhawan, Allahabad (Hindi).
13. Sivaperuman, Chandrakasan et al., (2018): Biodiversity and Climate Change Adaptation in Tropical Islands, Academic Press, London.
14. Trewartha, G. T., (1980): An Introduction to Climate, McGraw Hill Company, New York.

NEP-2020 First Year UG Spatial Data Processing (Practical)

Course Code - GEOVSP-121

Course Type-

Practical

No. of Credits: 02

No. of Periods: 15

Learning Outcome:

After the completion of course, the students will have ability to:

1. Understand various components and principles of GIS
2. Understand the Principles and Uses of Global Positioning System (GPS).
3. Describe GIS Data Structures.
4. Apply the Knowledge of GIS Data Analysis.
5. Construct the thematic maps using different digital layers
6. Apply GIS in various geographical studies

Module	Topic	Subtopics	Practicals
Module-1	Geographical Information System (GIS)	Geographical Information System (GIS): Definition and Components.	3
	Global Positioning System (GPS)	Global Positioning System (GPS): Principles and Uses.	3
Module-2	GIS Data Structures	GIS Data Structures: Types (spatial and non-spatial), Raster and Vector Data Structure.	3
	GIS Data Analysis	GIS Data Analysis: Input; Geo-Referencing	3
	Application of GIS	Application of GIS: Land Use Mapping, Forests Monitoring and Natural disasters.	3

References:

1. Bhatta, B., (2010): Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.41
2. Burrough, P.A., and McDonnell, R.A. (2000): Principles of Geographical Information System-Spatial Information System and Geo-statistics. Oxford University Press
3. Chauniyal, D.D. (2010): Sudur Samvedan evam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad
4. Gomasasca, M. A. (2009) Basics of Geomatics, Springer Science, New York
5. Heywoods, I., Cornelius, S and Carver, S., (2006): An Introduction to Geographical Information system. Prentice Hall.
6. Jha, M.M. and Singh, R.B., (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept.
7. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet (2019): Spatial Information Technology for Sustainable Development Goals, Springer.
8. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
9. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
10. Singh, R.B. and Murai, S. (1998) Space Informatics for Sustainable Development, Oxford and IBH, New Delhi.

NEP-2020 First Year UG Introduction to Remote Sensing

Course Code - GEOGET-121

Course Type-Theory

No. of Credits: 02

No. of Periods: 30

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Understand the basic concept of Remote Sensing.
2. Explain Digital and manual Image Processing.
3. Develop the skill so as to use digital satellite data using software.
4. Prepare the maps based with satellite data to compare with the ground realities.
5. Classify digital data for the land use/land cover and urban studies.
6. Apply the Knowledge of Remote Sensing in Various field.

Module	Topic	Subtopics	No of Periods
Module-1	Image Processing (Digital and Manual)	Pre-processing (Radiometric and Geometric Correction); Enhancement (Filtering); Classification (Supervised and Un-supervised)	15
Module-2	Application of Digital Remote Sensing	Application of Digital Remote Sensing- Land Use /Land Cover	6
		Application of Digital Remote Sensing in Urban Studies.	4
		Application of Remote Sensing in weather (cyclones) studies and natural hazards (e.g. floods)	5

References:

1. Bhatta , B., (2008): Remote Sensing and GIS, Oxford University Press, New Delhi.
2. Campbell, J. B., (2007): Introduction to Remote Sensing, Guildford Press
3. Hord R.M.,(1989): Digital Image Processing of Remotely Sensed Data, Academic, New York.
4. Jensen, J. R., (2005): Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Prentice-Hall.
5. Jensen, J. R.,(2007): Remote Sensing of the Environment: An Earth Resource Perspective, Prentice-Hall Inc, New Jersey.
6. Joseph, G.,(2005): Fundamentals of Remote Sensing, United Press India.
7. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet.,(2019): "Spatial Information Technology for Sustainable Development Goals", Springer.
8. Li, Z., Chen, J. and Batsavias, E., (2008): Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences, CRC Press, Taylor and Francis, London
9. Lillesand, T. M., Kiefer R. W. and Chipman, J. W., (2004): Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
10. Mukherjee, S. (2004): Textbook of Environmental Remote Sensing, Macmillan, Delhi.
11. Nag, P. and Kudra, M., (1998): Digital Remote Sensing, Concept, New Delhi.
12. Richards, J. A. and JiaXiuping., (2005): Remote Sensing Digital Image Analysis: An Introduction, 4th Edition, Springer, Verlag, Berlin.

NEP-2020 First Year UG Introduction to Remote Sensing**Course Code - GEOGEP-122****Course Type-Practical****No. of Credits: 02****No. of Periods: 15****Learning Outcomes:**

After the completion of course, the students will have ability to:

1. Understand the basic concept of Remote Sensing.
2. Explain Digital and manual Image Processing.
3. Develop the skill so as to use digital satellite data using software.
4. Prepare the maps based with satellite data to compare with the ground realities.
5. Classify digital data for the land use/land cover and urban studies.
6. Apply the Knowledge of Remote Sensing in Various field.

Module	Topic	Subtopics	Practicals
Module-1	Image Processing (Digital and Manual)	Pre-processing (Radiometric and Geometric Correction); Enhancement (Filtering); Classification (Supervised and Un-supervised)	4
			4
Module-2	Application of Digital Remote Sensing	Application of Digital Remote Sensing- Land Use /Land Cover	2
		Application of Digital Remote Sensing in Urban Studies.	2
		Application of Remote Sensing in weather (cyclones) studies and natural hazards (e.g. floods)	3

References:

1. Bhatta , B., (2008): Remote Sensing and GIS, Oxford University Press, New Delhi.
2. Campbell, J. B., (2007): Introduction to Remote Sensing, Guildford Press
3. Hord R.M.,(1989): Digital Image Processing of Remotely Sensed Data, Academic, New York.
4. Jensen, J. R., (2005): Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Prentice-Hall.
5. Jensen, J. R.,(2007): Remote Sensing of the Environment: An Earth Resource Perspective, Prentice-Hall Inc, New Jersey.
6. Joseph, G.,(2005): Fundamentals of Remote Sensing, United Press India.
7. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet.,(2019): "Spatial Information Technology for Sustainable Development Goals", Springer.
8. Li, Z., Chen, J. and Batsavias, E., (2008): Advances in Photogrammetry, Remote Sensing and Spatial Information Sciences, CRC Press, Taylor and Francis, London
9. Lillesand, T. M., Kiefer R. W. and Chipman, J. W., (2004): Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
10. Mukherjee, S. (2004): Textbook of Environmental Remote Sensing, Macmillan, Delhi.
11. Nag, P. and Kudra, M., (1998): Digital Remote Sensing, Concept, New Delhi.
12. Richards, J. A. and JiaXiuping., (2005): Remote Sensing Digital Image Analysis: An Introduction, 4th Edition, Springer, Verlag, Berlin.

NEP-2020 First Year UG Practicals in Tourism Management

Course Code - GEOSEP-121

Course Type-Practical

No. of Credits: 02

No. of Practical: 15

Learning outcomes:

1. Analyze, understand, and innovate the deliverables of tourism sector
2. Understand the basic concept in tourism.
3. Develop and evaluate tourism policy and planning initiatives.
4. Familiarize students with tourist agencies, roles, and responsibilities.
5. Demonstrate ability to make tour packages.
6. Ability to know basic of research project in tourism practice.

Course content:

Module	Topic	Subtopics	Practicals
Module-1	Tourism Site Assessment	Assess a potential tourism site Destination analysis Research the destination case Study - attractions, accommodations, transportation, and other tourism related aspects	4
	Data Analysis and Reporting	Data analysis of Tourist arrivals, hotel occupancy rates, or tourism expenditure. Analyze the data using tools like Microsoft Excel or statistical software. Generate reports, create visualizations, and draw conclusions based on their data analysis.	4
Module-2	Tour Planning	Online Booking and Cancellation – Bus, Rail, flights, accommodations. Design a tour package domestic and international for market. Prepare Budget for package domestic and international Tour	4
	Field Trip	Organize a field trip to a tourism-related business such as a hotel, travel agency, or tourist attraction. Prepare a report summarizing their observations.	3

References-

1. Claire Boobyer "Tourism Planning: Basics, Concepts, Cases" by CABI publication.
2. Clare Inkson and Medlik S. "Tourism Planning: Policies, Processes, and Relationships" by (Cengage Learning EMEA)
3. Gurdeep Singh and S. P. Gupta "Tourism Management and Planning" by (Ane Books Pvt. Ltd.)
4. Guido Candela and Paolo Figini "Tourist Destination Management: Issues, Analysis, and Policies" by Routledge publication.
5. ErcanSirakaya-Turk, MuzafferUysal, and William E. Hammitt "Research Methods for Leisure, Recreation, and Tourism" by (CABI)
6. Smith, L. J. S. (2010). Practical Tourism Research, CABI, Wallingford

Semester- I IKS Course



Prof. Ramkrishna More Arts, Commerce and Science College

(Autonomous College)

Akurdi Pradhikaran, Pune 411044.

www.pdearmacs.edu.in

Course Code: GIKST-111

Course Name: A Basic Course on Indian Knowledge System

Credits: 02

Course Duration: 01 Semester

Course Aim and Objectives:

Bhārata boasts a rich and versatile knowledge system and cultural heritage that has evolved over millennia. Originating during the Vedic period and the Saraswatī-Sindhu Civilization, and continuing through the Middle Ages to modern times, the Bhāratīya knowledge system has had a profound and enduring influence. The course “A Basic Course on Indian Knowledge System “ introduced in NEP 2020 This course focuses on the historical development of ideas in ancient society, exploring their implications for understanding the material world, as well as religious, social, and cultural beliefs. Upon closer examination, it becomes evident that religion, culture, and science are epistemologically interconnected within the Bhāratīya knowledge system. Bhārata has made invaluable contributions to society and the world across various spheres, including aeronautics, astronomy, mathematics, life science, medical science, architecture, polity, trade, art, music, dance, literature, and drama. By studying these interconnected areas, one can gain a comprehensive understanding of the depth and breadth of the Bhāratīya knowledge system and its cultural heritage.

The Indian Knowledge System course is not just an academic endeavor but a vital component of holistic education. It nurtures a deeper understanding of India's intellectual traditions and their relevance in contemporary times, fostering a balanced and enriched perspective on life and knowledge.

Learning Outcomes

- Understanding the foundational concepts and principles of IKS
- Appreciating the contributions of ancient Indian scholars and scientists
- Integrating IKS perspectives into modern academic and practical contexts
- Promoting cultural awareness and appreciation of India's intellectual heritage

Course Contents

Credits: 2 (30 Hours)

UNIT -I: Bharatiya Civilization and Knowledge System (6 hours)

The primary sources of ancient Indian philosophy: Vedas and Upanishads, Overview of the six schools of Indian philosophy. Ancient Indian civilization: the discovery of the Saraswatī River and the Saraswatī-Sindhu civilization. The ancient Indian education system: Gurukul system, Takṣaśilā University, Nālandā University, and their notable alumni. History of knowledge export from Bhārata.

[प्राचीन भारतीय तत्त्वज्ञानाचे प्राथमिक स्रोत: वेद आणि उपनिषद, भारतीय तत्त्वज्ञानाच्या सहा शाळांचे सिंहावलोकन. प्राचीन भारतीय संस्कृती: सरस्वती नदीचा शोध आणि सरस्वती-सिंधू संस्कृती. प्राचीन भारतीय शिक्षण पद्धती: गुरुकुल पद्धती, तक्षशिला विद्यापीठ, नालंदा विद्यापीठ आणि त्यांच्या प्रसिद्ध माजी विद्यार्थी. भारतातून ज्ञान निर्यातीचा इतिहास.]

UNIT-II: Arts, Literature, and Scholars in Ancient India (6 hours)

The history of ancient Indian art, music, and dance. Naṭarāja a unique symbol of Indian art. In the field of literature, the works of Agastya, Ghoṣā, Vālmīki, Patañjali, Gārgī, Vedwalmiki, Lopāmudrā, Maitreyī, and Bodhāyana. In the fields of science and medicine, the contributions of Caraka, Suśruta, Jīvaka, Nāgārjuna, Kaṇāda, Patañjali, Kauṭilya, Pāṇini, Thiruvalluvar, Ādi Śaṅkarācārya, Bhāskarācārya, and Mādhavācārya

[प्राचीन भारतीय कला, संगीत, आणि नृत्याचा इतिहास. नटराज हा भारतीय कलेचा एक अद्वितीय प्रतीक. साहित्य क्षेत्रात अगस्त्य, घोषा, वाल्मीकी, पतंजली, गार्गी, वेदवाल्मीकी, लोपा मुद्रा, मैत्रेयी आणि बोधायन यांचे कार्य. विज्ञान आणि वैद्यक क्षेत्रात चरक, सुश्रुत, जीवक, नागार्जुन, कणाद, पतंजली, कौटिल्य, पाणिनी, तिरुवल्लुवर, आदि शंकराचार्य, भास्कराचार्य आणि माधवाचार्य यांचे योगदान..]

UNIT-III: Ancient Science, Astronomy, and Mathematics (6 hours) ,

Āryabhaṭa and Varāhamihira's contributions, concepts like matter, life, and gravity, technological advancements like Sage Agastya's battery model, the velocity of light, and Vimāna aeronautics. Vedic cosmology, Bhāratiya Kāla-gaṇanā, Kerala School for Mathematics and Astronomy, history and culture of astronomy, celestial bodies such as the sun, earth, moon, eclipses, earth's spherical nature and rotation, archaeoastronomy, mathematical concepts zero, pi, number system, Pythagoras theorem, and Vedic mathematics.

[आर्यभट्ट आणि वराहमिहिरांचे योगदान, पदार्थ, जीवन, आणि गुरुत्वाकर्षण या संकल्पनांचे महत्त्व, संगणकीय प्रगती, जसे की सेज अगस्त्यांच्या बॅटरी मॉडेल, प्रकाशाची वेगता, आणि विमान वायुयान, वैदिक ब्रह्मांडशास्त्र, भारतीय काल-गणना, केरळ संख्याशास्त्र आणि खगोलशास्त्राचा इतिहास व संस्कृती, सूर्य, पृथ्वी, चंद्र, ग्रहण, पृथ्वीच्या गोलाकार आणि घुमट, पुरातत्त्वशास्त्र, शून्य, पाई, संख्या प्रणाली, पायथागोरसचा प्रमेय, आणि वैदिक गणित.]

UNIT-IV: Ancient Engineering, Technology, and Architecture (6 hours)

Urban planning and sophisticated drainage systems : Mohenjo-daro and Harappa. Rock-cut architecture : Ajanta and Ellora caves, temple designs found in Khajuraho and Konark. Stepwells (Baolis): water management systems. metallurgical techniques for metal extraction and artifact crafting. Textile technology such as weaving and dyeing. Scientific instruments used for astronomical observations and calculations. Bhāskarācārya and his contributions to mathematics. Trade and Commerce in Ancient India.

[नगर योजना आणि प्रगत निर्जलीकरण प्रणाली: मोहनजो-दारो आणि हरप्पा. शिलाचित्र कला: अजंता आणि एलोरा लेण्यांची चालक शैली, खजुराहो आणि कोणार्कमधील मंदिर डिझाइन. पायराडी (बावली): पाण्याचे व्यवस्थापन प्रणाली. धातूची शैली: धातू निकालण्याची आणि अभिजात वास्तुकला. कापडी तंत्रज्ञान जसे की बुनणे आणि रंगणे. खगोलशास्त्रात वापरलेले वैज्ञानिक उपकरणे आणि गणना. भास्कराचार्य आणि त्यांचा गणितातील योगदान. प्राचीन भारतातील व्यापार आणि वाणिज्य.]

UNIT-V: Life, Environment, and Health in Ancient India (6 hours)

Ancient Indian Religions : Hinduism, Buddhism, Jainism, Sikhism : Teachings and Philosophies, Ancient agricultural practices, crop cultivation techniques, and innovations. Comprehensive healthcare systems integrating Āyurveda, yoga, and other traditional practices. Surgical techniques and procedures practiced in ancient India

[प्राचीन भारतीय धर्म: हिंदूधर्म, बौद्धधर्म, जैनधर्म, सिखधर्म: शिक्षण आणि दर्शन, प्राचीन कृषि प्रथा, फसल उत्पादन तंत्रज्ञान आणि नवीन उपक्रम. आयुर्वेद, योग आणि इतर पारंपरिक व्यवस्थांच्या संयुक्त स्वास्थ्यव्यवस्था. प्राचीन भारतातील क्षेत्रजन्य तंत्रज्ञान आणि प्रक्रिया.]

Text books:

1. History of Science in India Volume-1, Part-I, Part-II, Volume VIII, by Sibaji Raha, et al. National Academy of Sciences, India and The Ramkrishan Mission Institute of Culture, Kolkata(2014).
2. Textbook on The Knowledge System of Bhārata by Bhag Chand Chauhan,

Reference Books:

1. A History of Ancient and Early Medieval India: From the Stone Age to the 12th Century" by Upinder Singh:
2. Pride of India- A Glimpse of India's Scientific Heritage edited by Pradeep Kohle et al.Sanskrit Bharati (2006).
3. Vedic Physics by Keshav Dev Verma, Motilal Banarsidass Publishers (2012).
4. "Indian Art and Culture" by Nitin Singhanian, McGraw Hill

Semester- I Ability Enhancement Course

F. Y. B.A./F.Y.B.COM/ALL SY Semester II		
Title of the Course	Basics of Soft Skills II	Number of Credits : 02
Course Code	ENAET-121 (code for FY) ENAET-241(code for SY)	
Course Outcomes (COs) On completion of the course, the students will be able to:		
CO1	Distinguish between critical and creative thinking.	
CO2	Explore strategies for developing creative thinking for solving problems..	
CO3	Analyse the concept of self-esteem and apply it to real life.	
CO4	Examine the power of positive thinking.	
CO5	Develop interpersonal negotiation skills for resolving interpersonal conflicts.	
CO6	Identify different types of leadership and choose strategies for developing leadership.	
CO7	Apply soft skills to real life.	
Unit No.	Title of Unit and Contents	No. of Lectures
I	Creative Thinking and Problem Solving: 1. What is creative thinking? 2. Difference between critical and creative thinking 3. Importance of creative thinking in problem solving 4. Strategies for developing creative thinking for solving problems	10
II	Team Building: 1. What is a team? 2. Strategies for resolving the interpersonal conflicts 3. Developing the interpersonal negotiation skills 4. Importance and significance of effective team building	10
III	Leadership: 1. What are leadership skills? 2. Types of leadership 3. Developing leadership skills 4. Strategies for developing leadership	10

Semester- I Ability Enhancement Course

NEP-2020 First Year UG Environment Science (Value Education Course)

Course Code – VET 111

Course Type-Theory

No. of Credits: 02

No. of Periods: 30

MODULE-1

[12 L + 3T]

Unit 1: Introduction to environmental studies

[02 L]

- Multidisciplinary nature of Environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

Unit 2: Ecosystems

[06 L]

- Concept and structure.
- Ecosystem functions.
- Types of Ecosystem.

Unit 3: Biodiversity and Conservation

[07 L]

- India as a mega-Biodiversity nation; Endangered and endemic species of India
- Threats to Biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;
- Conservation of Biodiversity: In-situ and Ex-situ conservation of Biodiversity.

MODULE-2

[12 L + 3T]

Unit 4: Environmental Pollution

[07 L]

- Environmental pollution: types, causes, effects and controls; Air, Water, and Soil pollution.
- Solid and liquid waste management: Control measures of urban and industrial waste.

Unit 5: Environmental Programs and Policies

[08 L]

- Developed Countries, Developing Countries.
- New Environmental policy of India; Government initiatives.

References:

9. Singh R. B. (1993) Environmental Geography. Delhi, India: Heritage Publishers.
10. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
11. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
12. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
13. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
14. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
15. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
16. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi

Value Education Course VEC- Sem.-II;

POVET-121: Democracy and Indian Constitution

2 Credit, 30 L

Unit-1: The Concept of Democracy

- A. Meaning – Nature and Definition.
- B. Origin and Development.
- C. Types of Democracy. Direct and Indirect

Unit-2: A. Major Feature of Democracy.

- B. Social Democracy.
- C. Demerits of Democracy.

Unit-3: Making of Indian Constitution.

- A. Fundamental Rights in the Indian Constitution.
- B. Basic Structure of the Indian Constitution.

Unit: 4 A. Fundamental Duties of Citizens

- B. Election Commission of India (Electoral Reforms/ E.V.M./Code of Conduct)

English Reference Books/Text

1. An introduction to Political Theory, Author: Rajiv Bhargava Publication: Pearson.
2. Bryce, Modern Democracies.
3. E. Asirvatham, political Theory.
4. Bharatiya Rajyaghatna va Ghatanatmak prakriya, Author: Tukaram Jadhav Publication: Unique Academy Pune.
5. Introduction to the Constitution of India Author: Dr. Durga मराठी संदर्भ साधने:
 - १) डॉ. बाळ कांबळे, २०१२, भारताची राज्यघटना, राजकारण व कायदा डायमंड प्रकाशन पुणे.
 - २) पाटील बी. बी., २०१६, भारतीय शासन आणि राजकारण फडके प्रकाशन कोल्हापूर.
 - ३) डॉ. जोती बीडलन, डॉ. देशपांडे. भारतीय संविधानाचा परिचय, निराली प्रकाशन, पुणे.
 - ४) प्राचार्य. काने राजकीय सिद्धांत आणि राजकीय विचार, पिंपळापुरे प्रकाशन, नागपूर
 - ५) प्रा. प्रमोद तांबे, राज्यशास्त्र परिचय, निराली प्रकाशन, पुणे.
 - ६) डॉ. विजय देव, आधुनिक राजकीय विश्लेषण कोश, डायमंड प्रकाशन, पुणे,
 - ७) भार्गव राजीव, राजकीय सिद्धांत परिचय, अनुवाद-हेमंत खानझोडे, पीयरसन प्रकाशन.
 - ८) ना य. डोळे, राजकीय विचाराचा इतिहास, कॉन्टिनेन्टल प्रकाशन, पुणे.

PROGRAMME OUTCOMES

Political Science undergraduate program was born out of recognition of the increasing significance of cross-disciplinary studies in the social sciences. The program is organized around the combined perspectives and analytical tools of Sociology, Political Science, International Relations, and History.

1. Develop knowledge of theories, concepts, and research methods in humanities and social sciences.
2. Assess how global, national and regional developments affect society.
3. The Political Science degree furnishes the students with a unique multidisciplinary approach in social sciences and prepares them for further academic study and for careers in the public and the private sector.

Video Lecture Links

Unit 1: <https://youtu.be/fJaLKyF8Qhw?si=qhL26a4lYps9UV4C>

Unit 1 and 2 : <https://www.youtube.com/watch?v=DXcJoihea7Y>

Unit 2: <https://www.youtube.com/watch?v=GiyiyEBlpH4>

Unit 3: <https://youtu.be/XCvTZzvzh2E?si=kd4eVMXfTTf-IsAL>

Unit 4: https://drive.google.com/file/d/1v_E9q_5UwgyVXF0BcR35u2LOgYVMgYa7/view

Curricular Course; 2 Credits, 60L (Sem.-II)

CCPEP-121: Physical Education and Sports

Theory and Active Participation

- Introduction to Physical Education and Sports
- Concept of Physical Education, its Definition and Scope.
- Concept of Physical Fitness
- Components of Health Related Physical Fitness
- (Cardio-vascular Endurance, Muscular Strength, Endurance, Flexibility, and Body Composition)
- Components of Skill Related Physical Fitness (Agility, Balance, Co-ordination, Speed, Power, Reaction Time)
- Concept of Health, Wellness, and Health & Hygiene.

Fitness Assessment & Participation in Sports

In order to improve the physical fitness standards of students, they should be given opportunity and facilities to participate in Physical Fitness Activity and a game / sport from the list of Association of Indian Universities, New Delhi (List of events available on website www.aiuweb.org). The choice of game / sports will be according to the facilities available in the college.

Participation in Fitness Activity:

- Every student should participate in Fitness Activity for 12 hours.

Participation in Games and Sports:

- A student will have to select one game/sport from the list of Association of Indian Universities, New Delhi (List of events available on website www.aiuweb.org). The choice of game/sports will be according to the facilities available in the college.

Every student should participate in Games and sports for 12 hours.

Fitness Assessment:

- Cardiovascular Endurance
- Flexibility
- Muscular Strength Endurance
- Body Composition (No marks)

EVALUATION STRUCTURE:

Table 1

Course	Type of Assessment	Marks	Mode of Evaluation
COURSE – CCPEP-121 PHYSICAL EDUCATION, SPORTS	Internal Assessment	15	Assignment (15 marks) Project on the selected Sports Event
	External Assessment	35	Participation (10 marks) (24 hrs. of participation in Fitness and selected game/sport). Practical – Fitness Test- 25 marks

To complete first credit of Course - Physical Education, Sports, Teacher will have to **conduct 5 theory lectures** (college may schedule these lectures during first or second semester before fitness assessment) and student will have to attend 5 theory lectures and has to participate in Fitness and selected game / sport for **minimum 24hrs.and submit the assignment.**

- Procedure for fitness tests are given in the guidelines section which also includes Norms Table.

Marks to be awarded in accordance with the norms table.

Sr. No.	Component	Test	Marks
1	Cardiovascular Endurance (Any One)	1. Modified Queens College Test or 2. 12 Min. Run Walk	10
2	Flexibility	2. Sit and Reach Test	05
3	Muscular Strength Endurance	3. Bent Knee Sit Ups	10
4	Body Composition	4. Fat Percentage	-----
		Total	25

CONSIDERATIONS AND EXEMPTIONS:

Differently Able Students

Differently able students will be exempted from the course **CCPEP-121 PHYSICAL EDUCATION AND SPORTS** after producing the valid documents. This is not depriving them from the equality of opportunity with other students. The student shall have to submit his/her medical certificate at the time of admission from a Civil Surgeon of respective District Civil Hospital.

Important Note:

- Temporary illness will not give students exemption from the course. If he / she miss any assessment/task he / she will be given opportunity in the ensuing semester.

Exemption

Any Student representing college / institute in the enlisted games of Association of Indian Universities / Indian Olympic Association / State Olympic Association shall be **exempted from mandatory participation in selected game / sport for minimum 24hrs** of first credit of Course - **CCPEP-121** Physical Education and Sports.

PDEA's.
Prof. Ramkrishna More College, Akurdi, Pune 44
Department of Geography
Board Geography
Faculty of Science and Technology
Graduate and Honour Degree Course Framework under Autonomy as per NEP-2020
With effect from 2024-25

GGMAT-231 Principles of Geomorphology

Major Course

Semester-III

No of Credit-4

No of periods:60

Course Outcomes:

1. To learn basic concepts and theories of Geomorphology, Processes, and landforms concerning time and scale.
2. Students will have an overview of the structure and composition of the interior of the earth and development of the earth's crust and the origin and methods of development of major landforms
3. Acquire knowledge about types of folds and faults and earthquakes, volcanoes and associated landforms.
4. Understanding crustal mobility and tectonics; with special emphasis on their role in landform development.
5. To learn different types of landforms and landscape environments.
6. The course will provide an understanding of the conceptual and dynamic aspects of landform development

Modules	Topic Name	Sub-Topics	No. of Lectures
1	Geomorphology	i. Geomorphology: Nature and Scope ii. Key Concepts and Systems Approach iii. Distribution of Continents and Oceans iv. Earth: Interior Structure	10
2	Earth Movements	i. Alfred Wegener's continental drift ii. Isostasy. Plate Tectonics, iii. Earth's Movements: Endogenetic and Exogenetic forces, Sudden and Diastrophic movements- Epeirogenetic and Orogenetic Movements-Process of folding and faulting iv. Earthquakes and Volcanoes. Case Studies: Volcano, Earthquake: reporting of latest incidents	16
3	Geomorphic Processes	i. Weathering: meaning, types, and controlling factors ii. Mass Movement: meaning, controlling factors, types-landslides, rock-falls iii. Cycle of Erosion (Davis and Penck) Case Studies: landslides: reporting of latest incidents	12
4	Evolution of Landforms	(Erosional and Depositional) i. Fluvial, ii. Karst, iii. Aeolian, iv. Glacial, and v. Coastal.	12
5	Applied Geomorphology and Environment.	Application of geomorphology: in India and Maharashtra (Regional planning, Urban planning and transportation, Mining, Hazard management, Agriculture and Environmental management).	10

References:

1. Kale, V. S., & Gupta, A. (2010). Introduction to Geomorphology. Hyderabad: Universities Press.
2. Ollier, C. D. (1981). Tectonics and Landforms. London: Longman.
3. Singh, S. (2002). Geomorphology, Allahabad: Prayag Pustak Bhawan.
4. Strahler, A. H., & Strahler, A. N. (1992). Modern Physical Geography, New Jersey: John Wiley and Sons.
5. Tarbuck, E. J., & Lutgens, F. K. (2009). Earth Science. New Jersey: Prentice Hall

GGMAT-232 Course: Fundamentals of Population and Settlement Geography
Major Course **Semester-III**
No of Credit-2 **No of periods: 30**

Course Outcomes:

1. Get comprehensive knowledge about basic concepts in population and settlement geography.
2. Well-known about the population data and demographic transition.
3. Aware about the problems, prospects of population growth, and policies in India.
4. Increasing the awareness among the students about types and patterns of rural settlement.
5. Well-known about urbanization in India as well as Maharashtra state.
6. To understand the potential of major urban cities in India.
7. The student develops theoretical, applied, and computational skills.

Modules	Topic	Subtopics	No. of Periods
1	Introduction to Population Geography.	a) Introduction: i. Definition, Nature and Scope. b) Population Data & Presentation: i. Census of India ii. National Sample Survey. c) Concept and theories of Population: i. Theory of demographic transition	08
2	Population Growth, Problems and Population Policies	Population Growth, Problems and Population Policies i. Population Growth in India ii. Factors Affecting growth of Population iii. Population Problems in India. iv. Population Policies in India. v. Contemporary Issues – Ageing of Population; Declining Sex Ratio; HIV/AIDS	07
3	Introduction to Settlement Geography	Concept of Ekistics; Study on settlement hierarchies. i. Types of rural settlements: Compact, Semi-compact, and dispersed. ii. Pattern of rural Settlements	08
4	Urban Settlement	Urbanisation: i) Urbanisation in India. ii) Urbanisation in Maharashtra iii) Potential of Major Cities in India: Mumbai, Chandigarh and Kolkata. iv) Megalopolis and Ecumenopolis; Urban Green Space	07

Reference Books:

15. Hussin M.: Human Geography 1994.
16. Money D.S. : Human Geography.
17. Perpillou A.V. : Human Geography, Longman, London- 1986.
18. Robinson H. : Human Geography, 1976.
19. Chandna, R.C. (2010) Population Geography, Kalyani Publisher.
20. Hassan, M.I. (2005) Population Geography, Rawat Publications, Jaipur.
21. Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
22. Sumitra Ghosh (2015), Introduction of Settlement Geography. Orient Blackswan PVT Kolkata.
23. Ghosh B.N. : Fundamentals of Population Geography.
24. Hassan Mohammed I.: Population Geography, 2005.
25. Bhende Asha & Kanitkar Tara : Principles of Population studies.
26. Singh, R.Y. : Geography of Settlement, 1998
27. Sawadi A. B., मानवी भूगोल : Nirali Publication, Pune.
28. Singh, G., 2005. Map work and practical geography. Vikas Publishing House Pvt. Ltd., New Delhi Singh,
29. L.R. and Singh, R., 1973. Map work and practical geography, Central Book Allahabad.
30. Siddhartha, K., 2006. Geography through maps, Kishalay Publications Pvt. Ltd, Delhi.
31. Singh, R.L., and Dutt, P.K., 1968. Elements of practical geography, Students' Friends, Allahabad.
32. Steers, J.A., 1970. An Introduction to Study of Map Projections. University of London Press Ltd., London.

GGMAP-233 Course: Basic Statistical Techniques

No. of Credits: 02

No. of Practical: 15

Course Outcomes

1. Understand the basics of data collection and processing for meaningful outcomes.
2. Students will be acquainted with the Basic Statistical Techniques.
3. Students will acquire skills of Geographical Data and its Basic Analysis.
4. Students will acquire skills of Geographical Data and its Basic Analysis their advantages and limitations.
5. Comprehend the representation and interpretation of the results.
6. Put into practice results obtained in representation as well as day-to-day life.

Modules	Topic	Subtopics	Practicals
1	Geographical Data and its Basic Analysis	i. Introduction and Types of Geographical Data: i) ii. Spatial and Temporal data ii) Discrete and Continuous series iii) Grouped and Ungrouped data Basic Analysis : a. Tally marks and frequency table b. Frequency distribution (histogram & polygon) c. Cumulative Frequency and Ogive curve	03
2	Sampling	Types of sampling i. Simple random sampling ii. Systematic sampling iii. Stratified sampling iv. Clustered sampling	06
3	Calculation of Central Tendency, & Dispersion	i. Meaning and description of central tendencies- Mean, Mode, Median b. Calculation of Mean, Mode, Median for ungrouped and grouped data (two examples each) c. Measures of Dispersion: Mean Deviation and Standard Deviation (two examples each)	06

Reference Books:

1. Acevedo, M. F., 2012. Data Analysis and Statistics for Geography, Environmental Science and Engineering, CRC Press.
2. Ahirrao, D. Y. and Karanjkehele, E.K., 2002. Pratyakshik Bhugol, Sudarshan Publication, Nashik.
3. Creswell J., 1994. Research Design: Qualitative and Quantitative Approaches, Sage Publications.
4. Hammond, R. and McCullagh, P. S., 1977. Quantitative Techniques in Geography: An Introduction, Clarendon Press, Oxford.
5. Harris, R., Jarvis, C. 2011. Statistics for Geography and Environmental Science, Prentice Hall.
6. Jog, S. R. and Saptarshi, P. G., 1980. Sankhikhi Bhugol, Narendra Publication, Pune.
7. Karlekar, S. N. and Kale, M., 2006. Statistical Analysis of Geographical Data, Diamond Publication, Pune.
8. Kumbhar, A., 2000. Pratyakshik Bhugol, Sumeru Publications, Mumbai.
9. Mc Grew Jr., J. C., Lembo Jr., A. J., Monroe, C. B. 2014. An Introduction to Statistical Problem solving in Geography, 3rd ed, Waveland Press.
10. Pal. S. K., 1998. Statistical Methods for Geoscientists: Techniques and Applications, Concept Pub.co.
11. Rogerson, P. A., 2015. Statistical Methods for Geography: A Student's Guide, 4th ed, Sage.
12. Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan.
13. Singh R. L. and Dutt, P.K., 1968. Elements of Practical Geography, Students Friends, Allahabad.
14. Singh R. L., 2005. Elements of Practical Geography. Kalyani Publishers, New Delhi.

GGMIT-231 Tourism Geography

Minor Course

No of Credit-4

Semester-III

No of Periods:60

Course Outcomes:

1. To make the students aware of the significance and the influence of Geography on tourism.
2. Equip with a basic understanding of the nature and scope, trends, and patterns of various types of tourism.
3. Ability to describe the importance of geography in tourism and tourism potential hotspots in the various tourism-generating regions in India.
4. Acquire knowledge of the recent trends and patterns of tourism development in India.

Modules	Topic Name	Subtopics	Lectures
1	Introduction to Tourism Geography	Definition, Nature and Scope of Geography of Tourism, Role of Geography in Tourism Development.	15
2	Infrastructure and Support System for Tourism	Accommodation, Transport and Tour operator, Tourism services, Economic, Social, Physical and Cultural Impacts of Tourism	13
3	Theories and Tourism Potential Index	Butler's Model of Tourism Development, Doxy's Index Tourism Potential Index (TPI)	12
4	Tourism Development in India and Field visit	Environmental laws and tourism. Impact of globalization and foreign capital on tourism development. Government policies for tourism development. (ITDC, MTDC) Field visit and report writing	20

References

1. Bhatia, A. K. (1991). International Tourism - Fundamentals and Practices. New Delhi: Sterling
2. Bhatia, A. K. (1996). Tourism Development: Principles and Practices. New Delhi: Sterling Publisher Ltd.
3. Das, M. (1999). India: A Tourist Paradise. New Delhi: Sterling Publishers.
4. Lew, A. A., Hall, C. M., & Williams, A. M. (ed) (2014). Tourism. Hoboken: Wiley-Blackwell.
5. Pearce, D. G. (1987). Tourism Today: A Geographical Analysis. Harlow: Longman.
6. Robinson, H. (1996). A Geography of Tourism. London: Macdonald and Evans.
7. Smith, L. J. S. (2010). Tourism Analysis: A Handbook. Sydney: Halstead Press.

GGVST – 231 Application of GIS**No. of Credits – 02****No. of Periods – 30****Course Outcomes**

1. In-depth knowledge about application of GIS in various sectors
2. Knowledge of the mobile GIS
3. An understanding of recent trends in GIS
4. In-depth knowledge of internet GIS
5. Knowledge of the open source of GIS

Modules	Topic	Sub-topic	Periods
01	Application of GIS in various sectors	i.Introduction ii.Agriculture iii.Local Government iv.Natural resource management v.Urban planning	08
02	Mobile GIS	i.Mobile GIS- Concepts and Applications ii.Portable PCs iii.Personal Digital Assistance (PDAs) or Palm Top iv.Mobile Phone v.Arc GIS Mobile vi.Characteristics of Mobile GIS vii.Benefits of Mobile GIS	07
03	Web GIS and recent trends in GIS	i. Web GIS ii.Recent trends in GIS iii.Automated Mapping / Facilities Management iv.Virtual 3D GIS, v.OLAP	07
04	Open-source GIS	i.Application of Open-source GIS	08

Reference

1. D. Tomlin. (1990). *Geographic Information Systems and Cartographic Modeling*. USA: Prentice-Hall, Englewood Cliffs, NJ, ISBN0-13-350927-3.
2. Esperança and Samet, H. (1997). *An overview of the spatial data base system, to appear in Communications of the ACM*. (<http://www.cs.umd.edu/~hjs/pubs/sandprog.ps.gz>)
3. Heywood, I., Comelius, S., and Carver, S. (1988). *An Introduction to Geographical Information Systems*. New York , USA: Addison Wiley Longmont.
4. Samet, H. (1990). *Applications of Spatial Data Structures: Computer Graphics, Image Processing, and GIS*. USA: Addison-Wesley, Reading, MA, ISBN 0-201- 50300-0.
5. Samet, H. (1990). *The Design and Analysis of Spatial Data Structures*. USA: Addison-Wesley, Reading, MA, ISBN0-201-50255-0.
6. Samet, H. (1995). *Spatial Data Structures in Modern Database Systems: The Object Model, Interoperability, and Beyond*, W. Kim, (Ed.,) USA: Addison-Wesley/ACM Press, 361.
7. <http://www.cs.umd.edu/~hjs/pubs/kim.ps>
8. <http://www.cs.umd.edu/~hjs/pubs/kim2.ps>

GGFP-231 Field visit

No. of Credits: 02

No. of Periods: 30

Course Outcomes:

Study Tours/Field Visits: Study Tours/ Field trips provide opportunities to the learners to test their in-class learning in real life situations as well as to understand the functional diversity in the learning spaces. These may include visits to sites of knowledge creation, preservation, dissemination and application.

GGGET-231 Course: Introduction to Disaster Management

No. of Credits: 02

No. of Periods: 30

Course Outcomes:

1. Describe concepts of Disaster and its relations with Geography.
2. Explain terminology and concepts of Disaster Management.
3. Implement concepts of hazards in different areas and its Management.
4. Explain important local level disasters i.e., cyclone, flood, landslide and flood.
5. To make the students aware of the need of protection & disaster management.
6. Demonstrate Disaster Management at local level.
7. Suggest methods of protection from disaster and will be able to do disaster management.

Modules	Topic	Subtopics	Periods
1	Hazards, Risk, Vulnerability and Disasters: Definition and Concepts.	i. Meaning and definition of Hazards and Disasters ii. Geographical conditions and disasters iii. Classification of Disasters. iv. Disasters in India: (a) Causes, Distribution, Impact, Mapping: Flood, Landslide, Drought Earthquake, Tsunami and Cyclone. v. Human induced disasters: Causes, Impact, Distribution and Mapping.	10
2	Concepts in disaster management	Concepts in disaster management i. Concept of disaster management ii. Aims and objectives. iii. Pre-disaster management and Post – disaster management.	06
3	Response and Mitigation to Disasters	i. Mitigation and Preparedness, NDMA and NIDM; ii. Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During Disasters. iii. Structure of disaster management - Preparedness, Response, Recovery, Mitigation, Rehabilitation. Role of media	08
4	Case Studies of disaster management in India with example of Maharashtra.	Case Studies of Disaster Management i. Cyclone ii. Floods iii. Droughts iv. Landslide	06

Reference Books:

1. Disaster Management Guidelines, GOI-UND Disaster Risk Program (2009-2012).
2. Damon, P. Copola, (2006) Introduction to International Disaster Management, Butterworth Heineman.
3. Gupta A.K., Niar S.S and Chatterjee S. (2013) Disaster management and Risk Reduction, Role of Environmental Knowledge, Narosa Publishing House, Delhi.
4. Murthy D.B.N. (2012) Disaster Management, Deep and Deep Publication PVT. Ltd. New Delhi.
5. Modh S. (2010) Managing Natural Disasters, Mac Millan publishers India LTD.
6. Mrinalini Pandey (2017) Disaster Management, Wiley India Pvt. Ltd.
7. Tushar Bhattacharya (2018) Disaster Science and Management, McGraw Hill Education (India) Pvt. Ltd.

GGMAT -241 Principle of Climatology 4 credits**No. of Credits – 04****No. of Periods – 60.****Course Outcomes**

1. In-depth knowledge of atmospheric moisture and precipitation
2. Knowledge of the cyclones
3. An understanding of air mass, front and classification of climate
4. In-depth knowledge of climatic issues
5. Increasing knowledge of applied climatology

Modules	Topic	Sub-topic	Periods
01	Atmospheric Composition and Structure	i. Vertical structure ii. Variation with Altitude, Latitude and Season; iii. Insolation and Temperature: Factors and Distribution, iv. Heat Budget, v. Temperature Inversion	10
02	Atmospheric Pressure and Winds	i. Atmospheric Pressure, Planetary Winds, Forces affecting Winds, General Circulation of Air, Jet Streams; ii. Atmospheric Moisture: Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation Types, iii. Stability and Instability; iv. Climatic Regions	15
03	Cyclones	i. Tropical Cyclones, ii. Temperate Cyclones, iii. Monsoon - Origin and Mechanism, iv. El Nino and Southern oscillation	10
04	Air Mass, Front and Classification of Climate	i. Concept of Air Mass, Front ii. Classification and types of Air Mass, Front iii. Classification of Climate- Koppen's, classification of world climate.	10
05	Climate Change and Application of Climatology	A. Climate change Concept B. Climatic Issues i. Sea level rise ii. Impact of Climate Change - Carbon foot Print, Global warming- Causes, Heatwave and Coldwave, environmental impacts, and remedies C. Application of Climatology iii. Applied climatology iv. Urban climate	15

Reference

1. Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
2. Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
3. Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi.
4. Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
5. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
6. Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw-Hill.
7. Gupta L S(2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, Delhi Vishwa Vidhyalaya, Delhi.
8. Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhavan, Allahabad.
9. Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad.
10. Singh, S (2009): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad.

GGMAT -242 Fundamentals of Economic Geography

No. of Credits – 02

No. of Periods – 30

Course Outcomes

1. In-depth knowledge of basic economic concepts
2. Knowledge of the locational economic activities
3. An understanding of primary activities
4. In-depth knowledge of secondary activities and SEZ
5. Knowledge of the tertiary activities

Modules	Topics	Sub-topic	Periods
01	Introduction	i. Introduction ii. Concept & Meaning iii. Classification of economic activity	04
02	Location of Economic Activity	Factors affecting location of Economic Activity with special reference to i. Agriculture (Von Thunen Theory) ii. Industry (Weber's Theory). iii. Industrial Regions	08
03	Primary Activities	i. Subsistence ii. Commercial Agriculture iii. Forestry iv. Fishing v. Mining.	06
04	Secondary Activities	i. Manufacturing Industries ii. Concept of Manufacturing Regions iii. Special Economic Zones iv. Technology Parks.	06
05	Tertiary Activities	i. Transport ii. Trade iii. Services.	06

Reference

1. Alexander J. W., 1963: Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
2. Coe N. M., Kelly P. F. and Yeung H. W., 2007: Economic Geography: A Contemporary Introduction, Wiley-Blackwell.
3. Hodder B. W. and Lee Roger, 1974: Economic Geography, Taylor and Francis.
4. Combes P., Mayer T. and Thisse J. F., 2008: Economic Geography: The Integration of Regions and Nations, Princeton University Press.
5. Wheeler J. O., 1998: Economic Geography, Wiley.
6. Durand L., 1961: Economic Geography, Crowell.
7. Bagchi-Sen S. and Smith H. L., 2006: Economic Geography: Past, Present and Future, Taylor and Francis.
8. Willington D. E., 2008: Economic Geography, Husband Press.
9. Clark, Gordon L.; Feldman, M.P. and Gertler, M.S., eds. 2000: The Oxford

GGMAP-243 Surveying Techniques

No. of Credits – 02

No. of Practicals – 15

Course Outcomes

1. Concept of drawing and sheet layout following safety precautions
2. Perform the site survey using Plain-table
3. Perform the site survey using the Dumpy level
4. Perform the site survey using Theodolite
5. Perform the site survey using G.P.S.
6. Perform Auto CAD drawing

Modules	Topic Name	Sub-Topics	Practicals
1.	Basics of Surveying:	Surveying: meaning, classification, Merits and demerits.	1
2.	Instrumental Survey	Plane Table Surveying	2
3.	Dumpy level	Introduction, Concepts, Mechanism, and Pre-requirements of the Dumpy Level	3
4.	Theodolite survey	Introduction, Concepts, Mechanism, and Pre-requirements of the Theodolite Survey	3
5.	CAD	Introduction of Auto CAD	4
6.	GPS survey	Instrument handling and setting	2

References:

1. Kanetker, T.P. and Kulkarni, S.V. (1967): Surveying and Levelling, Vol I and II V.G. Prakashan, Poona.
2. Monkhouse, F.J. and Wilkinson, F.J. (1985): Maps and Diagrams, Methuen, London.
3. Pugh, J.C. (1975): Surveying for Field Scientists, Methuen and Company Ltd., London.
4. Raiz, E. (1962): Principles of Cartography, McGraw Hill, New York.
5. Robinson, Arthur et al., (1978): Elements of Cartography, John Wiley and Sons, New York.
6. Sarkar, A.K. (1997): Practical Geography: A Systematic Approach, Orient Longman, Kolkata.
7. Singh, L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.

GGMIT-242 Disaster Mitigation and Management

No. of Credits: 02

No. of lectures: 30

Course Outcomes:

After the completion of course, the students will have ability to:

1. Understand processes and impact of disaster
2. Understand both the natural and man-made disaster and human negligence in context of environment
3. Write a field work based report on Disaster Management to minimize the disaster risk/
Risk from Disaster.

Modules	Topic	Subtopics	lectures
Modules 1	Hazards, Risk, Vulnerability and Disasters: Definition and Concepts.	i. Meaning and definition of Hazards and Disasters ii. Geographical conditions and disasters iii. Classification of Disasters. iv. Disasters in India: (a) Causes, Distribution, Impact, Mapping: Flood, Landslide, Drought Earthquake, Tsunami and Cyclone. Human induced disasters: Causes, Impact, Distribution and Mapping.	08
Modules 2	Concepts in disaster management	Concepts in disaster management i. Concept of disaster management ii. Aims and objectives.	07
Modules 3	The Project Report based on any two fields based case studies among following disasters and one disaster preparedness plan of respective college/locality and district	1. Flood 2. Drought 3. Cyclone and Hailstorms 4. Earthquake and Volcanoes 5. Landslides 6. Human Induced Disasters: Fire Hazards, Chemical, Industrial accidents	15
Modules 4	Project Report Writing	Project Report Writing	05

References:

1. Carter, N., (1991): Disaster Management: A Disaster Manager's Handbook. Asian Development Bank, Manila.
2. Government of India (2011): Disaster Management in India. Ministry of Home Affairs, New Delhi.
3. Government of India (2008): Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India
4. Kapur, A., (2010): Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
5. Modh, S., (2010): Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.

GGCEP -241 Village Survey

No. of Credits: 02

No. of Periods: 30

Course Outcomes:

Village survey provide opportunities to the learners to test their in-class learning in real life situations as well as to understand the functional diversity in the learning spaces. These may include visits to sites of knowledge creation, preservation, dissemination and application.

GGGEP -241 Practicals in Disaster Management

No. of Credits: 02

No. of Practicals: 15

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. Understand processes and impact of disaster
2. Understand both natural and man-made disaster and human negligence in the context of the environment
3. Write a fieldwork-based report on Disaster Management to minimize the disaster risk/
Risk from Disaster.

Modules	Topic	Subtopics	Practicals
1	The Project Report based on any two fields based case studies among following disasters and one disaster preparedness plan of respective college/locality and district:	1. Flood 2. Drought 3. Cyclone and Hailstorms 4. Earthquake and Volcanoes 5. Landslides 6. Human Induced Disasters: Fire Hazards, Chemical, Industrial accidents	15

References:

1. Carter, N., (1991): Disaster Management: A Disaster Manager's Handbook. Asian Development Bank, Manila.
2. Government of India (2011): Disaster Management in India. Ministry of Home Affairs, New Delhi.
3. Government of India (2008): Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India
4. Kapur, A., (2010): Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
5. Modh, S., (2010): Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.

GGSEP-241 Practicals in Agro-Tourism

No of Credit-2

No of Practicals: 15

Course Outcomes:

1. Define agritourism and food tourism and articulate the latest trends and changing demographics.
2. Discuss interdisciplinary academic approaches, theories, and critical lenses on agritourism.
3. Understand the role of value-added products in both tourism and food security.
4. Link the promotion of sustainability and community resilience to agriculture.

Modules	Topic	Subtopics	Practicals
1	Introduction to Agro-Tourism-	Meaning, Definition, Importance, Scope, Types of Agro-Tourism, Advantages of agro-tourism, Problems of Agro-Tourism Agro tourism: demand and motivation factors	8
2	Planning and Management of Agro tourism	Planning and managing Agrotourism, Need for planning and management, Accommodation and catering in agro-tourism	7
3	Agri-Tourism Products and Services	Classification of Agri-tourism products and services-Agri-accommodation products and services, Agri-food products and services, Agri-recreation products, and services	7
4	Field visit	Field visit and report writing Case Study: Agrotourism: The impact on rural communities Case Study: Trends of Tourism Market for Agro-Tourism	8

References:

1. Michal Sznajder et al. (2009), Agritourism, CAB International
2. Frederic P. Miller, Agnes F. Vandome, McBrewster John (2010). Agritourism, VDM Publishing.
3. Vijay Kumbhar (2013). Problems and Prospects of Agritourism Business, LAP LAMBERT Academic Publishing.

PDEA's.
Prof. Ramkrishna More College, Akurdi, Pune 44
Department of Geography
Board Geography, Faculty of Science and Technology
Graduate and Honour Degree Course Framework under Autonomy as per NEP-2020
2023 Pattern With effect from 2025-26

NEP-2020 Third Year UG Semester-V

MAJOR COURSE

Course Code - GGMAT-351 Geography of India
No. of Credits: 04

Course Type-Theory
No of periods:60

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. Learn the differences in terms of the varied physiography of India.
2. Understand the demographic component and settlement structure in India.
3. Study the economy and various types of resources in India
4. Acquire an understanding and relationship between physiography and drainage, climate, soil
5. Aware of the resources and their conservations.
6. To acquaint the students with the geography of our Nation.

Module	Topic Name	Subtopics	Number of Lectures
Module 1	Physical	Location, Physiographic Divisions, Climate: characteristics and classification; Soil and Natural vegetation.	12
	Population	Distribution and Growth, Structure; Social: Distribution of Population by Race, Caste, Religion, Language, Tribes and their Correlates	12
	Regionalisation of India	Physiographic, Socio-Cultural, Economic	08
Module 2	Economic	Mineral and Power Resources: Distribution and Utilization of Iron Ore, Coal, Petroleum, and Gas; Agricultural Production of Rice, Wheat, Cotton and Sugarcane. Role of Agriculture in Indian Economy; Multinationals and Liberalization; International Trade.	14
	Spatial Patterns of Industrial Development	Special emphasis to Automobile and Information Technology	08
	Contemporary Issues:	Energy crisis, Water Security	06

References:

1. Aher A.B, Chaudhary A. P & Chaodhari Archana. Regional Geography of India Prashant Publication Jalgaon 2015
2. David E. Sopher, Review of Geography of Religions by David E. Sopher Farmer, B.H.: An Introduction to South Asia. Methuen, London, 1983.

3. Deshpande C.D: India-A Regional Interpretation Northern Book Centre, New Delhi.1992.
4. Govt. of India: India - Reference Annual, 2001 Pub. Div, New Delhi, 2001.
5. Govt. of India: National Atlas of India, NATMO Publication, Calcutta.
6. Govt. of India: The Gazetteer of India. Vol I & III Publication Division, New Delhi, 1965.
7. Husain, M., 2014, Geography of India - 5th ed., Tata McGraw-Hill, Delhi.
8. Learmonth, A.T.A. et.al(ed.): Man and Land of South Asia Concept, New Delhi.
9. Mitra, A.: Levels of Regional Development India Census of India, Vol I, Part I-A (i) and (ii) New Delhi, 1967.
10. Negi, Balbir Singh: Geography of India, Kedarnath Ramnath, Meerut, Delhi 1993
11. Patil S. G., Suryawanshi R. S., Pacharne S., Choudhary A. H.: Economic Geography, Atharav Prakashan, Pune. (2014) (Marathi).
12. Routray, J.K.: Geography of Regional Disparity Asian Institute of Technology, Bangkok, 1993.
13. Shafi, M: Geography of South Asia, McMillan & Co., Calcutta, 2000.
14. Singh, R. L.: A Regional Geography, National Geographical Society of India, Varanasi, 1995.
15. Singh, R.L.(ed.): India: A Regional Geography. National Geogphical Society. India, Varanasi, 1971.
16. Spate, O.H.K. and Learmonth, A.T.A.; India and Pakistan - Land, People and Economy Methuen & Co., London, 1967.

Course Code - GGMAT- 352 - SOIL GEOGRAPHY**Course Type-Theory****No of Credit-2****No of periods: 30**

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. Understand the concepts and principles of soil formation.
2. Determine the physical and chemical properties of soils.
3. Enable the students to realize the Soil and environmental problems;
4. Know the significance of soil conservation and methods of Soil reclamation.

Module	Topic Name	Subtopics	Number of Lectures
Module 1	Introduction to Soil Geography	i. Definition ii. Nature and Scope of Soil Geography iii. Development of Geography of Soil iv. Soil as a Natural Resource	05
	Soil Formation and Soil Profile	i. Soil forming processes and factors: Parent Material, Climate, Biota, Time, Topography. ii. Soil Profile: Definition and Structure iii. Physical properties of Soils: Texture, Structure, Colour, Porosity and Permeability, Water holding capacity, Field capacity iv. Chemical properties of Soils: Clays minerals, Cation- Anion exchange, Humus, Organic matter, C:N ratio, pH and NPK; Factors influencing ion exchange and its significance	10
Module 2	Classification and Distribution of Soil and	i. Soil Classification – Genetic, Introduction to Soil taxonomy ii. Land Capability Classification iii. Land Suitability Classification iv. Types of Soil with reference to India	06
	Soil Degradation and Conservation	i. Soil Problems: Soil Pollution, Acidification, salinization and Soil health ii. Soil Conservation: Definition and various methods of Soil Conservation, iii. Soil Conservation in India iv. Role of RS and GIS in Soil Conservation	09

References

1. Birkeland, P. W. (1999): Soils and Geomorphology, Oxford University Press, New York.
2. Brady, N. C., and Weil, R. R. (2008): The Nature and Properties of Soils, Prentice Hall, New Jersey.
3. Bridges, E. M. and Davidson, D. A. (1982): Principles and Applications of Soil Geography, Longman Group, London.
4. Daji, J. A. (1970): A Textbook of Soil Science, Asia Publication House, New York.
5. Gustafson, A.S. (2007): "Soils and Management" Published by Agrobios (India).
6. Kale V. B. (2020): Soil Geography, Himalaya Publishing House, Mumbai.
7. Lal, R. (ed.), (2002): Encyclopaedia of soil science. Marcel Dekker, New York.
8. Miller, C. E. & L.M. Turk, (2001): "Fundamental of soil Science" Biotech Books Delhi.
9. Miller, R. W. and Donahue, R. L. (1992): Soils: An Introduction to Soils and Plant Growth, Prentice-Hall of India, New Delhi.
10. Panda, S. C. (2007): "Soil water conservation and dry farming" Published by Agrobios (India).
11. Pitty, A. F. (1978): Geography and Soil Properties, Methuen and Co., London.

Course Code - GGMAP -353 Practicals in Physical Geography**Course Type-Practical****No of Credit-2****No of periods: 15**

After the completion of the course, the students will have the ability to:

1. Understand the different types of profile analysis.
2. Examine the slope and aspects maps to understand topographical variations.
3. Understand important applied aspects of climatology with the help of climatic diagrams.
4. Construct water budget diagram

Module	Topic	Subtopics	No. of Practical's
Module 1	Geomorphology	Profile Analysis: Longitudinal, Superimposed, Projected and Composite, Intervisibility of Terrains	4
		Slope and Aspect Maps	4
Module 2	Geomorphology	Wind Rose Diagram (Simple and Compound), Climographs, Hythergraphs, Circular Graphs: Climatograph	4
		Water Budget Diagram	3

References:

1. King, C. A. M. (1966): Techniques in Geomorphology, Edward Arnold Ltd., London
2. Lutgens, F. K. and Tarbuck, E. J. (2010): The Atmosphere: An Introduction to Meteorology, Pearson Prentice Hall, New Jersey
3. Miller, A. A. (1953): The Skin of the Earth, Methuen and Co. Ltd., London
4. Monkhouse, F. J. and Wilkinson, H. R. (1964): Maps and Diagrams: Their Compilation and Construction, Methuen and Co. Ltd., London
5. Singh, S. (1998): Geomorphology, Prayag Pustak Bhawan, Allahabad
6. Strahler, A. N. (1964): Quantitative Geomorphology of Drainage Basins and Channel Networks, In: Handbook of Applied Hydrology, Ven Te Chow, Ed., Section 4-II, McGraw-Hill Book Company, New York

Course Code - GGMAP -354 Practicals in Soil Geography**Course Type-Practical****No of Credit-2****No of periods: 15****Course Outcomes:**

After the completion of the course, the students will have the ability to:

- 1) Demonstrate ability in collecting, preparing, and analysing soil samples.
- 2) Apply appropriate methods to assess soil physical and chemical properties and Interpret and evaluate soil analysis data.
- 3) Utilize soil analysis knowledge to recommend sustainable soil management practices.
- 4) Recognize the significance of soil analysis in real-life applications for agriculture, environmental conservation, and land development.

Module	Topic	Subtopics	No. of Practical's
Module 1	Introduction to Soil Sampling Methods	Soil Sampling & Processing of Sample for Testing Basic soil sampling tools Depth of soil sampling Collection of soil samples Preparation of composite soil sample Processing of soil samples for analysis	05
	Soil Analysis	Estimation of Soil primary nutrients (N, P, K), Soil pH Electrical Conductivity of soil Soil Organic Carbon Estimation of BOD Soil Sediment and Grain Size Analysis	06
Module 2	Soil conservation Methods	Crop Rotation, Cover Crops, Contour Plowing, Windbreak, Conservation tillage, Watershed management Introduction to Farmyard manure, animal manures, Rural and urban compost, Vermicomposting	04

References:

1. Carter M.R. and E.G. Gregorich (Editors), "Soil Sampling and Methods of Analysis", CRC Press
2. Daniel Hillel, "Introduction to Environmental Soil Physics", Academic Press
3. Eldor A. Paul, "Soil Microbiology, Ecology, and Biochemistry", Academic Press
4. Helmut Kohnke and Niederholzer, P. J. "Soil Science Simplified", Wiley-Blackwell
5. J. Russell Boulding and G. Fred Lee, "Practical Handbook of Soil, Vadose Zone, and Ground-Water Contamination: Assessment, Prevention, and Remediation", CRC Press
6. Kim H. Tan, "Environmental Soil Science", CRC Press
7. Michael E. Essington, "Soil and Water Chemistry: An Integrative Approach", CRC Press
8. Practical Mannual On Soil Plant and Water Analysis, Ajeet Kumar, Rajat Rajput Abdul Rahman M. Satyarath Sonkar, BFC PUBLICATIONS PVT LTD
9. Protocols for Soil Sampling, Soil and Water Analysis, Shrvan Kumar, M.V.S. Rajeshwar Rao and Anil R. Chinchmalatpure, ICAR-CSSRI/Bharuch/Technical Manual/2017/07
10. Schaetzl J. R. and Robert O. Siltanen, "Soil Geography and Land Use Planning", CRC Press
11. Soil Analysis: An Interpretation Manual, Edited by KI Peverill, LA Sparrow, DJ Reuter

MAJOR ELECTIVE COURSES

Course Code - GGMET -351 Digital Cartography
No. of Credits: 02

Course Type-Theory
No. of Theory: 30

Course Outcome:

After the completion of the course, the students will have the ability to:

1. To impart adequate professional knowledge and computer skills to enable the students to take up a career in the field of Geospatial Technology.
2. To introduce to the students a new Geospatial Technology of Digital Cartography.
3. To gain an understanding of cartographic software to produce accurate appropriate convincing and creative cartographic and graphic images.
4. To gain the knowledge about basic knowledge and computer skills in digital cartography.
5. Possess knowledge about new geospatial technology of digital cartography.
6. Be acquainted with the skill of data management and graphical representation digitally.

Module	Topic	Subtopics	No. of Lectures
Module-1	Introduction to Cartography	Introduction to Cartography, Elements of Cartography Basics of Digital Cartography	3
	Application of Digital Cartography	Representation of geospatial data: histogram, bar graphs, line graphs, scatter diagram, pie diagram and trend line in MS Excel; Preparation of located diagrams & thematic maps in QGIS	4
Module-2	Application of computer-assisted cartography	Application of computer-assisted cartography in various fields e.g. earth sciences, environmental sciences, natural resources, regional development and planning, management, agriculture, forestry, disaster management, water resources, urban planning etc.	4
	Data Collection	Data Collection, Application of Digital cartography and Report Writing	4

Reference Books:

1. Cromley, R.G. (1992): Digital Cartography, Prentice-Hall, New York.
2. Dent, B.D. (1999): Cartography- Thematic Map Design, 5th Edition, WCB McGraw Hill, Boston.
3. Kraak M. J. and Ormeling, F. (2004): Cartography: Visualization of Spatial Data, Pearson Edu. Pvt Ltd. (Singapore) Inelian Branch, New Delhi.
4. Mishra, R.P. (1973): Fundamentals of Cartography, Prasaranga, University of Mysore.
5. Monkhouse, F.J.R. & Wilkinson H.R. (2000): Maps and Diagrams, Methuen & Co. London.
6. Monmonier, M.S. (1982): Computer Assisted Cartography: Principles and Prospects, Prentice Hall.
7. Raisz, Erwin (1962): Principles of Cartography, McGraw-Hill, New York.
8. Rampal, K.K. (1993): Mapping and Compilation, Concept Publishing Co. New Delhi.
9. Robinson, H. et al (1995): Elements of Cartography, 6th Edition, John Wiley & Sons, New York.
10. Sarkar, A (2009): Practical Geography: A Systematic Approach, Orient Longman, Kolkatta.
11. Slocum, T.A. et al. (2008): Thematic Cartography and Geovisualization, 3rd Edition, Prentice Hall.

Course Outcome:

After the completion of the course, the students will have the ability to:

1. To introduce to the students a new Geospatial Technology of Digital Cartography and obtain knowledge about importance and applications of digital cartography.
2. To impart adequate professional knowledge of open source GIS software for data acquisition and management.
3. Apply the skill about Georeferencing, and map layout tool.
4. Prepare digital map.

Module	Topic	Subtopics	No. of Practical's
Module-1	Digital Cartography and GIS	i. Overview of digital cartography ii. Data types iii. Data acquisition and management using GIS software's	3
	Coordinate systems and Georeferencing	i. Raster and vector data ii. Coordinate Systems iii. Georeferencing of SOI Toposheet or satellite image iv. Mosaic and image subset	4
Module-2	Cartographic Design	i. Digitization of three features i.e. Point, line and polygon ii. Data editing and attribute attachment iii. Symbolization iv. Color selection in map layout.	4
	Map Layout	i. Labelling ii. Elements of Maps iii. Effective map layout and composition iv. Creation of maps using GIS software's	4

Reference Books:

1. Cromley, R.G. (1992): Digital Cartography, Prentice-Hall, New York.
2. Dent, B.D. (1999): Cartography- Thematic Map Design, 5th Edition, WCB McGraw Hill, Boston.
3. Kraak M. J. and Ormeling. F (2004): Cartography: Visualization of Spatial Data, Pearson Edu. Pvt Ltd. (Singapore) Inelian Branch, New Delhi.
4. Mishra, R.P. (1973): Fundamentals of Cartography, Prasaraanga, University of Mysore.
5. Monkhouse, F.J.R. & Wilkinson H.R. (2000): Maps and Diagrams, Methuen & Co. London.
6. Monmonier, M.S. (1982): Computer Assisted Cartography: Principles and Prospects, Prentice Hall.
7. Raisz, Erwin (1962): Principles of Cartography, McGraw-Hill, New York.
8. Rampal, K.K. (1993): Mapping and Compilation, Concept Publishing Co. New Delhi.
9. Robinson, H. et al (1995): Elements of Cartography, 6th Edition, John Wiley & Sons, New York.
10. Sarkar, A (2009): Practical Geography: A Systematic Approach, Orient Longman, Kolkatta.
11. Slocum, T.A. et al. (2008): Thematic Cartography and Geovisualization, 3rd Edition, Prentice Hall.

MINOR COURSES

Course Code - GGMIP-351 Practical in Rural Development

No. of Credits: 04

Course Type-Theory

No. of Lectures: 30

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. To make the students aware of the significance & importance of Rural development in the world.
2. Basic understanding of concepts of Rural Development
3. To introduce the students to various vulnerabilities & various adaptation possibilities.
4. To inform about the necessity of incorporating and considering the changing Rural in various long-term planning and development activities.

Module	Topic	Sub Topic	No. of Practicals
Module 1	Rural Development Thoughts & Theories	i. Concepts of Rural development, Rural development policies, Approaches. ii. Indian School of Geographical Thoughts iii. Development Theories	05
Module 2	Planning & Management	i. Introduction ii. Rural development Planning, concept & importance iii. Rural development management iv. Infrastructure Management	05
	Approaches to Rural Development in India	i. Decentralized Planning Approach ii. Sectoral Approach Participatory Approach	05
Module 3	Issues of Rural Development	i. Lack of safe drinking water ii. Rural Sanitation Problems and Programs iii. Green revolution and its benefits to Urban and Rural Sectors iv. Green revolution and its benefits to Urban and Rural Sectors Urban-Rural Divide	05
Module 4	Rural Health	i. Health Care Services in Rural Areas ii. Maternal and Child Health iii. National Health Policy of India National Rural Health Mission	05
	Fieldwork	Fieldwork (Village Survey, report writing and presentation) 12-15 days.	05

References

1. Alam m Gopi, k.n (1982) Settlement system of India Oxford & IBH Publication, New Delhi
2. Banerjee, Abhijit V & DUFLO Esther, 2011, Poor Economic – rethinking poverty & the ways to end it, Random Houses India
3. Chamber, Robert, 2005, Ideas for Development, Earthscan from Routledge Dantwala,
4. Economic Geography. Sadha –Khan 8. Ruural Energy criai S. Giriappa Himalaya
5. Gilg A. W., 1985: An Introduction to Rural Geography, Edwin Arnold, London.
6. Human Resource Development T.Y. Rao SAGE Publication New Delhi.
7. Indian economy R. D. Sudharam Chand and co. Ramnagar New Delhi.
8. Intermation Technology and Globalization S.K. Bansal APII Publishing Corp. Ansari Rd. Delhi.

9. K Vijayakumar Empowerment of weaker section future planning and strategies for Rural Development in India.
10. Katar Singh -Rural Development –Principles, Policies and Management.
11. Krishnamurthy, J. (2000). Rural Development - Problems and Prospects. Jaipur, India: Rawat Publs.
12. M. L., Gupta, Ranjit & D'Souza, Keith C. I., 1998, Oxford & IBH Publishing Company Pvt. Ltd
13. Mandal R.B (2001) Introduction to Rural Settlement Concepts Publishing Company, New Delhi
14. Mishra,S.K. and Puri V.K. - 2012.Economics of Development and Planning, Himalaya Publishing House, Mumbai,
15. Mukherjee, Neela. (1993). Participatory Rural Appraisal: Methodology and Application. Delhi, India: Concept Publs. Co.
16. Mukundan, N.-Rural Development and Poverty eradication in India.
17. Palione, M. (1984). Rural Geography. London, UK: Harper and Row.
18. Ramachandran, H., and Guimaraes, J.P.C. (1991). Integrated Rural Development in Asia–Learning from Recent Experience. New Delhi, India: Concept Publishing.
19. Rural Development Satya Sundaram, Himalaya publication House Mumbai
20. Shankar Chatterjee- Implementation of Rural Development.
21. Singh, R.B. (1985) Geography of Rural Development. New Delhi, India: Inter India.
22. Vasant Desai, (2012) Rural Development in India, Himalaya Publishing House, Mumbai,

GGMET -351A Application of Remote Sensing

Course Type-Practical

No. of Credits: 02

No. of Practicals: 15

Course Outcomes:

By the end of the course, students will be able to:

1. Understand and apply the fundamental principles of remote sensing
2. Identify various types of remote sensing data
3. Process and analyze remote sensing data
4. Apply remote sensing techniques to address specific geographic problems in fields like land-use change, environmental monitoring, and disaster management.
5. Interpret and communicate remote sensing findings.
6. Work with geospatial data.

Modules	Units	Subunits	Lectures
Module 1	Introduction to Remote Sensing	i. Remote sensing: Meaning, process, development and advancements in remote sensing technologies. ii. Basic principles: Energy sources, sensors, and detectors. iii. Overview of platforms: Satellites, UAVs, Aircraft.	4
	Electromagnetic Spectrum and Remote Sensing	i. The electromagnetic spectrum (EMS) and its relevance to remote sensing. ii. Interaction of electromagnetic radiation with different Earth surfaces. iii. Spectral bands and their applications (e.g., infrared, microwave). iv. Spectral signatures of land features (vegetation, water, soil, etc.).	6
Modules 2	Remote Sensing Platforms and Sensors	i. Types of remote sensing systems: Active vs. Passive ii. Characteristics of sensors: Multispectral, hyperspectral, radar, LiDAR. iii. How platforms and sensors influence spatial, spectral, and temporal resolution. iv. Overview of satellite systems: Landsat, SPOT, Sentinel, and others. v. Global navigation systems and positioning for remote sensing.	6
	Image Processing and Enhancement Techniques	i. Overview of remote sensing data types: Raster vs. vector data. ii. Image pre-processing techniques: Geometric correction, radiometric correction. iii. Image enhancement: Contrast stretching, edge detection, filtering. iv. Introduction to software tools for image processing (QGIS, ERDAS IMAGINE, ENVI).	6
	Remote Sensing Applications in Geography	i. Land use/land cover (LULC) mapping and change detection. ii. Environmental monitoring: Deforestation, urbanization, water resources, vegetation health. iii. Urban studies: Mapping urban sprawl and infrastructure development. iv. Disaster management: Flood monitoring, damage assessment, and mitigation. v. Climate change monitoring: Temperature trends, sea-level rise, drought, and precipitation patterns. vi. Vegetation indices: Normalized Difference Vegetation Index (NDVI), Leaf Area Index (LAI). vii. Soil moisture estimation using remote sensing. viii. Monitoring coastal zones, wetlands, and other sensitive ecosystems	8

References:

1. Jensen, J. R. (2015). *Remote Sensing of the Environment: An Earth Resource Perspective* (2nd ed.). Pearson.
2. Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). *Remote Sensing and Image Interpretation* (7th ed.). Wiley.
3. Sabins, F. F. (1996). *Remote Sensing: Principles and Interpretation* (3rd ed.). W.H. Freeman.
4. Chang, K. T. (2016). *Introduction to Geographic Information Systems* (7th ed.). McGraw-Hill.
5. Singh, A., & Misra, R. (2018). *Fundamentals of Remote Sensing*. Prentice Hall.

GGMEP-352A Application of Remote Sensing

Course Type-Practical

No. of Credits: 02

No. of Practicals: 15

Course Outcomes:

By the end of the course, students will be able to:

1. Understand and apply the fundamental principles of remote sensing
2. Identify various types of remote sensing data
3. Process and analyze remote sensing data
4. Apply remote sensing techniques to address specific geographic problems in fields like land-use change, environmental monitoring, and disaster management.
5. Interpret and communicate remote sensing findings.
6. Work with geospatial data.

Modules	Units	Subunits	Practicals
Module 1	Introduction to Satellite products and Image processing Software	i. Overview of remote sensing software (e.g., QGIS, ArcGIS, ERDAS IMAGINE). ii. Introduction to remote sensing data formats (GeoTIFF, HDF, NetCDF). iii. Downloading and visualizing remote sensing datasets.	3
	Basic operations	i. Image stacking ii. Band combination iii. True colour Composites and false colour composites iv. Band ratio v. Indices - NDVI NDWI	4
Module 2	Land Use and Land Cover Mapping	i. Classifying land use/land cover types from satellite imagery (forest, water, urban, agriculture). ii. Mapping and analyzing changes in land cover over time. iii. Creating land cover maps	5
	Project	i. Select a geographical or environmental issue and analyze it using remote sensing. ii. Conduct data analysis using tools and techniques learned throughout the course. iii. Present the results in a final report, including maps, charts, and written interpretation.	3

References:

1. Jensen, J. R. (2015). *Remote Sensing of the Environment: An Earth Resource Perspective* (2nd ed.). Pearson.
2. Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). *Remote Sensing and Image Interpretation* (7th ed.). Wiley.
3. Sabins, F. F. (1996). *Remote Sensing: Principles and Interpretation* (3rd ed.). W.H. Freeman.
4. Chang, K. T. (2016). *Introduction to Geographic Information Systems* (7th ed.). McGraw-Hill.
5. Singh, A., & Misra, R. (2018). *Fundamentals of Remote Sensing*. Prentice Hall.

VSC

Course Code - GGVSP-351 Geographical Information Systems

Course Type-Practical

No. of Credits: 02

No. of Practicals: 15

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. To make the students aware of the significance & importance of function of GIS.
2. Basic understanding data structures in GIS for analysis various facts.
3. Compare Raster data, Vector data in GIS to recognize its role in generating information about different features on the earth
4. Develop spatial thinking in GIS by using geo-processes and functions, collect GIS data to study recent advances.

Module	Topic	Sub Topic	No. of Practicals
Module 1	Function of GIS	i. Introduction iii. Function of GIS ii. Georeferencing & Datum	03
	Data Structures in GIS	i. Spatial data: Raster data, Vector data, comparative overview ii. Non-spatial data - Hierarchical, Network and relational data. iii. Concept and type of topology	04
Module 2	Spatial Analysis	i. Vector based: Overlays operations- point in polygon, line in polygon, polygon in polygon ii. Single layer operations and Multilayer operations. iii. Raster based: Map algebra, Grid-based operations iv. Buffering, Network Analysis, Terrain Analysis, Digital Terrain models and generation of Thematic maps.	04
	Applications of GIS	i. Land Use Land Cover (LULC) changes ii. Natural hazards & hazard management iii. Monitoring water quality and soil quality iv. Use of GIS to highlight Environmental issues	04

References

1. Alan S. Belward and Carlos R. Valenzuela (1991) Remote Sensing and Geographical Information Systems for Resource Management in Developing Countries
2. Anji Reddy, M. (2008): Textbook of Remote Sensing and Geographic Information System, B.S. Publication, Hyderabad.
3. Bhatta (2008) Remote Sensing and GIS, Oxford University press.
4. Burrough, P. A. and McDonnell, R. A. (2000): Principles of Geographical Information Systems, Oxford University Press, New York
5. Burroughs, P. A (1986): Principles of Geographical Information Systems for land Resource Assessment, Oxford University Press.
6. Chang, K. T. (2008): Introduction to Geographic Information Systems, Avenue of the Americas, McGraw-Hill, New York
7. Demers, M. N. (2000): Fundamentals of Geographic Information Systems, John Wiley and Sons, New Delhi
8. Haywood, Ian (2000): Geographical Information Systems, Longman
9. Korte, G. B. (2001): The GIS Book, Onward Press, Bangalore
10. Lo, C. P., Yeung, A. W. (2002): Concepts Techniques of Geographical Information Systems, Prentice-Hall of India, New Delhi
11. Longley, P. A., Goodchild, M. F., Maguire, D. J., Rhind, D. W. (2002): Geographical Information Systems and Science, John Wiley & Sons, Chichester
12. M. Anji Reddy (2008) Textbook of Remote Sensing and Geographical Information Systems Third Edition

Research Project -351

Research project for 2 credits in Major Discipline Specific Subject

Course Objectives:

- 1. To familiarize students with the basics and principles of field research and data collection methods.**
- 2. To learn diverse research methodologies proficiently.**
- 3. To analyze and synthesize scholarly literature effectively.**
- 4. To develop skills in data analysis using cartographic and / or computer-based tools.**
- 5. To enhance report writing capabilities, following academic standards and formats.**
- 6. To prepare students for more extensive scientific research projects and execute them independently.**

Course Outcomes:

By the end of the course, the student will:

- 1. be able to identify and articulate a research topic that is relevant to their field of study.**
- 2. be able to achieve their research objective through different methodological approaches**
- 3. be familiar with the utilization of cartographic and computer tools to organize and/or present data.**
- 4. be able to evaluate research findings and methodologies critically.**
- 5. be skilled in organizing their research findings in a structured and comprehensive report that meet academic standards.**
- 6. develop necessary skills to conduct research effectively and contribute meaningfully to their field of study.**

NEP-2020 Third Year UG Semester-VI

MAJOR COURSE

Course Code - GGMAT -361 Geography of Maharashtra

No. of Credits: 04

Course Type-Theory

No of periods:60

Course Outcome:

After the completion of the course, the students will have the ability to:

1. Study the different elements of Maharashtra's physical geography, such as location, geological structure, climate, and geomorphological structure.
2. To describe the administrative divisions in detail.
3. To observe drainage systems, climatic regions, drought-prone regions, etc.
4. To familiarise the students with basic knowledge of our state.
5. To make the students of available natural resources and the need for conservation and protection.
6. To know the demographic structure of Maharashtra.

Module	Topic Name	Subtopics	No. of Lectures
Module 1	Administrative Division and Physiography of Maharashtra	Physical and administrative Divisions of Maharashtra, Geological Structure of Maharashtra.	12
	River System of Maharashtra	Major River Basins-Godavari, Bhima, Krishna, Tapi, Narmada and Konkan Rivers.	12
	Climate	Climatic classification According to Trewartha, Distribution of Rainfall, Drought Prone Area.	12
Module 2	Resources	Forest- Types and Conservation, Agriculture- Importance of Agriculture in Economy of Maharashtra, Major Crops, Cash Crops and Horticulture Minerals -Manganese, Iron ore, Bauxite, Chromite, Limestone, Dolomite and Industrial development. Power- Hydro, Thermal, Atomic	12
	Population	Population distribution of Maharashtra, Density, Sex ratio, Literacy, Distribution of Rural and urban population, Urbanization, Migration.	12

References

1. Dastane S., Maharashtra, Ramchandra and Company, Pune
2. Deshpande C. D., Maharashtra
3. Dikshit K.R., Maharashtra in Maps,
4. Jaymala Diddee, S.R. Jog, V.S. Kale, V.S. Datye Geography of Maharashtra, Rawat Publications 2002
5. Karve I., Maharashtra its Land and people
6. Maharashtra State Agricultural Atlas
7. Sadhu Arun, Maharashtra, National Book Trust
8. Savadi A. B., Geography of Maharashtra: Nirali Prakashan, Pune
9. Sawadi A. B., The Mega State Series: Nirali Publication, Pune.

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. To understand the concepts of watershed management and its effect on land, water, and ecosystem resources
2. To evaluate the impact of watershed characteristics on water quality and aquatic ecosystems.
3. Be able to conduct a comprehensive appraisal of watershed and human resources, considering physical, hydrological, and land use factors.
4. Be acquainted with the soil and water conservation measures to protect and enhance watershed health and resilience.

Module	Topic Name	Subtopics	No. of Lectures
Module 1	Watershed	i. Watershed: concept and significance of watershed-based development. ii. Watershed characteristics: geomorphology and hydrology; drainage basin, network and channel morphology	05
	Watershed hydrology	i. Watershed hydrology: hydrologic cycle, water balance, climate and precipitation, soils and infiltration, interception and evapotranspiration, groundwater, streamflow and runoff, water quality, aquatic ecosystems (eutrophication, habitat disturbance, etc.)	05
	Watershed resource appraisal	i. Watershed resource appraisal: physical, hydrological, land use/cover Land capability classification	05
Module 2	Watershed management and planning	i. Watershed management and planning: objectives, integrated watershed management, sustainable watershed management Human aspects of watershed management: Participatory resource appraisal	07
	Issues in water resources and Soil and water conservation measures	i. Issues in water resources: point source pollution, agricultural and urban non-point source pollution, erosion, water scarcity, flooding, drinking water protection, wastewater treatment and septic systems ii. Soil and water conservation measures	08

References:

1. Brooks, K. N., Folliott, P. F. & Magner, J. A. (2012): Watershed management issues. Hydrology and the Management of Watersheds, Wiley-Blackwell, Oxford
2. Cech, T. V. (2018). Principles of Water Resources: History, Development, Management, and Policy. John Wiley and Sons, New York
3. Heathcote, I. W. (2009). Integrated Watershed Management: Principles and Practice. John Wiley and Sons, New York.
4. Murty, J. V. S. (2013). Watershed management. New Age International Publishers.
5. Mutreja, K. N. (1986). Applied Hydrology. Tata McGraw-Hill Pub. Co. Ltd., New Delhi.

Course Code - GGMAP -463 Practicals in Human Geography 2 credits**Course Type-Practical****No. of Credits: 02****No of practicals :15****Course Outcomes:**

After the completion of the course, the students will have the ability to:

1. Understand the various concepts and methods of Human Geography.
2. Apply practical knowledge for the analysis of project work as well as research.
3. Apply models to different geographical situations

Module	Topic	Sub Topic	Practicals
Module 1	Population and Settlement Geography	Methods of Representing Population and Settlement Data	07
		Application of Models Using Data: Dependency Ratio, Spatial Interaction Models: Potential Model, Gravity Model Methods of Field Study: Preparation of Questionnaire /Interview Schedules and Report Writing	08
Module 2	Economic Geography	Methods of Representing and Mapping of Economic Data	08
		Measures of Transport Network Location Quotient	07

References:

1. Chorley, R. J., & Hagget, P. (1972). Socio-economic Models in Geography. London: Mathuen and Co.
2. Liendsor, J. M. (1997). Techniques in Human Geography. London: Routledge.
3. Lloyd P., & Dicken, B. (1972). Location in Space: A Theoretical Approach to Economic Geography. New York: Harper and Row.
4. Monkhouse, F. J., & Wilkinson, H. R. (1971). Maps and Diagrams. London: Methuen and Co.
5. Wood, A., & Roberts, S. (2011). Economic Geography: Places, Network and Flows. London: Routledge.

No of practicals :15

1. It includes the methods of data presentation in a graphical manner and also introduces the measures of central tendency.
2. It deals with the measures of deviation and variation. It also reveals the measures of diversion from normality.
3. It discusses the basic concept of normal distribution and statistical significance testing.
4. It elaborates the measures of distribution and also deals with methods of concentration.
5. It has been dedicated to the statistical methods of hypothesis testing.

1. David M. Smith (1975), *Patterns in Human Geography*, Penguin, Harmons worth.
2. David U (1981), *Introductory Spatial Analysis*, Methuen, London.
3. Ebdon, D. (1983), *Statistics in Geography: A Practical Approach*, Blackwell, London.
4. Gregory, S. (1978), *Statistical Methods and the Geographer* (4th Edition), Longman,
5. Gregory, S. (1978), *Statistical Methods and the Geographer*, Longman, London.
6. Gupta, S.P. (2010), *Statistical Methods*, Sultan Chand and Sons, Latest Edition.
7. Karlekar S. N. and Kale M. (2005): *Statistical Analysis of Geographical Data*, Diamond Publication, Pune.

MAJOR ELECTIVE COURSES

Course Code - GGMET-461 Advances in GIS

No. of Credits: 02

Course Type-Theory

No of periods:30

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. Students are able to store data in computer & generating the information products.
2. Basic understanding concepts of Digital Terrain Modelling
3. Students are understanding various spatial analysis techniques.
4. Students are able to implementation of GIS tool & making project management.

Module	Topic	Sub Topic	Lectures
Module 1	Visualization & Generation Information Product	1. Introduction 2. Cartography in the context of GIS 3. Human-computer interaction & GIS 4. Visualization of Geographic Information 5. Generation of Information Products	04
	Digital Terrain Modelling	1. Definition & Terminology 2. Acquisition of Digital Terrain Data 3. Data Processing, Analysis, & Visualization 4. Application of Digital Terrain Models	09
Module 2	Spatial Analysis	1. Spatial Autocorrelation 2. Nearest Neighbour Analysis 3. Trend Surface Analysis 4. Network Analysis	09
	GIS Implementation & Project Management	1. GIS Project Planning 2. System Analysis & User Requirement Studies 3. Geographic Database Design Methodology 4. GIS Application Software Design Methodology 5. System Maintenance & Technical Support	08

References

1. Alan S. Belward and Carlos R. Valenzuela (1991) Remote Sensing and Geographical Information Systems for Resource Management in Developing Countries
2. Bhatta (2008) Remote Sensing and GIS, Oxford University press.
3. Burrough, P. A. and McDonnell, R. A. (2000): Principles of Geographical Information Systems, Oxford University Press, New York
4. Burroughs, P. A (1986): Principles of Geographical Information Systems for land Resource Assessment, Oxford University Press.
5. Chang, K. T. (2008): Introduction to Geographic Information Systems, Avenue of the Americas, McGraw-Hill, New York
6. Demers, M. N. (2000): Fundamentals of Geographic Information Systems, John Wiley and Sons, New Delhi
7. Haywood, Ian (2000): Geographical Information Systems, Longman
8. Korte, G. B. (2001): The GIS Book, Onward Press, Bangalore
9. Lo, C. P., Yeung, A. W. (2002): Concepts Techniques of Geographical Information Systems, Prentice-Hall of India, New Delhi
10. Longley, P. A., Goodchild, M. F., Maguire, D. J., Rhind, D. W. (2002): Geographical Information Systems and Science, John Wiley & Sons, Chichester

11. M. Anji Reddy (2008) Textbook of Remote Sensing and Geographical Information Systems Third Edition
12. M. Anji Reddy, M. (2008): Textbook of Remote Sensing and Geographic Information System, B.S. Publication, Hyderabad.

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. Students are able to store data in computer & generating the information products.
2. Basic understanding concepts of Digital Terrain Modelling
3. Students are understanding various spatial analysis techniques.
4. Students are able to implementation of GIS tool & making project management.

Module	Topic	Sub Topic	Practicals
Module 1	Visualization & Generation Information Product	1. Introduction 2. Cartography in the context of GIS 3. Human-computer interaction & GIS 4. Visualization of Geographic Information 5. Generation of Information Products	02
	Digital Terrain Modelling	1. Definition & Terminology 2. Acquisition of Digital Terrain Data 3. Data Processing, Analysis, & Visualization 4. Application of Digital Terrain Models	04
Module 2	Spatial Analysis	1. Spatial Autocorrelation 2. Nearest Neighbour Analysis 3. Trend Surface Analysis 4. Network Analysis	04
	GIS Implementation & Project Management	1. GIS Project Planning 2. System Analysis & User Requirement Studies 3. Geographic Database Design Methodology 4. GIS Application Software Design Methodology 5. System Maintenance & Technical Support	05

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1. Alan S. Belward and Carlos R. Valenzuela (1991) Remote Sensing and Geographical Information Systems for Resource Management in Developing Countries
2. Anji Reddy, M. (2008): Textbook of Remote Sensing and Geographic Information System, B.S. Publication, Hyderabad.
3. Bhatta (2008) Remote Sensing and GIS, Oxford University press.
4. Burrough, P. A. and McDonnell, R. A. (2000): Principles of Geographical Information Systems, Oxford University Press, New York
5. Burroughs, P. A (1986): Principles of Geographical Information Systems for land Resource Assessment, Oxford University Press.
6. Chang, K. T. (2008): Introduction to Geographic Information Systems, Avenue of the Americas, McGraw-Hill, New York
7. Demers, M. N. (2000): Fundamentals of Geographic Information Systems, John Wiley and Sons, New Delhi
8. Haywood, Ian (2000): Geographical Information Systems, Longman
9. Korte, G. B. (2001): The GIS Book, Onward Press, Bangalore
10. Lo, C. P., Yeung, A. W. (2002): Concepts Techniques of Geographical Information Systems, Prentice-Hall of India, New Delhi
11. Longley, P. A., Goodchild, M. F., Maguire, D. J., Rhind, D. W. (2002): Geographical Information Systems and Science, John Wiley & Sons, Chichester
12. M. Anji Reddy (2008) Textbook of Remote Sensing and Geographical Information Systems Third Edition

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. To make the students aware of the significance & importance of climate change in the world.
2. Basic understanding of concepts of climate change
3. To introduce the students to various vulnerabilities to climate change and various adaptation possibilities.
4. To inform about the necessity of incorporating and considering the changing climate in various long-term planning and development activities.

Module	Topic	Sub Topic	Lectures
Module 1	Introduction to Climate Change, Vulnerability & Adaptation	1. Introduction 2. Concepts of Climate Change 3. Concepts of vulnerability 4. Concept of adaptation	03
	Climate Change	1. Introduction 2. Reconstruction of Past Climate 3. Climate Change through Geological Time 4. Theories of Climate Change	09
Module 2	Vulnerability	1. Introduction 2. Vulnerability – meaning and concepts 3. Evolution of vulnerability assessment 4. Vulnerability – a component of risk assessment 5. Methods of vulnerability assessment	09
	Adaptation	1. Adaptation vs. resilience 2. Climate-resilient development 3. Indigenous knowledge for adaptation to Climate change. 4. Indicators of adaptation 5. Problems of its operationalization 6. Adaptation strategies	09

References

1. Adenle A., Azadi H., Arbiol J., 2015. Global assessment of technological innovation for climate change adaptation and mitigation in developing world, Journal of Environmental Management, 161 (15): 261-275.
2. Adger W. N., 2006. Vulnerability, Global Environmental Change 16 (2006) 268–281.
3. Barnett, J. & S. O'Neill (2010). Maladaptation. Global Environmental Change—Human and Policy Dimensions 20: 211–213.
4. Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.
5. Barry R. G. and Corley R. J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
6. Berrang-Ford, L., J.D. Ford & J. Paterson (2011). Are we adapting to climate change? Global Environmental Change—Human and Policy Dimensions 21: 25-33.
7. Critchfield H. J., 1987: General Climatology, Prentice-Hall of India, New Delhi.
8. Gupta L S (2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, Delhi Vishwa Vidhyalaya, Delhi.
9. Kelkar U., Kapil Kumar Narula, Ved Prakash Sharma, Usha Chandna (2008) Vulnerability and adaptation to climate variability and water stress in Uttarakhand State, India, Global Environmental Change 18: 564–574
10. Khajuria A. and Ravindranath N.H. 2012, Climate Change Vulnerability Assessment: Approaches DPSIR Framework and Vulnerability Index, J Earth Science and Climate Change, 3:1.
11. Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhavan, Allahabad.

12. Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
13. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
14. Orlove B., 2005. Human Adaptation to Climate Change: A Review of Three Historical Cases and Some General Perspectives, Environmental Science & Policy, 8(6): 589-600.
15. Singh, S (2009): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad.
16. Sovacool B.K., D'Agostino A.L., Meenawat H., Rawlani A., 2012. Expert views of climate change adaptation in least developed Asia. Journal of Environmental Management, 97 (30): 78-88.
17. Tanner, T.M. and Horn-Phathanothai, D.L., 2014. Climate Change and Development, Routledge Perspectives on Development.
18. Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw-Hill.
19. Varma et al 2014_ Climate change disasters and development: Testing the waters for adaptive governance in India. Vison 18 (4) 327-338.
20. Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad.

Course Code - GGMEP-462 A Climate Change, Vulnerability and Adaptation**Course Type-Practical****No. of Credits: 02****No of periods:15****Course Outcomes:**

After the completion of the course, the students will have the ability to:

1. To make the students aware of the significance & importance of climate change in the world.
2. Basic understanding of concepts of climate change
3. To introduce the students to various vulnerabilities to climate change and various adaptation possibilities.
4. To inform about the necessity of incorporating and considering the changing climate in various long-term planning and development activities.

Module	Topic	Sub Topic	Lectures
Module 1	Introduction	1. Introduction, Concepts of Weather & Climate Change, Concepts of vulnerability, Concept of adaptation	02
	Weather Sign & Symbols & Instruments	Introduction, Weather Sign & Symbols, Weather Instruments, Weather Instruments Applications	04
Module 2	Climatic Diagrams	Introduction, Wind Rose, Climatograph, Climograph, Hythergraph	03
	Study of Climatic Hazards	1. Study of Climatic Hazards 2. Cyclones 3. Drought 4. Tsunami	03
	Field Visit	Visit to Exploration	03

References

1. Adenle A., Azadi H., Arbiol J., 2015. Global assessment of technological innovation for climate change adaptation and mitigation in developing world, Journal of Environmental Management, 161 (15): 261-275.
2. Adger W. N., 2006. Vulnerability, Global Environmental Change 16 (2006) 268–281.
3. Barnett, J. & S. O'Neill (2010). Maladaptation. Global Environmental Change—Human and Policy Dimensions 20: 211–213.
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8. Gupta L S (2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, Delhi Vishwa Vidhyalaya, Delhi.
9. Kelkar U., Kapil Kumar Narula, Ved Prakash Sharma, Usha Chandna (2008) Vulnerability and adaptation to climate variability and water stress in Uttarakhand State, India, Global Environmental Change 18: 564–574

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13. Oliver J. E. and Hidore J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, New Delhi.
14. Orlove B., 2005. Human Adaptation to Climate Change: A Review of Three Historical Cases and Some General Perspectives, Environmental Science & Policy, 8(6): 589-600.
15. Singh, S (2009): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad.
16. Sovacool B.K., D'Agostino A.L., Meenawat H., Rawlani A., 2012. Expert views of climate change adaptation in least developed Asia. Journal of Environmental Management, 97 (30): 78-88.
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18. Trewartha G. T. and Horne L. H., 1980: An Introduction to Climate, McGraw-Hill.
19. Varma et al 2014_Climate change disasters and development: Testing the waters for adaptive governance in India. Vision 18 (4) 327-338.
20. Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad.

MINOR COURSES

Course Code – GGMIT -461 Climate Change, Vulnerability and Adaptation

Course Type-Theory

No. of Credits:02

No of periods:30

Course Outcomes:

After the completion of the course, the students will have the ability to:

1. To make the students aware of the significance & importance of climate change in the world.
2. Basic understanding of concepts of climate change
3. To introduce the students to various vulnerabilities to climate change and various adaptation possibilities.
4. To inform about the necessity of incorporating and considering the changing climate in various long-term planning and development activities.

Module	Topic	Sub Topic	Lectures
Module 1	Introduction to Climate Change, Vulnerability & Adaptation	1. Introduction 2. Concepts of Climate Change 3. Concepts of vulnerability 4. Concept of adaptation	03
	Climate Change	1. Introduction 2. Reconstruction of Past Climate 3. Climate Change through Geological Time 4. Theories of Climate Change	09
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	Adaptation	1. Adaptation vs. resilience 2. Climate-resilient development 3. Indigenous knowledge for adaptation to Climate change. 4. Indicators of adaptation 5. Problems of its operationalization 6. Adaptation strategies	09

References

21. Adenle A., Azadi H., Arbiol J., 2015. Global assessment of technological innovation for climate change adaptation and mitigation in developing world, Journal of Environmental Management, 161 (15): 261-275.
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40. Vatal, M (1986): *Bhautik Bhugol*, Central Book Depot, Allahabad.

Course Code - GGMIP-462 Climate Change, Vulnerability and Adaptation**Course Type-Practical****No. of Credits: 02****No of periods:15****Course Outcomes:**

After the completion of the course, the students will have the ability to:

1. To make the students aware of the significance & importance of climate change in the world.
2. Basic understanding of concepts of climate change
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4. To inform about the necessity of incorporating and considering the changing climate in various long-term planning and development activities.

Module	Topic	Sub Topic	Lectures
Module 1	Introduction	1. Introduction, Concepts of Weather & Climate Change, Concepts of vulnerability, Concept of adaptation	02
	Weather Sign & Symbols & Instruments	Introduction, Weather Sign & Symbols, Weather Instruments, Weather Instruments Applications	04
Module 2	Climatic Diagrams	Introduction, Wind Rose, Climatograph, Climograph, Hythergraph	03
	Study of Climatic Hazards	1. Study of Climatic Hazards 2. Cyclones 3. Drought 4. Tsunami	03
	Field Visit	Visit to Exploration	03

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40. Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad.

On Job Training - Individual Student OJT

Course Code - GGOJP-461

No. of Credits: 04

No of periods:120

Course Objectives:

- 1. To give hands-on experience and practical training to students in different sectors related to geography**
- 2. To develop marketable skills among students**
- 3. To expose students to different industrial, educational and research institutes and future employers**
- 4. To apply their knowledge in real situations**
- 5. To gain experience in writing technical reports**

Course Outcomes:

After the completion of the course, the students will have the ability to:

- 1. embrace different pathways of learning, including experiential learning**
- 2. understand the social, economic and administrative considerations that influence the working environment of different organizations**
- 3. learn new strategies like time management, multi-tasking and new skills**
- 4. get an opportunity to meet new people and learn networking skills**

P. D. E. A's.
Prof. Ramkrishna More College, Akurdi, Pune 411044
Department of Geography
Board Geography
Faculty Science and Technology
Graduate and Honors Degree Course Framework under Autonomy as per NEP-2020
With effects from 2025-26
Question Paper pattern

Marks: 70		Time: 3 Hour	
Instructions to the Candidate:			
1. All questions are compulsory.			
2. Figures to right indicate full marks.			
3. Use of Log table and scientific calculator is allowed.			
Question-1	Solve Any five of the following (Short Answers) i. ii. iii. iv. v. vi. vii.	Three def. type, two tricky questions and two questions problem type (if applicable)	10 Marks
Question-2	A. Solve any two of the following i. ii. iii.	Note or Describe type questions	12 Marks
	B. Solve the following Single question of four marks or two questions of 2 marks.	Problem type or tricky reasoning type question	8 marks
Question-3	A. Solve any two of the following i. ii. iii.	Write Note / Differentiate type questions	12 Marks
	B. Solve the following Single question of four marks or two questions of 2 marks.	Problem type or Derive equation or Tricky discussion type question	8 marks
Question-4	Solve Any four of the following i. ii. iii. iv. v.	Application type, Justification type question	20

P. D. E. A's.
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Department of Geography
Board Geography
Faculty Science and Technology
Graduate and Honors Degree Course Framework under Autonomy as per NEP-2020
With effects from 2025-26
Question Paper pattern

Marks: 35		Time: 2 Hour	
Instructions to the Candidate: 1. All questions are compulsory. 2. Figures to right indicate full marks. 3. Use of Log table and scientific calculator is allowed.			
Question-1	Solve Any five of the following (Short Answers) i. ii. iii. iv. v. vi. vii.	Three def. type, two tricky questions and two questions problem type (if applicable)	5 Marks
Question-2	A. Solve any two of the following i. ii. iii.	Note or Describe type questions	6 Marks
	B. Solve the following Single question of four marks or two questions of 2 marks.	Problem type or tricky reasoning type question	4 marks
Question-3	A. Solve any two of the following i. ii. iii.	Write Note / Differentiate type questions	6 Marks
	B. Solve the following Single question of four marks or two questions of 2 marks.	Problem type or Derive equation or Tricky discussion type question	4 marks
Question-4	Solve Any four of the following i. ii. iii. iv. v.	Application type, Justification type question	10