

(Abstract)

Revised Scheme, Syllabus and Model Question Papers of M.Sc. Geography Programme (CBCSS)
w.e.f. 2020 Admission -implemented - Orders issued.

ACADEMIC C SECTION

Acad/C4/12621/2020

Dated: 11.01.2021

- Read:-1. Minutes of the meeting of the Syndicate held on 26.10.2019, vide item No.
2019.676
2. U.O.No.Acad C3/22373/2019. dated 08.10.2020
 3. U.O.No.Acad/C3/22373/2019, dated 12.11.2020
 4. The Minutes of the meeting of the Department Council, Dept. of Geography held on 08.12.2020
 5. Letter dtd 19-10-2020 from Head, Dept. of Geography, along with the revised Scheme, Syllabus and model question papers of the M.Sc. Geography Programme (CBCSS)

ORDER

1. The meeting of the Syndicate held on 26.10.2019 resolved vide paper read (1) above to revise the Scheme and Syllabus of all Post Graduate Programmes under Choice Based Credit Semester System (CBCSS) in the Schools/ Departments of University with effect from 2020 admission.
2. Subsequently, the Curriculum Committee was reconstituted as per paper read (2) above to monitor and co-ordinate the working of the Choice based Credit Semester System.
3. Accordingly, the revised Regulations for P.G. Programmes under Choice Based Credit Semester System were implemented in the Schools/Departments of the University with effect from 2020 admission as per the paper read (3) above.
4. Further, the Department Council, vide paper read (4) above, approved the revised Scheme, Syllabus and Model Question papers of the M.Sc. Geography programme under Choice Based Credit Semester System, for implementation in the Department of Geography, Swami Anandatheertha Campus, Payyannur, w.e.f 2020 admission.
5. Subsequently, the revised Scheme, Syllabus & Model Question Papers of M.Sc. Geography programme, prepared in line with the revised Regulations for Choice Based Credit Semester System was duly scrutinised by a Subject Expert and the Subject Expert recommended the Syllabus for implementation.
6. Thereafter, the revised Scheme, Syllabus & Model Question Papers of M.Sc. Geography programme (CBCSS) was forwarded by the Head, Dept. of Geography, as per paper read (5) above, for implementation with effect from 2020 admission.

7. The Vice Chancellor, after considering the matter in detail and in exercise of the powers of the Academic Council conferred under section 11 (1) Chapter III of Kannur University Act 1996 accorded sanction to implement the revised Scheme, Syllabus and Model Question Papers of the M.Sc. Geography programme under Choice Based Credit Semester System, in the Department of Geography, Swami Ananda Theertha Campus, Payyannur, Kannur University, with effect from 2020 admission, subject to reporting to the Academic Council.

8. The revised Scheme, Syllabus and Model Question Papers of the M.Sc. Geography programme (CBCSS), implemented with effect from 2020 admission, are uploaded in the University Website. (www.kannuruniversity.ac.in).

Orders are issued accordingly.

Sd/-

BALACHANDRAN V K
DEPUTY REGISTRAR (ACAD)
For REGISTRAR

To: The Head, Dept. of Geography
Swami Anandatheertha Campus, Payyanur, Kannur - 670327

Copy To: 1. The Examination Branch (through PA to CE).
2. PS to VC / PA to PVC / PA to R
3. DR / AR I/AR II (Acad).
4. The Computer Programmer (for uploading in the Website)
5. SF / DF /FC

Forwarded / By Order


SECTION OFFICER





KANNUR UNIVERSITY

Master of Science (GEOGRAPHY)

REGULATIONS, SCHEME AND SYLLABUS

Choice Based Credit Semester System
(Effective from 2020 admission)

**DEPARTMENT OF GEOGRAPHY
KANNUR UNIVERSITY**

**Swami Anandatheertha Campus
Payyannur, Edat P.O, Kannur 670 327**

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KANNUR UNIVERSITY

REGULATIONS FOR POST GRADUATE PROGRAMMES UNDER CHOICE BASED CREDIT SEMESTER SYSTEM IN THE DEPARTMENTS/SCHOOLS EFFECTIVE FROM 2020 ADMISSION

1. SCOPE

- 1.1 These Regulations shall apply to all the Post Graduate programmes, including P.G. Diploma and Certificate Courses conducted by the Departments/Schools of Kannur University
- 1.2 Choice based Credit Semester System presupposes academic autonomy, cafeteria approach in academic environment, semester system, course credits, alphabetical grading and interdepartmental academic collaboration. There shall be a Department Council consisting of all the Permanent/Contract teachers of the Department. The Head of the Department shall be responsible for admission to all the programmes offered by the Department including conduct of entrance tests, verification of records, admission and evaluation. The Department Council will deliberate on courses and specify the distribution of credits semester wise and course wise. For each course it will specify the number of credits for lectures, tutorials,, practicals etc.
- 1.3 These regulations shall come into effect from 2020 admission onwards and supersede all other Regulations unless otherwise prescribed.

2. DEFINITIONS

- 2.1 Curriculum Committee means the Committee constituted by the Vice-Chancellor under these Regulations to monitor the running of Choice based Credit Semester System. One of the Senior Professors shall be the Convenor of the Curriculum Committee co-ordinating the various academic activities
- 2.2 Department/Centre/School means Department/Centre/School instituted in the University as per Kannur University Statutes.
- 2.3 '**Academic Programme**' means an entire course of study comprising its programme structure, course details, evaluation schemes etc. designed to be taught and evaluated in a teaching Department/Centre or jointly under more than one such Department/Centre
- 2.4 '**Course**' means a segment of a Programme limited to one semester in a subject.
- 2.5 '**Programme Structure**' means a list of courses (Core, Elective, and Open Elective) that makes up an Academic Programme, specifying the syllabus, credits, hours of teaching, evaluation and examination schemes, minimum number of credits required for successful completion of the programme etc.

prepared in conformity with University Rules

- 2.6 **‘Core Course’** means a course that a student admitted to a particular programme must successfully complete to receive the degree, and which cannot be substituted by any other course.
- 2.7 **‘Elective Course’** means an optional course to be selected by a student out of such courses offered in the same Department/Centre.
- 2.8 **‘Open Elective’** means an elective course which is available for students of all programmes, including students of same department. Students of other Departments may opt these courses subject to fulfilling of eligibility criteria as laid down by the Department offering the course.
- 2.9 **‘Credit’** means the value assigned to a course which indicates the level of instruction; Normally, one hour lecture per week equals 1 Credit, 2/3 hours practical class per week equals 1 credit. Credit for a practical could be proposed as part of a course or as a separate practical course
- 2.10 **‘SGPA’** means Semester Grade Point Average calculated for individual semester.
- 2.11 **‘CGPA’** is Cumulative Grade Points Average calculated for all courses completed by the students in the last year of the course by clubbing together SGPA of four semesters

3. ELIGIBILITY FOR ADMISSION

3.1 Candidates, who have passed B.Sc/B.A Geography with a minimum of 50% marks in part III (Main and subsidiaries together) of this University or an equivalent examination of any other University, are eligible for admission to M.Sc. Geography of the Kannur University. Double main or triple main with Geography as one of the main subjects will be considered only in the absence of qualified candidates with single main.

3.2 Candidates who have passed their qualifying examination from Universities outside Kerala and candidates who have passed their degrees with different nomenclature from the Universities within Kerala, should submit Recognition/Equivalency Certificate while seeking admission.

4. ADMISSION

4.1. As per the regulations prescribed by the University Departments for each Programme from time to time. However, blind/deaf candidates are not eligible for admission to the course.

4.2 Admission to the PG programme of the University departments shall be made purely on the basis of Entrance Examination. Newspaper notification in this regard has to be made in the month of May itself. Entrance Examination is

mandatory for all the departments even if the number of applicants are less than the sanctioned strength. If the number of candidates admitted based on the Entrance Exam is less than the sanctioned strength, the concerned department can fill the vacancy by making necessary press release by fulfilling the reservation norms on the basis of the marks obtained in the qualifying examination.

4.3 There should be uniformity in the date of starting the courses and conducting the End Semester Examination of different PG programmes of the University.

5. REGISTRATION

- 5.1 Every Department/School shall have Permanent / Contract faculty members as Student Advisors. Each student at the time of admission will be assigned to an advisor by the Department Council. He/she will advise the student about the academic Programme and counsel on the choice of courses depending on the student's academic background and objective. The student will then register for the courses she/he plans to take for the semester before the classes begin.
- 5.2 The Department offering any course shall prescribe the maximum number of students that can be admitted taking into consideration the facilities available. The Department Council will be the authority to fix the optionals (elective and open elective courses) that can be offered for a Programme while ensuring that sufficient choice is given to each student in all semesters. However, in semester I, the students are advised to take the courses (core/elective) offered by the parent department. The elective/open elective courses that can be opted by the students in the next semester will be announced within 10 days after completion of a semester.
- 5.3 The student has to complete the prescribed prerequisites for the course before registration. The student within a maximum of 10 working days after the commencement of the classes can change the Optional Course with the consent of HoD in consultation with the Advisor.
- 5.4 The Department shall make available to all students a bulletin listing all the courses offered in every Semester specifying the Credits, list of topics the course intends to cover, the name of the instructor, the timetable and examination schedule. This will be made available in the last week of each semester after it is approved by the Department Council, the Dean and the Vice Chancellor.

6. COURSE STRUCTURE

- 6.1 Three kinds of Courses are offered - Core, Elective and Open Elective Courses (including MOOC courses). Core and Elective Courses are offered by the Department conducting the Programme. Open Elective Courses are offered either by the Department conducting the Programme or by any other Department/centres of the University or by other Institutions or via MOOC.

- 6.2 Open Elective Courses can be opted in any of the Semesters during the entire Programme other than the first semester. The maximum students that can be admitted to an Open Elective Course is limited to forty (40) except for MOOC courses. If the student intake in a department is more than 40, then the maximum number of students than can be admitted to an Open Elective Course is equal to the student intake.
- 6.3 Every Course offered by the University Department is identified by a unique course code. Where first two letters denote Programme name (MS for Master of Science). Next three letters denote subject. This is followed by semester number such as 01, 02, 03,04. After semester number single alphabet stands for Core (C). Elective (E) and Open Elective course (O). The last two digits denote the serial number of the course in that category (C, E or O) in that programme. MSGGY01C02 MS – Master of Science, GGY – Geography 01 – First Semester C – Core 02– Serial number of the Core course of the programme
- 6.4 Any course including a core course of one Department can be offered as an Open Elective Course to students of other Departments
- 6.5 The minimum duration for completion of a two year PG Programme in any subject is four (4) Semesters and the maximum period for completion is eight (8) Semesters from the date of registration. The minimum duration for completion of a one year PG programme in any subject is two (2) semesters and the maximum period for completion is four (4 semesters) four years from the date of registration.
- 6.6 Zero semester : A Semester in which a student is permitted to opt out due to unforeseen genuine reasons
- 6.7 No regular student shall register for more than 24 credits and less than 16 credits per Semester, subject to the provisions of the Programme concerned.
- 6.8 The total credits required for the successful completion of a four semester Programme will be between 72 to 80. For science subjects core credits should not exceed 70 per cent of the total required credits.
- 6.9 The Department Council shall design the Core, Elective and Open Courses including the detailed syllabus for each Programme offered by the Department. The Department Council shall have the freedom to introduce new courses and/or to modify/redesign existing Courses and replace any existing Course with a new Course to facilitate better exposure and training for the students, with the approval of the Faculty Council and the Academic Council.

7. EVALUATION

- 7.1 Evaluation of the students shall be done by the Faculty member who teaches the Course on the basis of Continuous Evaluation and an End Semester Examination. The proportion of the distribution of marks among End Semester Examination and Continuous Evaluation shall be 60:40.

7.2 Continuous Evaluation includes Assignments, Seminars, periodic written examinations etc.

7.3 The allocation of marks for each component under Continuous Evaluation shall be in the following proportions:

Theory		Practical	
Components	% of marks	Components	% of marks
Test papers	40% (16 marks)	Tests	75% (30 marks)
Tutorial with viva, Seminar presentations, Discussion, Debate etc relevant to the course	40% (16 marks)	Record	25% (10 marks)
Assignment	20% (8 marks)		
Total Internal marks	40	Total internal marks	40

7.4 Mode of assessment ie., administering of Test or Tutorial will be decided by individual departments

7.5 A copy of all records of Continuous Evaluation shall be maintained in electronic format in the Department and shall be made available for verification by the University.

7.5 Performance of each student in an assessment shall be intimated to him/her within two weeks of the conduct of test/ submission of assignment/ report.

8. CONDUCT OF THE END SEMESTER EXAMINATION

8.1 The End Semester Examinations of each semester will be conducted by the Controller of Examinations. It will be the responsibility of the Department to maintain a sufficient balance of different levels of questions in the Question Bank. The tabulation registers of each Semester shall be prepared and maintained by the Examination Branch. There shall be a minimum of one external examiner to ensure transparency in the conduct of examinations. The external examiners will be faculty members appointed from other Colleges/Departments of this University or from other Universities. The duration of End Semester Examination shall be specified in the curriculum.

8.2 The Board of Examiners (including the external examiner) will function as the Pass Board and will be called the Moderation Committee with the Head of the Department or a nominee of the Vice Chancellor as its Chair.

8.3 After valuation of the scripts, the moderation committee will be convened and marks awarded to each student in a course will be presented by the examiners in the committee. Average mark for each course is calculated and compared with that of other courses. If the average mark is significantly different for any course compared to other courses, it will be normalized by the examiner to avoid the significant deviation. The external examiner should be present in the meeting.

8.4 The mark-lists so finalized by the Moderation Committee (Pass Board) will be forwarded to Controller of Examinations by the Chairman of the Board of Examiners

9. ATTENDANCE

9.1. The minimum attendance required for each Course shall be 60% of the total number of classes conducted for that semester. Those who secure the minimum attendance in a semester alone will be allowed to register for the End Semester Examination. Condonation of attendance to a maximum of 10 days in a Semester subject to a maximum of two spells within a Programme will be granted by the Vice-Chancellor. Benefit of Condonation of attendance will be granted to the students on health grounds, for participating in University Union activities, meetings of the University Bodies and participation in extracurricular activities on production of genuine supporting documents with the recommendation of the Head of the Department concerned. A student who is not eligible for Condonation shall repeat the Course along with the subsequent batch.

10. GRADING

10.1 An alphabetical Grading System shall be adopted for the assessment of a student's performance in a Course. The grade is based on a 6 point scale. The following table gives the range of marks %, grade points and alphabetical grade.

Range of Marks %	Grade Points	Alphabetical Grade
90-100	9	A+
80-89	8	A
70-79	7	B+
60-69	6	B
50-59	5	C
Below 50	0	F

10.2 A minimum of grade point 5 (Grade C) is needed for the successful completion of a Course. A student who has failed in a Course can reappear for the End Semester Examination of the same Course along with the next batch without taking re-admission or choose another Course in the subsequent Semesters of the same programme to acquire the minimum

credits needed for the completion of the Programme. There shall not be provision for improvement of CE and ESE. A student can sit the ESE again if she/he has successfully completed the CE requirements in a subsequent semester subject to the maximum durations permitted.

10.3 Performance of a student at the end of each Semester is indicated by the Semester Grade Point Average (SGPA) and is calculated by taking the weighted average of grade points of the Courses successfully completed. Following formula is used for the calculation. The average will be rounded off to two decimal places.

$$\text{CGPA} = \frac{\text{Sum of (grade points in a course multiplied by its credit)}}{\text{Sum of Credits of Courses}}$$

10.4 At the end of the Programme, the overall performance of a student is indicated by the Cumulative Grade Point Average (CGPA) and is calculated using the same formula given above.

10.5. Empirical formula for calculating the percentage of marks will be

$$\% \text{ Marks} = (\text{CGPA} \times 10) + 5.$$

10.6 Based on the CGPA overall letter grade of the student and classification shall be in the following way.

CGPA	Overall Letter Grade	Classification
8.5 and above	A+	First Class with Distinction
7.5 and above but less than 8.5	A	
6.5 and above but less than 7.5	B+	First Class
5.5 and above but less than 6.5	B	
5 and above but less than 5.5	C	Second Class

10.7 Appearance for Continuous Evaluation (CE) and End Semester Evaluation (ESE) are compulsory and no Grade shall be awarded to a candidate if he/she is absent for CE/ESE or both.

10.8 A student who fails to complete the Programme/Semester can repeat the full Programme / Semester once, if the Department Council permits to do so. Absence in an examination will be marked zero.

10.9 No student shall be allowed to take more than eight/twelve consecutive Semesters for completing a four/six Semester Programme from the date of enrolment.

11. GRADE CARD

11.1. The Controller of Examinations shall issue the grade cards of all semesters and the consolidated grade card and certificates on completion of the programme, based on the details submitted by the Heads of the

Departments concerned. This will be in digital form only.

11.2. The Grade Card shall contain the following

- a) Title of the Courses taken as Core, Elective & Open Elective.
- b) The credits associated with and grades awarded for each Course.
- c) The number of credits (Core / Elective / Open) separately earned by the student and the SGPA.
- d) The total credits (Core / Elective / Open) separately earned by a student till that Semester.

11.3. The consolidated grade statement issued on completion of the Programme shall contain the name of the Programme, the Department/School offering the Programme, the title of the Courses taken, the credits associated with each Course, grades awarded, the total credits (Core / Elective / Open) separately earned by the student, the CGPA and the class in which the student is placed. Rank Certificates will be issued based on CGPA calculated at the end of the last semester of that Programmes.

12. DEPARTMENT COUNCIL

12.1 All the Permanent and Contract teachers of the Department shall be the members of the Department Council

12.2 The Department Council subject to these Regulations shall monitor every academic programme conducted in the Department

12.3 Department Council shall prescribe the mode of conduct of courses, conduct of examinations and evaluation of the students.

12.4 An elected student representative also may attend the department council meeting where agenda related to academic matters/research activities of students are discussed.

13. CURRICULUM COMMITTEE

13.1 There shall be a Curriculum Committee constituted by the Vice Chancellor to monitor and co-ordinate the working of the Choice based Credit Semester System

13.2 A Senior Professor nominated by the Vice Chancellor shall be the Convener of the Curriculum Committee

13.3 The Committee shall consist of :

- a) Vice-Chancellor or person nominated by VC (Chairperson)
- b) The Convener of the Curriculum Committee (A Professor of the University nominated by the Vice Chancellor)
- c) The Registrar-Secretary
- d) The Controller of Examinations - Member
- e) Deans - Members
- f) The Heads of Departments – Members

13.4 The term of office of the Committee shall be two years, but the Committee once constituted shall continue in office until a reconstituted committee assumes office.

14. ACADEMIC GRIEVANCE REDRESSAL MECHANISM

14.1 Committees will be constituted at the Department and University levels to look into the written complaints regarding Continuous Evaluation (CE). Department Level Committee (DLC) will consist of the Department Council, and elected student representatives who is currently a student of that Programme of study. There will be one student representative for the post graduate programmes and one student representative for the doctoral programme.

14.2 University Level Committee (ULC) will consist of the Convenor of the Curriculum Committee, the concerned Dean, the concerned Head of the Department and a nominee of the Students' Union

14.3 Department Level Committee will be presided over by the HoD. Complaints will have to be submitted to the Department concerned within two weeks of publication of results of Continuous Evaluation (CE) and disposed of within two weeks of receipt of complaint. Appeals to University Level Committee should be made within two weeks of the decisions taken by Department level Committee and disposed of within two weeks of the receipt of the complaint.

14.4 Complaints unsolved by the University level Grievance Committee shall be placed before the Vice Chancellor.

15. TRANSITORY PROVISION

15.1 Notwithstanding anything contained in these regulations, the Vice Chancellor shall for a period of one year (may be revised) from the date of coming into force of these regulations, have the power to provide by order that these regulations shall be applied to any Programme with such modifications as may be necessary.

16. REPEAL

16.1 The Regulations now in force in so far as they are applicable to programmes offered in the University Departments and to the extent they are inconsistent with these regulations are hereby repealed. In the case of any inconsistency between the implemented regulations of Choice based Credit Semester System and its application to any independent programme offered in a University Department, the former shall prevail.

SCHEME AND SYLLABII FOR M.Sc. GEOGRAPHY PROGRAMME (CBCSS)

For the University Departments effective from 2020 Admission onwards

About the Department

The Post Graduate Department of Geography of Kannur University was established in 2003 with an intake of 12 students and housed in a rented building at Edat, about two kilometres from Payyanur town towards south. Subsequently, the Department was shifted to Swami Anandatheertha Campus of Kannur University in 2007. From the academic year 2012-13 onwards the sanctioned strength of the students for the M.Sc Degree has been enhanced to 17. In addition to this, one seat has been sanctioned to accommodate a student in each year from Lakshadweep islands. The course is being offered under Choice Based Credit and Semester System. The design of the semesters are in such a way that the students learn topics common to the general M.Sc. course in Geography of the University and specific application oriented topics in Geoinformatics. The students have to undertake a project and a field study in the final semester of the course. The major objective of the course is to train students to get an integrative perspective about the world and earth related phenomena. The Department of Geography with a vision of achieving excellence and to promote professional education in the field of geography, has been developing itself with better infrastructural facilities and qualified faculties for undertaking a full range of degree programmes from post graduate to Ph.D courses in Geography. The Department was able to conduct academic and research oriented activities in many emerging and frontier areas of geography and there are many agendas to be fulfilled in this regard. In the field of research oriented activities the Department has successfully completed two minor projects funded by Kannur University. Behind every successful achievements of the Department the infrastructural facilities and sincere effort of faculties always stood as a strong support. At present the Department of Geography is well equipped with the basic infrastructural facilities which include smart class rooms, library, GIS and Remote Sensing lab, Cartography lab and Geodesy lab. The Department is planning for conducting multiple courses in future which requires development of the Department of Geography as a Center of Excellence

THE PROGRAMME

The Department's Master's Programme – "**Master of Science in Geography**", is a **two-year program**, spread over **four semesters**, and comprising **20 courses of 80 credits**

PROGRAMME OBJECTIVE

The aim of Master of Science in Geography programme is to provide up to date instruction to our students to meet the requirement of trained manpower in Geography for teaching, research, technological and other vocations mainly to benefit the aspiring students and to contribute to society in a responsible way.

CHOICE BASED CREDIT SEMESTER SYSTEM

The Choice Based Credit Semester System provides an opportunity for the students to choose courses from the prescribed courses comprising core and elective courses. The courses are evaluated following the grading system, which provides uniformity in the evaluation and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations which enables the student to move across institutions of higher learning. The uniformity in evaluation system also enables the potential employers in assessing the performance of the candidates.

PROGRAMME OUTCOMES (POs) for Post-Graduation

- PO1.** Demonstrate a degree of mastery, at a level higher than the requirements in the appropriate Bachelor programme, over the area of the specialization of the programme
- PO2.** Carry out research independently and/or jointly in disciplinary or interdisciplinary areas.
- PO3.** Write and present a substantial report/document on issues or problems of concern to the programme
- PO4.** Demonstrate the ability to engage in independent and life-long learning in the broadest context of socio-technological changes

PROGRAMME SPECIFIC OUTCOMES (PSOs) OF M .Sc GEOGRAPHY

All the post graduate courses are at advanced level, and have been constructed as continuity over the under-graduate courses, which are seen as basic, and are taught at foundation level. The present structure thus covers the foundational aspects of the discipline, and also builds towards specialization. Programme Specific Outcomes (PSOs) of M.Sc Geography of Kannur University are given below:

PSO1. Analyse the dimensions of complex biophysical and social patterns in the world, and mold out young geographers with wide and deep knowledge about contemporary issues in geography.

PSO2. Critically examine various concepts, laws, theories, and models in geography and evaluate their significance at the local, regional, and global scales.

PSO3. Master and update the students in the developments in geographic information science and technology, through real-world practical applications

PSO4. Equip the learner to collect, analyze, and interpret geographic data and suggest potential solutions in socio-economic-ecological systems at the man-environment interface.

PSO5. Apply systems thinking as well as critical thinking skills to analyze contemporary issues and encourage inter-disciplinarily, multi-disciplinarily and trans-disciplinarily for developing a responsible geo community

The courses offered in the programme are addressing various dimensions and developments of the discipline and can be classifiable as follows

- A. Theoretical Base of Geography** – Courses on Nature and Philosophy of Geography, Environmental Geography, Advanced Geomorphology, Climate and Climate change, Urban geography etc builds up the theoretical and ideological foundations of geography.
- B. Methodological Base in geographical analysis**–Courses on Quantitative Techniques in Spatial Analysis; Principles of Remote Sensing, Principles of Geographical Information System, Natural Resource Management, Research Methods in Geography etc. strengthens the methodological foundations of Geography.
- C. Systematic Approach** –Courses on Geography of Health , Integrated Watershed Management and Planning, Contemporary Human Geography, Modern Economic Geography , Geography of Tourism, etc address the contemporary issues in Geography, both physical and human.
- D. Regional perspective** – Papers like Advanced Geography of India, Kerala Environment and Development, Geographies of Gender and Development in South Asia etc perceive the regional dimensions of geography in a non-conventional way.
- E. Lab exercises & Field techniques** – Four core courses are included as *Practicals*, to equip the learner to handle the advanced tools and techniques of geographical analysis, in all semesters.
- F. Case study & Applications** – Courses on Integrated Watershed Development and Planning, Applied Geomorphology, Geo-informatics, Geography and Disaster Management etc are intended to carry out problem issue based and micro level analysis. Student has to carry out a Dissertation in the last semester.

Kannur University M.Sc. Geography Programme

Curriculum Structure

I Semester

Paper No.	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
MSGGY01C01	Nature and Philosophy of Geography	4	1	-	60	40	100	4
MSGGY01C02	Advanced Geomorphology	4	1	-	60	40	100	4
MSGGY01C03	Climate and Climate Change	4	1	-	60	40	100	4
MSGGY01E01 OR	Hydrology and Water Resource Management	4	1	-	60	40	100	4
MSGGY01E02 OR	Integrated Watershed Management and Planning							
MSGGY01E03 OR	Geography of Tourism							
MSGGY01E04	Geography of Health							
MSGGY01C04	Practical – I Interpreting Physical Geography	-	-	10	60	40	100	4
	Total	30			300	200	500	20

II Semester

Paper No.	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
MSGGY02C05	Regional Planning and Development	4	1	-	60	40	100	4
MSGGY02C06	Principles of Remote Sensing	4	1	-	60	40	100	4
MSGGY02E05 OR	Environmental Geography	4	1	-	60	40	100	4
MSGGY02E06 OR	Modern Economic Geography							
MSGGY02E07	Geography of Settlements							
MSGGY02E08 OR	Advanced Geography of India	4	1	-	60	40	100	4
MSGGY02E09 OR	Environmental Impact Assessment							
MSGGY02E10	Social Impact Assessment							
MSGGY02C07	Practical – II Quantitative techniques for spatial analysis	-	-	10	60	40	100	4
	Total	30			300	200	500	20

III Semester

Paper No.	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
MSGGY03C08	Principles of Geographic Information System	4	1	-	60	40	100	4
MSGGY03C09	Urban Geography	4	1	-	60	40	100	4
MSGGY03E11 OR	Research Methods in Geography	4	1	-	60	40	100	4
MSGGY03E12 OR	Political Geography							
MSGGY03E13 OR	Natural Resource Management							
MSGGY03E14	Contemporary Human Geography							
MSGGY03E15 OR	Population and Welfare Geography	4	1	-	60	40	100	4
MSGGY03E16 OR	Geographies of Gender and Development in South Asia							
MSGGY03E17 OR	Social Geography with special reference to India							
MSGGY03E18	Applied Geomorphology- Coast and River Management in Kerala							
MSGGY03C10	Practical– III Cartographic techniques for spatial analysis	-	-	10	60	40	100	4
	Total	30			300	200	500	20

IV Semester

Paper No.	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
MSGGY04C11	Geography of Agriculture and Land Use Planning	4	1	-	60	40	100	4
MSGGY04001 OR	Kerala- Environment and Development	4	1	-	60	40	100	4
MSGGY04002 OR	Geography and Disaster Management: Kerala perspective							
MSGGY04003	Urban Development and Management							
MSGGY04C12	Practical – IV Advanced Techniques of Geo-spatial analysis	-	-	10	60	40	100	4
MSGGY04C13	Dissertation	-	-	10	100	-	100	4

MSGGY04C14	Comprehensive Viva Voce and Study tour/ Field work report	-	-	-	75	25	100	4
	Total	30			355	145	500	20
	Grand Total (I – IV Sem)				1255	745	2000	80

MS – Master of Science
GGY – Geography
C – Core Course
E – Elective Course
O – Open course
P – Practical Course

L – Lecture
T – Tutorial
S – Seminar
CE – Continuous Evaluation
ESE – End Semester Examination

SEMESTER WISE CREDIT DISTRIBUTION

Course	Credit/ Paper	Semester I		Semester II		Semester III		Semester IV		Total Credits
		No. of papers	Credit	No. of papers	Credit	No. of papers	Credit	No. of papers	Credit	
CORE	4	4	16	3	12	3	12	4	16	56
ELECTIVE	4	1	04	2	08	2	08	--	--	20
OPEN ELECTIVE	4	--	--	--	--	--	--	1	04	04
TOTAL		5	20	5	20	5	20	5	20	80

SEMESTER I
CORE COURSE 1

Course Title and Code	MSGGY01C01	NATURE AND PHILOSOPHY OF GEOGRAPHY		
Semester	Hours per week	Credit	Exam. Hours	Marks
I	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To know that Geography as a discipline has evolved with time and has remained dynamic. • To understand that geographical scholarship is intimately related larger to the ensuing socio-political processes that exists during different time periods • To analyse the influence of various philosophical perspectives on contemporary geography • To know that the ever-changing content and direction of the discipline by the scholars makes the discipline relevant and compelling
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Modules	Content	No. of hours
Module 1 Nature and evolution of discipline geography	Geography as a discipline; Basic concepts in the philosophy of geography- Historical development of Geographical thought- contributions to ancient, medieval and modern phases of geography. Multidisciplinary nature of Geography - Conceptual developments: Laws, Theories and models in Geography, Spatial analysis, Locational analysis, Systems approach and analysis, Aerial Differentiation, Regional synthesis, Spatial integration and Diffusion of innovation.	24
Module 2 Influences in Conceptual development of Geography	Imperialistic influences in Conceptual nature of Geography – a historical discourse, Thomas Kuhn’s model of ‘paradigms of science’; Darwin’s influences in geographical knowledge; Imperialism and colonialism; Institutionalization of geography; - Four Traditions in Geography: Dualism and dichotomies in Geography – Environmental determinism and critics.	15
Module 3 Philosophical Influences on Modern Geographical Thought	Philosophical Influences on Modern Geographical Thought – Anarchism, Positivism, Quantitative Revolution, Pragmatism, Functionalism, Humanism, Behaviouralism, Existentialism, Idealism, liberal & Radicalism, Marxism, Welfare approach in geography; Geography as Human ecology; Feminist Geography. Post – modern geographies with special reference to Third space by Edward Soja.	20

Module 4 Post colonial Geographies	Post structuralism and Post colonialism - Subaltern geographies, Alternative geographical traditions, Geographies of Sexuality and Queer approach. Decolonising geography- Geographers and models of disciplinary progress; Inequality, Justice and ethics; Geography of Poverty (GOP); Geographers and policy; Changing contexts and applied geography; Development of geographical thoughts in India; Institutionalisation of geography in India; Postcolonial Geographies of India	21
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Essential Readings

1. Adhikari S. (1992), Geographical thought, Chaithanya Publishing House, Allahabad.
2. Arild Hot-Hensen (2009), Geography, History and Concepts: A Student's Guide, SAGE Publications
3. Bassin, M.: (1987) Imperialism and the Nation State in Friedrich Ratzel's Political Geography, Prog. Hum. Geog., 11, 473-495, 1987
4. Benko, Georges, Strohmayr, Ulf,(1997). Space and Social Theory, Blackwell Publishers.
5. Bonnett, Alastair, 2008. What is geography? Sage Publications.
6. Castree, R, A. Rogers and D. Sherman, (2005). Questioning Geography: Fundamental Debates, Blackwell.
7. Crang, Mike and Nigel Thrift, (2000). Thinking Space, Routledge.
8. Cresswell, Tim, (2013). Geographic Thought: A Critical Introduction, Wiley Blackwell.
9. David Harvey (2000) Explanations in Geography, Macmillan, New York
10. Dikshit R.D (2007), Geographical Thought – A contextual History of Ideas, Prentice Hall of India, New Delhi.
11. Ellen Churchill Semple (1911) Influence of Geographic Environment on the Basis of Ratzel's System of Anthro-geography. New York: Russell and Russell.
12. Frazier J.W (1982) Applied Geography, Prentice Hall, New Delhi
13. Gillian Rose (1993) "Feminism and Geography: An Introduction" and "Women and Everyday Spaces," in Feminism and Geography: The Limits of Geographical Knowledge (Minneapolis: University of Minnesota Press.
14. George Henderson and Marvin Watersone (Ed.) (2009) Geographic Thought – A Praxis perspective, Routledge
15. Hartshorne R (1959), Perspectives of Nature of Geography, Rand McNally Co, Chicago
16. Harvey, D (1969) Explanation in Geography, London, Arnold
17. Harvey M E (2002) Theme in Geographical thought, R.K. Publications and Distributors, Ansari Road, New Delhi-2
18. Holt Jensen Arid (1999). Geography: History and Concepts, Sage Publications.
19. Hubbard, Phil., Kitchin, Rob., Bartley Brendan and Duncan Fuller, (eds) (2002). Thinking Geographically: Space, Theory and Contemporary Human

Geography, Continuum

20. Johnson R J (1985), The Future of Geography, Metheun
21. John Agnew and David N. Livingstone. The SAGE Handbook of Geographical Knowledge, pp. 51-136, 149-184, 217-227.
22. Linda McDowell and Doreen Massey (1984), "A Woman's Place?" pp 458-475 in J. Agnew, D. Livingstone and A. Rogers (eds) Human Geography: an Essential Anthology, Oxford: Blackwell,
23. Majid Hussain (2007), Evolution of Geographical thought, Rawat Publication. Jaipur.
24. Minshull R (2014), The Changing Nature of Geography, Routledge
25. Neil Roberts, "The Idea of Evolution in Geographic Thought", in John Agnew and David N. Livingstone. The SAGE Handbook of Geographical Knowledge, pp.441-451.
26. Nicholas Ropke 'Alexander von Humboldt and Revolution', in Livingstone and Withers. Geography and Revolution, pp. 336-350.
27. Richard Hartshorne (2002), The Nature of Geography, Rawat Publications, Jaipur.
28. Peet (2004), Modern Geographical thought, Blackwell Publishers, Oxford.
29. Peter Hagget (1972) Geography: A Modern Synthesis, Harper & Row
30. Satish Kumar (2006) Colonial and Post Colonial Geographies of India, SAGE Publications
31. Singh I (2006) Diverse aspect of Geographical thought: Alfa Publications, New Delhi
32. Ravi S. Singh, (2009) Indian Geography: Perspectives, Concerns and Issues, Rawat
33. Ronald Alber (1971) Spatial Organisation : The Geographer's View of the World, New Delhi.
34. Saraswathy Raju (2013), Gendered Geographies: Space and Place in South Asia", SAGE Publications
35. Stoddart, D.R. (1966) "Darwin's Impact on Geography," Annals of the Association of American Geographers, Vol. 56: 683-698.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Trace the historical evolution of the philosophy of geography</p> <p>CO2 Analyse the conceptual developments in the discipline and paradigm shifts</p> <p>CO3 Understand in wider sense, that geographical thought is always political</p> <p>CO4 Distinguishes the relationship between Geography's and Geographer's to the social and political struggles</p> <p>CO5 Demonstrate the inclusive nature of postmodern geographies and appreciate the metaphysical dynamism and academic progress of the discipline</p>

CORE COURSE 2

Course Title and Code	MSGGY01C02	ADVANCED GEOMORPHOLOGY		
Semester	Hours per week	Credit	Exam. Hours	Marks
I	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To examine the development of modern geomorphic thought and critical appreciation of fundamental concepts in geomorphology • To understand the relationships that exist between the landforms and the earth processes • To analyse and appreciate the processes in Tropical geomorphology with special reference to coastal and fluvial systems • To analyse the scope and significance of applied geomorphology and its applicability in engineering projects and managing disaster management
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Modules	Content	No. of hours
Module 1 Fundamental concepts	Nature of geomorphology- Development of modern geomorphic thought- branches, Fundamental concepts, Geological time scale- origin and evolution of earth crust- classification of landforms	22
Module 2 Land form development	Nature of endogenic and exogenic forces- catastrophism and diastrophism- Continental drift- Plate tectonics – Seafloor spreading –seismicity- recent theories of mountain building. Critical evaluation of landforms development theories – Gilbert, Davis, Penck, L C King, Hack, Denudation chronology- erosion surfaces. Study of hill slopes, slope evolution models of Davis, W. Penck, L.C.King and A.Wood	17
Module 3 Tropical geomorphology	Tropical processes and landforms- Weathering and mass wasting process and products– Rock and Soils processes. Fluvial processes and river valley development-drainage basin morphometry- channel dynamics and morphology, morphology of stream bed, sedimentation, dimensions of channel modification and characterization. Coastal Morphodynamics: Quantification and Interpretation of Coastal Processes- Identification and measurement of sedimentary and biogenic forms.	21
Module 4 Recent trends in geomorphology	Climatic geomorphology, Morphogenetic regions, Regional geomorphology, terrain analysis and modeling, anthropogenic geomorphology. applied Geomorphology, Geo-informatics and geomorphology	20

Essential Readings

1. Arthur L. Bloom (2003) *Geomorphology – A systematic Analysis of Late Cenozoic Landforms*, Pearson Education, Singapore.
2. Arthur N Strahler and Alan H Strahler (1998) *Modern Physical Geography*, John Wiley and Sons, Inc
3. Bloom, A.L. (1991): *Geomorphology*, 2nd Ed Englewood Cliffs, M.J. Prentice Hall
4. Brierley, G.J. & Fryirs, K.A. (2005): *Geomorphology and River Management*, Blackwell Publishing, Oxford UK.
5. Briggs, K. (1985): *Physical Geography Process and System*, Hodder and Stoughton, London
6. Chorley, R.J. Schumm, S.A. & Sugden, D.E. (1985): *Geomorphology*, Methuen & Co. Ltd., London, New York.
7. Christopherson, R.W. (1995): *Elemental Geosystems: A Foundation in Physical Geography*, Prentice Hall Englewood Cliffs, New Jersey.
8. Cook, R.U. & Doornkamp, J.C. (1974): *Geomorphology in Environmental Management, an Introduction*. Clarendon Press. Oxford
9. Darrel Hess (2012), *MCKNIGHT'S Physical Geography -A Landscape Appreciation*, PHI Learning Private Limited, New Delhi.
10. Dayal P (1996) *A Textbook of Geomorphology*, Shukla Book Depot, Patna, India
11. Fairbridge, R.W., ed. (1968): *Encyclopaedia of Geomorphology* Reinhold, New York
12. Hart, M.G. (1986): *Geomorphology Pure and Applied*, George Allen and Unwin, London
13. John P Miller and Luna Bergere Leopold, *Fluvial Processes in Geomorphology*
14. Kale V S and Gupta A (2010) *Introduction to Geomorphology*, Orient Longman, Calcutta
15. Leopold, L.B. Wolman, M.G. & Miller, J.P. (1964): *Fluvial Processes in Geomorphology*, W.H. Freeman, San Francisco
16. Lobeck, A.K. (1939): *Geomorphology*, McGraw Hill, New York. .
17. Moor, W.G. (1949): *A Dictionary of Geography*, Penguin Books, England.
18. Morgan, R.S. & Wooldridge S.W (1959): *Outline of Geomorphology the Physical basis of Geography*, Longmans Green, London
19. Pitty A F (1982) *The Nature of Geomorphology*, Methuen and Co. Ltd. London
20. Richard John Haggett (2003) *Fundamentals of Geomorphology*, Routledge, London.
21. Robinson, Harry (1969): *Morphology and Landscape*, University Tutorial Press Ltd. London
22. Spark, B. W. (1986): *Geomorphology*, Longman, London.
23. Strahler, A.N (1992): *Physical Geography*. John Wiley & Sons Inc., New York.
24. Thomas, M.F. (1974): *Tropical Geomorphology*, Macmillan, London
25. Thornbury W.D (1969) *Principles of Geomorphology*, Wiley Intl. Edn & Wiley Eastern Reprints 1984.
26. Verstappen H. (1983) *Applied Geomorphology, Geomorphological Surveys for Environmental Development*, Elsevier, Amsterdam
27. Wadia, D.N. (1993): *Geology of India*, Tata McGraw Hill Edition, New Delhi.
28. Wooldridge S W and R. S. Morgan (2004)–*The Physical Basis of Geography - An Outline of Geomorphology*, Orient Longman Private Limited.
29. Worcester, P. G. (1948): *Textbook of Geomorphology*, Princeton, D. Van, Norstrand.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>C01 Analyse the conceptual basis of geomorphology and its evolutionary phases</p> <p>C02 Understand the processes that sculpt surface features.</p> <p>C03 Assess the magnitude of tropical processes on the development and alteration of landforms</p> <p>C04 Critically analyse and interpret various approaches in landscape evolution</p> <p>C05 Acquire problem solving skills in the way of application of geomorphological principles in various contexts</p>

CORE COURSE 3

Course Title and Code	MSGGY01C03	CLIMATE AND CLIMATE CHANGE			
Semester	Hours per week	Credit	Exam. Hours	Marks	
I	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • To gain advanced knowledge about the climatic processes, their types and distribution • To analyse the influence of climate on the physical and human activities. • To learn the ensuing climate changes, their magnitude, causes and strategies which can be adopted for the mitigation of climate change. • To provide a rationale for climate change mitigation and to propose actions in the key sectors.
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Modules	Content	No. of hours
Module 1 Elements and controls of climate	Nature, Scope and Content of Climatology; Elements and controls of climate, Air Masses – Source Regions, Characteristics of air masses, identification, Modifications; - Fronts – Frontal types, Frontal weather, Polar Front Theory: Monsoons –Theories on the formation of monsoons; Regional Aspects of Indian Monsoon – Monsoon Trough, Easterly Jet stream, Tibetan High; Walker Circulation of the Equatorial Pacific Ocean- El Nino–La Nina, Impacts on Monsoons, Monsoon Forecast.	22
Module 2 Extreme Weather Phenomenon	Stability and instability; Thunderstorms, Cloud Bursts, Squalls, formations of Tornadoes, Downburst and Derecho - Tropical Cyclones – Recent tropical cyclones, Extra-Tropical Cyclones; Dust Storm, Hail Storms, Silver Storms, Blizzards, Heat Waves.	18
Module 3 Regionalization of climate	Climatic classifications of Koeppen, Trewartha and Thornthwaite, Weather forecasts - Collection and analysis of climatic data, their interpretation, Weather forecasting using satellite data. - Techniques and measurements for analyzing weather data, Weather industry.	15
Module 4 Interpreting Climatic change	Climate Change, Difference between climatic variability and change - Climatic changes in the past, present trends of climate change- Evidences- Possible causes – Greenhouse gases and aerosols. The International Climate Change Legal and Institutional Framework and key issues under negotiation: Sustainable Development Goals: International	25

	Climate Change Agreements and Local Governance, IPCC, Carbon foot print, Carbon credit, Initiatives of Governments of India and Kerala for Climate change adaptation.	
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Essential Readings

1. Aguado, E., and Burt, J.E. (2013): Understanding Weather and Climate, Pearson, New York, 552 pp.
2. Barry, R.G., and Chorley, R.J. (2010): Atmosphere, Weather and Climate, Routledge, London, 516 pp.
3. Byers R.H. (1974): General Meteorology, McGraw Hill BKCo New York.
4. Critchfield, H.J, (2009): General Climatology; Prentice Hall, London
5. Das P. K. (1995): The Monsoon, Prayag Pustak Bhavan, Allahabad, National Book Trust.India
6. Ela Dean, (2017); Principles of Atmospheric Science, Larsen and Keller Education, 249 pp.
7. Hobbs, J.E. (1980): Applied Climatology, Butterworth, London.
8. John E Oliver and John J Hidore 2003, Climatology – An Atmospheric Science, Pearson Education Private Limited, Delhi.
9. Lal D S (2003) Climatology, Sharda Pustak Bhavan, Allahabad.
10. Lutgens, F.K., and Tarbuck, E.J. (2013): The Atmosphere – An Introduction to Meteorology. Prentice Hall, Boston, 506pp.
11. Lydolph, P.E (1985) The Climate of the Earth, Rowman and Allanheld
12. Mather J. R. (1975): Climatology : Fundamentals & Applications. Mc Graw Hills Book Co., New York
13. Miller A., et, al. (1983); Elements of Meteorology, Merrill, Columbus
14. Oliver J. E. (1973): Climate & Mans Environment, John Wiley & Sons; New york
15. Robert V. Rohli, Anthony J. Vega, (2017): Climatology, Jones & Bartlett Learning; 4 edition,
16. Savindra Singh (2006) Climatology, Prayaga Pusthak Bhavan, Allahabad.
17. Siddhartha K (2005), Atmosphere, Weather and Climate, Kisalaya Publications Private Limited, Delhi.
18. Williams Sellers, (2014): Physical Climatology, New India Publishing Agency, 280 pp
19. Trewartha, G.T (1968) An Introduction to Climate, McGraw Hill Book Co. New York.
20. Woolridge and Morgan (2015) Physical Basis of Geography, Palala Press
21. Gilbert Loren, (2019) Concepts and Applications of Climatology, Syrawood Publishing House.
22. WMO No.8 (1983): Guide to Meteorological Instruments and Methods of observation

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Understand the mechanism of climatic phenomena.</p> <p>CO2 Understand the extreme weather phenomena, their occurrence and its impact.</p> <p>CO3 Classification of climate & analysis of climatic data, their interpretation, modeling and weather forecasts.</p> <p>CO4 Recognize the correspondence between climate and the human activities.</p> <p>CO5 To understand the magnitude of climate change, international climate change legal policy framework and the key issues under negotiation.</p>

ELECTIVE COURSE - 1 (01)

Course Title and Code	MSGGY01E01	HYDROLOGY AND WATER RESOURCE MANAGEMENT			
Semester	Hours per week	Credit	Exam. Hours	Marks	
I	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • To appraise the significance of hydrology and to understand the complex water systems of the earth and to find solutions for water problems. • To know the water cycle and its relevance in the sustenance of water resources and to apply the water balance equation to various hydrological problems. • To analyse the nature of processes involved in surface and ground water systems. • To examine the impact of human activities on water resources and contributing to the water resource management of the area based on the analysis of hydrological data.
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Modules	Content	No. of hours
Module 1 Scope of hydrology	Water – The environmental, technological of societal complexities system concepts in Hydrology. Sustainable water management and sustainable water development goals (SDG6). Hydrological Cycle; systems concepts, lumped and distributed systems, deterministic and stochastic Systems Human impact on the hydrological cycle, Global Water Balance – water balance equation.	22
Module 2 Surface and ground water system	Surface Water Systems, Drainage Basin as Geohydrological unit, – Basin Hydrological Phenomena- stream flow, stream flow measurement rainfall runoff relationships, Hydrograph analysis - runoff analysis. Ground water - factors affecting groundwater- aquifers and their characteristics/classification, groundwater basins, springs Darcy's Law and elementary groundwater flow equation, ground water monitoring, groundwater resource estimation	18
Module 3 Contemporary Issues and Challenges:	Water use conflicts, water quality and major water pollutants (points and non-point source), water quality criteria for different uses; Flood and drought studies – flood frequency analysis, flood plain zoning, estimation of flood for different frequencies, flood forecasting, drought assessment and monitoring	15

Module 4 Water Management Practices	Concept and Practice of Water Management- Traditional Water Harvesting, Storing and Management practices in India. Approaches of Surface Water Management - Watershed based approaches, Rainwater Harvesting –Significance. Artificial groundwater recharge, Wetlands Management, Government of India and State Government Initiatives for Water Management	25
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Essential Readings

1. Abbas, B.M. 1982. The Ganges Water Dispute, Vikas Publishing House Pvt. Ltd., New Delhi.
2. Aggarwal, A. 1991. Floods, Floodplains and Environmental Myths, Centre for Science and Environment, New Delhi.
3. Andrew, D. W. and Trimble, S. 2004. Environmental Hydrology, 2nd Edition, Lewis Publishers, CRC Press.
4. Beek, E., Loucks, P.D. 2005. Water Resource Systems Planning and Management: An Introduction to Methods, Models and Applications, UNESCO, Paris.
5. Bhattacharya, S.K. 1988. Urban Domestic Water Supply in Developing Countries, CBS Publishers, CR Distributors, Delhi.
6. Chow, V.T., Maidment, D.R. and Mays, W.L. (1988) Applied Hydrology, McGraw-Hill International Editions, McGraw-Hill Book Company, New York.
7. Chow V.T (2017) - Handbook of Applied Hydrology, Tata McGraw Hill, New Delhi
8. Jain, S.K., Aggarwal, P.K. and Singh, V.P. 2007. Hydrology and Water Resources of India, Springer, The Netherlands.
9. Jaya Rami Reddy (2011) A Textbook of Hydrology, University Science Press
10. Joseph Holden (2013) Water Resources-An Integrated Approach, Routledge
11. Karanth, K.R. 1988. Groundwater: Exploration, Assessment and Development, Tata-McGraw Hill, New Delhi.
12. Mahajan G. 1989. Evaluation and Development of Groundwater, Ashish Publishing House, New Delhi.
13. Micklin, Philip, P. 1996. Man and the water cycle: Challenges for the 21st century, Geojournal, 39 (3): 285-298.
14. Mysooru R Yadupathu Putty (2013) Principles of Hydrology I.K. International, New Delhi, 2013
15. Pietro Laureano (2001) Water Conservation Techniques in Traditional Human Settlements, Copal Publishing House
16. Raghunath, H.M (1987) Groundwater, Wiley Eastern Ltd., New Delhi.
17. Raghunath H M, (2006) Hydrology Principles, Analysis and Design, New Age International
18. Subramanya, K. 2010. Engineering Hydrology, Tata McGraw Hill Education Pvt. Ltd. New Delhi.
19. Savindra Singh - Fundamentals of Hydrology, Pravalika Publishers Allahabad

20. Thornthwaite, C.W. and Mather, J.R. 1957. Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance, Drexel Institute of Technology, Centerton, New Jersey.
21. Todd, D.K. 1980. Groundwater Hydrology, John Wiley, New York.
22. Viessman, W and Lewis (1996) Introduction to Hydrology, Harper Collins College Publishers

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	CO1 Understand the fundamental concepts in Hydrology and to analyse the components of hydrological cycle
	CO2 Analyse the elements of surface as well as ground water hydrology
	CO3 Examine the dimensions of contemporary water crisis
	CO4 Acquire knowledge on challenges in hydrology water resource planning and management
CO5 Examines the prospects of Water Resource Management and Policy	

ELECTIVE COURSE - 1 (02)

Course Title and Code	MSGGY01E02	INTEGRATED WATERSHED MANAGEMENT AND PLANNING		
Semester	Hours per week	Credit	Exam. Hours	Marks
I	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To understand the various approaches towards Integrated Watershed Management and Planning • To evaluate various concepts, theories and models related to geographical perspective of watershed based planning • To assess the nature of IWM organizations in the context of contemporary hydro politics • To analyse the successful stories of IWM in India • Analyze critically the need and prospects of IWM in Kerala and issues related to watershed management in the State.
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Modules	Content	No. of hours
Module 1 Scope of Integrated Watershed Management;	Integrated Watershed Management – multidisciplinary approach; watershed as a natural phenomena- geographical perspective of watershed; integrated watershed management – environmental and socio-economic perspective; issues related to integrated watershed management ; watershed inventory-Integrated Watershed Development Plan; Application of geo-informatics.	22
Module 2 Nature and dimensions of IWM	IWM organizations – participatory and community based; watershed monitoring and evaluation; role of IWM conservation authorities; planning, policies and regulations; watershed development management and technology; watershed planning and employment generation; Tools for watershed protection; watershed ecological assessment; hydro politics - water and security; equity issues in watershed management	18
Module 3 Successful stories of IWM in India	India’s water economy; government of India’s initiatives for watershed management; perspective of planning commission; world bank policies; institutional and policy reforms; watershed management issues in India; water conflicts – Indus system, Brahmaputra system, Krishna system, Kaveri system, Narmada system; significance of IWM system in India; IWM and environment sustainability in India; IWM organizations in India - role and their limitations; Water Resource Information System of India	17

Module 4 IWM programmes in Kerala	Geographical appraisal of watersheds in Kerala; issues related to watershed management; Institutes for Watershed Development and Management in Kerala; Western Ghat Development Cell; Watershed Gramasabha; IWM based rural property in Kerala; Mapping water foot print in Kerala; Contemporary issues related to IWM system in Kerala; Case Studies.	23
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Essential Readings
<ol style="list-style-type: none"> 1. Debarry Paul A. 2004. <i>Watershed: Processes, Assessment and Management</i>, John Wiley & Sons, New Jersey. 2. Dhruva N.V.V., Sastry G. and Patnaik U.S. 1990. <i>Watershed Management</i>, Indian Council of Agricultural Research, New Delhi. 3. Tideman E.M. 1999. <i>Watershed Management–Guidelines for Indian Conditions</i>, Omega Scientific Publishers, New Delhi. 4. Iyer K. G. and Roy U.N., (ed.), 2005. <i>Watershed Management and Sustainable Development</i>, Kanishka Publishers, New Delhi. 5. Gregersen H.M, Folliott P.F and Brooks K.N. 1983. <i>Integrated Watershed Management: Connecting People to their Land and Water</i>, CAB International, London. 6. Randhir O. Timothy, 2007. <i>Watershed Management-Issues and Approaches</i>, IWA Publishing. 7. Singh V.P and Frevert D.K. (ed.), 2005. <i>Watershed Models</i>, CRC Press, Taylor and Francis. 8. Rahaman, M.M. and Varis, O. 2005. Integrated water resources management: evolution, prospects and future challenges, sustainability, <i>Sci. Pract. Policy</i>, 1, 15–21. 9. Morgan R.P. 2009. <i>Soil Erosion and Conservation</i>, John Wiley and Sons.

Course Learning Outcomes	<p style="text-align: center;"><i>On completion of the course learner should be able to</i></p> <p>CO1 Understand the scope of Integrated Watershed Management and Planning in todays world</p> <p>CO2 Evaluate various concepts, theories and models related to geographical perspective of watershed and critically assess their suitability in present scenario.</p> <p>CO3 Assess the nature and role of IWM organizations in the context of hydropolitics</p> <p>CO4 Examines India’s role in world’s hydropolitics and to analyse the successful stories of IWM in India</p> <p>CO5 Analyze the need and prospects of IWM in Kerala and issues related to watershed management in the State.</p>
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ELECTIVE COURSE - 1 (03)

Course Title and Code	MSGGY01E03	GEOGRAPHY OF TOURISM		
Semester	Hours per week	Credit	Exam. Hours	Marks
I	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To understand geographical factors driving tourism industry • To analyse the cultural, economic, social and environmental impacts of tourism industry • To examine the recent trends in tourism industry and changing paradigms • To model and plan the sustainable development of tourism industry according to the potentials of locations.
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Modules	Content	No. of hours
Module 1 Geography of tourism	Tourism – Concept, nature, scope, and importance; Components of tourism – approaches to the study of tourism - Significance of tourism in social, cultural and economic realms; Role of Geography in tourism, International Geographical Union Commission on Tourism, Leisure and Global change	22
Module 2 Growth of tourism	Factors influencing the growth of tourism – Infrastructure and support systems. Concepts of mobility and spatialities in tourism, tourism fluxes, Cultural geography of tourism and leisure, Gender differences in Leisure. Place marketing and place formation- Spatial tradition of mobility, Time space geography, Tourism Area Life Cycle.	18
Module 3 Types and effects of tourism	Types of Tourism -Eco-tourism, Green tourism, Heritage tourism, Adventure tourism, Monsoon tourism, Niche tourism and Medical tourism, Participation and community based tourism, Responsible tourism, rural tourism and urban tourism – Social, cultural and Economic significance of tourism, Multiplier effect on the economy - Impact of tourism on environment, carrying capacity and tourism development, - Climate change and tourism.	20

<p>Module 4 Tourism in the World-changing paradigms</p>	<p>Global tourism flows – Distance decay and power curves, spatial dimensions of tourism attractions at national and international level. Major natural and cultural attractions in India with special reference to Kerala; Growth and development of tourism in spatio-temporal context. Problems and prospects of Tourism in India. Tourist Research Paradigms, Tourism-energy model, Tourism planning – Application of Geospatial Technology in tourism planning and modelling – Case studies; National Tourism Policy</p>	<p>20</p>
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Essential Readings

1. Beeton, S. (2006) *Community Development through Tourism*, Landlinks Press
2. Bhatia A K (1991) *International Tourism – Fundamental and Practices*, Sterling, New Delhi.
3. Bhatia A K (1996), *Tourism Development, Principles and Practices*, Sterling Publishers, New Delhi.
4. Buckley, R. (2009): *Ecotourism: Principles and Practices*, CABI
5. Butler, Richard. (2004) “Geographical Research on Tourism, Recreation, and Leisure: Origins, Eras, and Directions.” *Tourism Geographies* 6.2 : 143–162.
6. Chandra R H (2007) *Hill Tourism: Planning and Development*, Kanishka Publishers
7. Clare A Gunn (2002) *Tourism Planning – Basics, concepts, Cases*, Routledge, London.
8. Holden Andrew, 2000, *Environment and Tourism*, Routledge, London
9. Hunter C and Green H, 1995, *Tourism and the Environment: A Sustainable Relationship* Routledge, London,
10. Milton D, (1993) *Geography of World Tourism*, Prentice Hall, Newyork
11. Mustafa Mohammadi, Zainab Khalifah (2010), *Local People Perception Towards Social, Economic, Environmental Impacts of Tourism*, Asian Social Science, Volume No. 6, No.121,
12. Kennell, J., 2016. *Carrying capacity*. In *Encyclopedia of Tourism* (pp. 133-135). Springer International Publishing
13. Pearce D G, (1995) *Tourism today: A Geographical analysis*, Longman
14. Rohit Balyani (2012) *Eco-Tourism and Sustainable Development in India*, Swarup Publishers, New Delhi.
15. Sandeep Bhardwaj (2012) *Handbook of Tourism Geographies*, Arise Publishers, New Delhi.
16. Shaw G and Williams A M, *Critical issues in Tourism-A Geographical perspective*
17. Shiji O, 2017, *Urban tourism- The case of India*, International Journal of Advanced Education and Research, Volume No 2,
18. Stephen Williams, 1998, *Tourism Geography*, Routledge, London,
19. Suresh, K.T. (1994): *Tourism Policy of India: An Exploratory Study*, Equations, Bangalore

20. Swarbrook J (2010), *Sustainable Tourism Management*, Rawat Publications, Jaipur.
21. Verka Jovanović and Angelina Njeguš: *The Application of GIS and its components in Tourism*, *Yugoslav Journal of Operations Research*, Vol 18 (2008),

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Critique the significance of tourism as a human expression in spatial context.</p> <p>CO2 Evaluate the significance of tourism in the cultural, social, economic and environmental milieu of geographic spaces.</p> <p>CO3 Analyse various types of tourism and their geo-backup</p> <p>CO4 Examine the spatial dimensions of tourism attractions at national and international level</p> <p>CO5 Evaluation of emerging tourist research paradigms and tourism planning</p>

ELECTIVE COURSE - 1 (04)

Course Title and Code	MSGGY01E04	GEOGRAPHY OF HEALTH		
Semester	Hours per week	Credit	Exam. Hours	Marks
I	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To outline the developing role of geography in the theoretical and practice based issues in the area of health and health care • To explain the dimensions of geographical determinants of health in a region. • To engage students in multidisciplinary perspectives on people's health issue at different geographical scales. • To analyse the spatial pattern of availability of health resources and its inequalities
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Modules	Content	No. of hours
Module 1 Growth and development of Geography of Health.	Approaches in Geography of Health; ecological, social and spatial perspective- Human-Environment Interaction: Health and environment-concept of health, geographical approaches of health, Geography of health and illness, natural environment and health- inorganic and organic, social environment and health. Global environmental change and health, air quality; contamination of food and water; climate change, temperature extreme, natural hazards.	20
Module 2 Modernization, population change and health	Disease classification genetic, communicable, non-communicable, occupational, deficiency diseases, WHO classification of diseases. Diseases diffusion: Meaning, factors/barriers, phases, types of diffusion. Epidemiology and geography, Epidemiological transition-The theory of epidemiological transition (Omran theory) factors of transition	18
Module 3 Emerging Health challenges	Urban Health and well being; Gender equity in health; migration and health; unhealthy life styles and diseases; ageing and health, adolescent/youth an health; Geography of urban versus rural health in India	17
Module 4 Global Inequalities in Health resources	Concept of health care, levels of health care, social context of disease, health care accessibility and utilization, health care system worldwide; Structure and evolution of health care system in India from ancient period, health care services in India, health care policy in India.	25

Essential Readings

1. Anthamatten, P. and Hazen, H. 2011. An introduction to the Geography of Health, Routledge, New York.
2. Amstrong R W (1971): Medical Geography and its Geologic Subtract, The Geological Society of America
3. Braveman, P., Egerter, S., Williams, D.R. 2011. The Social determinants of health: coming of age, Annual Review of Public Health, 32:381-398.
4. Curtis, S. 2004. Health and Inequality: Geographical Perspectives, Sage Publications, London.
5. Freudenberg, N., Klitzman, S., and Saegert, S. (eds.) 2009. Urban Health and Society: Interdisciplinary Approaches to Health and Practice, San Francisco, CA: Jossey-Bass.
6. Gaimard, M. 2014. Population and Health in Developing Countries, Springer, New York.
7. Gatrell, A.C. and Elliott, S.J. 2015. Geographies of Health: An Introduction. 3rd edition, Wiley- Blackwell, Oxford.
8. Gatrell A C & T C Bailuy (1996): Interactive Spatial analysis in medical Geography, Social Science and Medicine, 42(6)
9. Husain Majid (1994): 'Medical Geography', Anmol Publication Pvt.Ltd. New Delhi
10. Learmonth A T A (1978): 'Patterns of diseases and hunger', A Case study in Medical Geography, David and Charles, Victoria
11. Luginaah, I., and Kerr, R.B. (eds.) 2015. Geographies of Health and Development, Burlington, VT: Ashgate
12. May J M (1970): 'The World Atlas of Diseases' National Book Trust, New Delhi
13. Mc. Glashan N.D (1972): 'Medical Geography, Methuen, London
14. Meade M. S and R.J. Erickson (2005), Medical Geography, Guilford press.
15. Misra R P (1970): 'Medical Geography' National Book Trust, New Delhi
16. Misra, R.P. 2007. Geography of Health: A Treatise on Geography of Life and Health in India, Concept Publishing Company, New Delhi.
17. Rais A S Learmonth A T A (1990): 'Geographical aspects of health and diseases in India' Rawat Publication, Jaipur
18. Sen, G., and Ostlin, P. (eds.) 2010. Gender Equity in Health: The Shifting Frontiers of Evidence and Action, Routledge, New York.
19. Rais A S Learmonth A T A (1990): 'Geographical aspects of health and diseases in India' Rawat Publication, Jaipur
20. Stamp L. D.(1964): 'Some aspects of Medical Geography', Oxford University Press Oxford

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	C01 Understanding basic concepts and issues of health geography; Conceptualise and critically examines the changing approaches of health geography
	C02 Examining the geography of health and illness
	C03 Understanding health inequalities and analyses epidemiological transition
	C04 Establish linkages between health and global environmental changes
	C05 Critically examines global Inequalities in health resources; Emerging health issues and challenges

CORE COURSE - 4

Course Title and Code	MSGGY01C04	PRACTICAL I – INTERPRETING PHYSICAL GEOGRAPHY		
Semester	Hours per week	Credit	Exam. Hours	Marks
I	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> To acquire understanding and hands own training in advanced techniques in geomorphometric analyses Provide insight and practice to analyse climatic data and interpret various weather systems. To familiarize the students with the techniques in geography for the analysis of the elements constituting the physical environment and to apply the knowledge in practice.
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Modules	Content	No. of hours
Module 1 Geomorphometric analysis	<p>Slope analysis- Gradient and slopes – profiles- Drawing of serial, Superimposed, composite, and projected profiles. Calculation of average slopes- Smith, Robinson and Went Worth. Trend surface analysis- Hypsometric and clinographic curve.</p> <p>Morphometric analysis Longitudinal profile of a stream.– Identification of watersheds – Calculation of area, stream ordering and its significance – Stream length ratio, Bifurcation ratio, Stream density, Elongation ratio, Circularity ratio.</p>	22
Module 2 Interpreting landscapes	<p>Interpretation of geological maps, Estimation of soil loss using Universal Soil Loss Equation, Flood frequency analysis. Block diagrams – One point perspective & Two point perspective– Preparation of block diagrams from contour maps – Multi section method. Block diagrams representing erosional and depositional features produced by river, glacier, wind, underground water and waves.</p>	18
Module 3 Analysis of Climatic data	<p>Preparation of climatic maps and diagrams – representation of climatic data by Isopleths, Isotherms, Isobars, Isohytes, Equipluves, and Equi-Variable maps Columnar, Linear and Circular graphs – Frequency graphs – Trend graphs - Wind Rose diagrams – Climographs, Hythergraphs, Climatographs, Running mean, Adjusted profiles, Relative Temperature curve, Deviation graphs & Rainfall dispersion diagrams.</p>	15

Module 4 Interpreting atmospheric system and dynamics	Weather map interpretation - Preparation of station models --Concept of water balance – Calculation of water balance using Thornthwaite method – Index of Aridity – Determination of climatic types by using Thornthwaite method. Cyclonic track analysis.	25
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Essential Readings	
	<ol style="list-style-type: none"> 1. Ashish Sarkar (2009) Practical Geography – A systematic approach, Orient Black Swan, Kolkata. 2. Bangulia A M (2006) Practical Geography, Anmol Publishers Pvt. Ltd. 3. Chorley, R.J. (ed.) 1972. Spatial Analysis in Geomorphology, Harper and Row. 4. Doornkamp, J.C. and King, C.A.M. 1971. Numerical Analysis in Geomorphology: An Introduction, Arnold, London. 5. King, C. A. M. (1966): Techniques in Geomorphology, Edward Arnold Ltd., London 6. Lutgens, F. K. and Tarbuck, E. J. (2010): The Atmosphere: An Introduction to Meteorology, Pearson Prentice Hall, New Jersey 7. Mayer, L. 1990. Introduction to Quantitative Geomorphology, Prentice Hall, New Jersey. 8. Monkhouse F J & Wilkinson H R (1973), Maps and Diagrams, Methuen & Co. Ltd. London 9. Morisawa, M. 1983. Geomorphological Laboratory Manual, John Wiley & Sons, New York. 10. Navarra, J. G. (1979): Atmosphere, Weather and Climate, W. B. Saunders Company, Philadelphia 11. Pal, S.K. 1998. Statistics for Geoscientists: Techniques and Application, Concept Publication Company, New Delhi. 12. Singh L R (2009) Fundamentals of Practical Geography, Sharda Pustak Bhavan 13. 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 14. World Meteorological Organization (2008): Guide to Meteorological Instruments and Methods of Observation, WMO-No. 8 15. Zulfequar Ahmad Khan M D (1998) Text book of Practical Geography, Concept Publishing Company.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Practice techniques to calculate the average slope and gradients of the earth surface and interpret terrain</p> <p>CO2 Acquire technical skill in the analysis of the morphological aspects of drainage basin.</p> <p>CO3 Analysis of regional lithology, form and processes</p> <p>CO4 Application of various methods for the classification of climate</p> <p>CO5 Analyse and interpret hydro-meteorological data for better water resource management.</p>

SEMESTER II

CORE COURSE 5

Course Title and Code	MSGGY02C05	REGIONAL PLANNING AND DEVELOPMENT			
Semester	Hours per week	Credit	Exam. Hours	Marks	
II	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> To develop and apply new knowledge in the field of Regional planning and Development Equip students with thorough knowledge of the concepts, theories and issues in Regional Planning and Development Provide service to government, communities, and others concerned with urban and regional planning
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Modules	Content	No. of hours
Module 1 Concepts of regional planning	Region: Meaning, Types Characteristics and Hierarchy. Planning: Definition, Concept, Types and Characteristics. Regional Planning: Scope, objective, Principles, Methods, techniques, characteristics, significance, Types of Regional Planning, Delimitations of regions, Purposes of regional planning, Regional growth and development, Regional planning processes, Norms and Standards for Regional planning.	22
Module 2 Theories of Regional planning and Economic development	Economic Systems, Classical theory of economic development, Marxian theory of economic development, Schumpeter theory of economic development, Myrdal theories of circular causation, Leontief-input output model, Francis Perroux-Growth pole theory, Hirschman theory of Balanced and unbalanced growth, R.P. Misra Core Peripheral model and Growth Foci, Export Base Theory by Doughlass C North	18
Module 3 Development issues and Regional inequalities	Meaning and concept of modern economic growth, Indicators and measurement of development- sustainable development-theories of limits to Growth Model and beyond the limits, Millennium Development Goals and UN Agenda 21. Spatial pattern of regional imbalance, Vicious cycle of poverty-The dependency theory of underdevelopment- Human capital formation and manpower. Studies in regional imbalance-Bimaldas Gupta, Hemalatha Rao, Ashok Mehta and V.Nadh - Regional development strategies: Growth Center, Special Economic Zones, watershed approach, micro level planning.	17
		23

Module 4 Regional Planning in India	History of planning in India, Five year Plans and Niti Ayog, Economic development and Regional Imbalance in India-Micro and Multilevel planning, Rural and urban planning, Decentralized Planning, Government Planning Programmes in India, Watershed Based Planning,	
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Essential Readings

1. Chandna, R. C. (2000): Regional Planning: A Comprehensive Text. Kalyani Publishers., New Delhi.
2. Chaudhuri, J. R. (2001): An Introduction to Development and Regional Planning with special reference to India. Orient Longman, Hyderabad.
3. Cowen, M.P. and Shenton, R.W. (1996): Doctrines of Development, Routledge, London.
4. Doyle, T. and McEachern, D. (1998): Environment and Politics. Routledge, London.
5. Friedmann, J. (1992): Empowerment: The Politics of Alternative Development. Blackwell, Cambridge MA and Oxford.
6. Friedmann, J. and Alonso, W. (ed.) (1973): Regional Development and Planning. The MIT Press, Mass.
7. Hettne, B., Inotai, A. and Sunkel, O. (eds.) (1999 – 2000): Studies in the New Regionalism. Vol. I-V. Macmillan Press, London.
8. Isard, W. (1960): Methods of Regional Analysis. MIT Press, Cambridge, MA.
9. Kuklinski, A. R. (1972): Growth Poles and Growth Centres in Regional Planning. Mouton and Co., Paris.
10. Kuklinski, A.R. (ed.) (1975): Regional Development and Planning: International Perspective, Sijthoff-Leydor.
11. Leys, C. (1996): The Rise and Fall of Development Theory. Indian University Press, Bloomington, and James Curry, Oxford.
12. Mahapatra, A.C. and Pathak, C. R. (eds.) (2003): Economic liberalisation and Regional Disparities in India. Special Focus on the North Eastern Region. Star Publishing House, Shillong.
13. Mahesh Chand and Puri V K (2011), Regional Planning in India, Allied Publishers Private Limited, New Delhi.
14. Misra, R. P. (ed.) (1992): Regional Planning: Concepts, Techniques, Policies and Case Studies. 2nd edition. Concept Publishing Company., New Delhi.
15. Misra, R.P. and Natraj, V.K. (1978): Regional Planning and National Development. Vikas, New Delhi.
16. Nath, V. 2009. Regional Development and Planning in India, Concept Publishing Company.
17. Sundaram K V 1997, Decentralised Multi level Planning – Principles and Practice, Concept Publishing Company, New Delhi

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>C01 Explain major planning paradigms and their applications; and articulate processes leading to regional growth and development and provide rationales for planned interventions</p> <p>C02 Apply regional planning Concepts, Theories and Methods to organize, analyze, interpret and present information;</p> <p>C03 Analyse the meaning and concept of modern economic growth;</p> <p>C04 Examine various Development issues and dimensions of Regional inequalities;</p> <p>C05 Analyse the salient features of Indian planning</p>

Course Title and Code	MSGGY02C06	PRINCIPLES OF REMOTE SENSING			
Semester	Hours per week	Credit	Exam. Hours	Marks	
II	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> To create a basic knowledge on different types of remote sensing, basic principles of remote sensing To make the students aware about the advantages of the applications of remote sensing as a tool for monitoring objects & phenomena and suggesting their strategic management To apply the potentials of remote sensing technology in multidisciplinary research and to make suggestions for various problems
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Modules	Content	No. of hours
Module 1 Basic elements of Remote sensing process	Evolution and Developments in Remote sensing, basic principles of Remote Sensing; Electromagnetic Radiation – Energy Interactions- Atmospheric windows, Spectral reflectance of Earth's surface features, types of Sensors and platforms- Advances in Indian remote sensing-	17
Module 2 Types of sensors and platforms in remote sensing	Development of Aerial remote Sensing;-Basic Principles-Types of Aerial Photographs-Film-Filters-Aerial cameras, Concept of Photogrammetry – Definition-Geometry of Vertical Photographs, Flight Planning Mission; Overlapping concept – Stereoscopic Neat Model-B\H Ratio-Parallax-Scale of Vertical Photographs-Orthophotos. Principles of Satellite remote sensing- LANDSAT, SPOT, IRS, ERS, INSAT programmes and their characteristics. Platforms / Sensor properties-. Multispectral-Hyperspectral- Thermal and micro wave Remote Sensing Types of satellites and sensors-data products- Geometric Characteristics-	23
Module 3 Data Analysis:	Data Products and their Characteristics, Data Pre-processing – Basic Principles of Visual Interpretation, Ground Truth verification. Procedures in Digital Image Processing- Information Extraction; Image Classification-Supervised and Unsupervised Classification, Image Classifiers; Accuracy Assessment, Indices; NDVI-SAVI-NDWI-EVI	22

Module 4 Applications and Recent Trends	Application of RS in Agriculture-Forestry-Land use/Land cover, Environmental studies, Hydrology, Marine and Coastal studies, Urban and Regional Planning, Wildlife ecology, Archeology, Geology. Natural Resource Management. Recent Trends in Remote Sensing; LIDAR-Drone Mapping- Hyperspectral Remote Sensing	18
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Essential Readings
<ol style="list-style-type: none"> 1. James B Campbell and Randolph H W (2011) Introduction to Remote Sensing, Gulford Press, New York. 2. Charles Elach & Jakob van Zyl. (2006) Introduction to the physics and techniques of Remote Sensing, John Wiley & Sons publications. 3. Christian Matzler (2006) Thermal microwave radiation: Applications for remote sensing, The Institution of Engineering and Technology, London . 4. Jenson J R (2004) Remote sensing of the Environment, Pearson Education Pvt. Ltd, Delhi. 5. Lillesand T M, Kiefer R W and J W Chipman (2008) Remote sensing and Image Interpretation, John Wiley, New Delhi. 6. Panda B C (2005) Remote Sensing -Principles and Applications, Viva Books, New Delhi. 7. Rampall K K (1999) Handbook of Aerial Photography and Interpretation, Concept Publishing Co. New Delhi 8. Rees, W. G.(2001), Physical Principles of Remote Sensing, Cambridge University Press, 2001 9. Paul Curran P.J.(1985) Principles of Remote Sensing, ELBS Publications. 10. Sabins, F F (1987) Remote Sensing; Principles and Interpretation, W.H Freeman & Co. New York. 11. ASPRS; Subsequent edition (September 1, 1983) Manual of Remote Sensing. Volumes I & II. Second Edition

Course Learning Outcomes	<p style="text-align: center;"><i>On completion of the course learner should be able to</i></p> <p>CO1 Analyze the energy interactions in the atmosphere and earth surface features</p> <p>CO2 Select the type of remote sensing technique / data for the required purpose</p> <p>CO3 Develop theoretical knowledge about the skill of photogrammetry and identify the earth surface features from satellite images</p> <p>CO4 Examine various techniques in Digital Image Processing</p> <p>CO5 Develop a sound knowledge of the applications of remotely sensed data for monitoring and managing atmospheric and terrestrial features.</p>
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ELECTIVE COURSE - 2 (1)

Course Title and Code	MSGGY02E05	ENVIRONMENTAL GEOGRAPHY		
Semester	Hours per week	Credit	Exam. Hours	Marks
II	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To analyse the scope, significance and various approaches to environmental geography • To understand the structure of the ecosystem as well as the man – environment interrelationships • Examine the causes and consequences of Environmental deterioration • To develop positive attitude among the students for the protection and conservation of the environment with a sustainable perspective.
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Modules	Content	No. of hours
Module 1 Nature of Environmental Geography	Nature and scope of environmental geography. Man and environment relationship – changing nature of the concepts. Environmentalism Ecosystem – Structure, Classification, Biomes, Functioning of the Ecosystem, Food Web, Food Pyramid, Nutrient Cycle. Natural Disruptions of the Ecosystem. Biodiversity, Leopold Matrix, Ecological footprint, Desert and coastal ecosystems; integrated coastal zone management	18
Module 2 Environmental hazards	Environmental disasters and hazards; meaning, classification and types (natural and man induced hazards) causes, impact and remedial measures. Changes in patterns of land use; Population explosion and food security; Environmental degradation; Deforestation, desertification and soil erosion.	20
Module 3 Dimensions of Environmental degradation	Mans impact on land and water; Human settlements and environment – Urban environment and pollution Environmental degradation – Emerging environmental issues. Environment and Health – Environment and development	20
Module 4 Environmental management and planning	Eco-crisis – Environmental management and planning. Environmental quality. Environmental law and protection – National and International Laws - Environmental policies and programs, environmental education and legislation.	20

Essential Readings

1. Alexander, Mike. 2008. Management planning for nature conservation: A theoretical basis & practical guide, Springer.
2. Bhaskar C B (2006) Environmental Geography, GNOSIS Publishers, Delhi.
3. Balakrishnan, M., 1998 : Environmental Problems and Prospects in India, Oxford & IBH Pub., New Delhi.
4. Freedman, Bill. 1995. Environmental Ecology: The Ecological Effects of Pollution, Disturbance, and Other Stresses, Academic Press. London.
5. Gole, P., 2001. Nature Conservation and Sustainable Development in India, Rawat Pub., Jaipur.
6. Mohan Singh (2011) Environmental Geography, A B D Publishers, New Delhi.
7. Odum E P (1959) Fundamentals of Ecology, Saunders
8. Munn R E (1979) Environmental Impact Assessment: Principles and Procedures, John Wiley & Sons
9. Nobel & Wright (1996): Environmental Science, Prentice Hall, New York
10. Savindra Singh (2008) Environmental Geography, Prayag Pusthak Bhavan, Allahabad.
11. Saxena H M (2004) Environmental Geography, Rawat Publication, New Delhi.
12. Singh, R.B. (ed.) (1989): Environmental Geography, Heritage, New Delhi
13. Viswambhar P S (2012) An Introduction to Environment, Rawat Publication, New Delhi.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	CO1 Understanding the dimensions of man nature interrelationship
	CO2 Discussing the elements of ecosystems and types of ecosystems constituting the environment
	CO3 Examine the dimensions of environmental disasters and hazards
	CO4 Knowledge of anthropogenic interventions and impacts, conservation strategies and planning.
	CO5 Evaluation and achievement of different environmental programs, policies and legislations

ELECTIVE COURSE - 2 (2)

Course Title and Code	MSGGY02E06	MODERN ECONOMIC GEOGRAPHY		
Semester	Hours per week	Credit	Exam. Hours	Marks
II	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To understand the importance of economic geography in analysing contemporary societies and economies • To provide a comprehensive introduction to basic concepts and key theoretical approaches in economic geography • To examine the need and scope of the concept of sustainable development • To understand the key social and economic issues in the context of globalization and to ponder over the options for overcoming inequalities and uneven development over the world.
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Modules	Content	No. of hours
Module 1 Approaches to economic geography	Scope and content of economic geography, Conservation and management of resources. Introduction to spatial economics; issues in spatial economic system; links with economic and geographic factors, economic gravitation, Evolution of economic systems and sectors- Key approaches in economic geography (neo-classical-inspired, location theory, Marxist-inspired approaches, evolutionary and institutionalist inspired approaches, new economic geography, alternative views).	22
Module 2 Key concepts and theories in economic geography	Key concepts and theories: wealth, value and circuits of capital, factors of production; agriculture, manufacturing and services; neo-classical equilibrium; central place theory, urban hierarchy, market potential; connectivity-accessibility; increasing returns and cumulative causation; uneven development; core-periphery theories of economic change; agglomeration economies; divisions of labour (social, technical, spatial); cycle theories, waves of development; technical change, innovation; regional innovation systems and clusters; knowledge and learning economies; networks, trust and social capital; cultural economies, ethnicity and gender.	18
Module 3 Geography of world economy	World capitalist and socialistic economy; Development through co-operation; European Union, Central American Common Market, South Asian Association of Regional Co-operation, Globalization and its impact on Economy, Economic groupings. Emerging Economic regions, SEZ and IT hubs. Effects of Liberalization, Privatization and Globalization (LPG) on Economic activities in the World and India,	17
Module 4	Concept of sustainable development- Approaches to eliminate	23

Sustainable development	inequalities in the global development; sustainable development goals (Goal 17: global partnership for sustainable development).	
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Essential Readings

1. Anderson William P. 2012. *Economic Geography*, Routledge, London.
2. Clark, G.L., M.P. Feldman and M.S. Gertler (eds) *The Oxford Handbook of Economic Geography*. (Oxford University Press, 2003)
3. Coe N. M., Kelly P. F. and Yeung H. W. C. 2007. *Economic Geography: A Contemporary Introduction*, Blackwell, Oxford.
4. Dicken P. 1990. *Global Shift: Mapping the Changing Contours of the World Economy*, Harper Collins Publishers, New York.
5. Fujita Masahisa, Krugman Paul and Venables Anthony, 2001. *The Spatial Economy: Cities, Regions and International Trade*, The MIT Press.
6. Guha J.L. and Chattoraj (2004), *A New approach to Economic Geography, A study of resources*, the world Press Pvt. Ltd. Calcutta.
7. Hanink D. M. 1997. *Principles and Applications of Economic Geography*, John Wiley, New York.
8. Jovanovich M. 1998. *International Economic Integration: Limits and Prospects*, Routledge.
9. Knox Paul, Agnew John, McCarthy Linda, 2008. *The Geography of the World Economy*, OUP, USA.
10. Lee R. and Wills J. (eds.), 1997. *Geography of Economics*, Arnold, New York.
11. MacKinnon D. and Cumbers A. 2007. *An Introduction to Economic Geography: Globalization, Uneven Development and Place*, Pearson/Prentice Hall, Harlow.
12. Murray Warwick E. 2006. *Geographies of Globalization*. Routledge.
13. Prager Jean-Claus and Thisse Jacques-Francois, 2012. *Economic Geography and the Unequal Development of Regions*, Routledge, London.
14. Sheppard, E. and T.J. Barnes (eds) *A Companion to Economic Geography*.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>	
	CO1	Examines the significance of economic geography in analysing the ways societies and economies work
	CO2	Understand key concepts and theoretical approaches in economic geography
	CO3	To apply the concepts and theoretical approaches in economic geography to the key social and economic issues in the context of globalisation
	CO4	Understand the ways to overcome inequalities and uneven development in the globalizing world.
	CO5	Develop competencies to suggest methods for the sustainable development of the World economy

ELECTIVE COURSE - 2 (3)

Course Title and Code	MSGGY02E07	GEOGRAPHY OF SETTLEMENTS			
Semester	Hours per week	Credit	Exam. Hours	Marks	
II	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> To understand the scope and significance of settlement geography Acquaint with the spatial and structural characteristics of human settlements under varied environmental conditions To examine the salient features of types and pattern of various settlements To analyse the need and significance of settlement planning
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Modules	Content	No. of hours
Module 1 Scope and content of Settlement geography	Nature, Scope and Approaches to Study of Settlement Geography; Recent Trends in Settlement Geography. Evolution of Settlements in the World and in India: Emergence of Village Settlements; rural settlement patterns, Origin and Growth of Towns; Basic and Non-Basic Concepts in Settlement formation.	22
Module 2 Spatial pattern of settlements	Factors influencing the growth and distribution of settlements – physical, social and economic factors; changes in shelter and pattern of settlements- patterns of settlements, effects of technology on shelter and pattern from Neolithic to modern periods; Factors influencing the dispersion and nucleation of settlements. Distribution of Settlements, Spacing of Settlements -Application of Models of Christaller and Losch .	18
Module 3 Rural Settlements	Types & patterns of Rural Settlements, House Types, Morphology and Functions of Rural Settlements; Rural Service Centers and their Role in Urbanization Process. Indian Rural Settlements in Different Micro-Environmental Conditions: (a) Mountains (b) Desert Region (c) In the vicinity of Urban Centers	15
Module 4 Urban settlements	Growth of Towns and Cities –trends of urbanization in the world- the urban processes in India; Colonial legacy, the post-independence- sphere of urban influence, Classification of Urban Places, Morphology of Indian Cities and Its Comparison with Western Cities; Functional relations in urban systems; primate city, rank-size rule, settlement hierarchy. Changing Morphology and Segregation of Rural and Urban settlements; Problems and Prospects of Settlements; Role of RS and GIS in Rural and Urban Settlement Planning- case study	25

Essential Readings

1. Alam, M. and Gopi, K. N. (1982): Settlement System of India, Oxford and IBH Publication, New Delhi
2. Ambrose, Petir, Concepts in Geography, Vol., I, Settlement Pattern, Longman, 1970.
3. Baskin, C., (Translator), Central Places in Southern Germany, Prentice Hall Inc. Englewood
4. Cliffs, New Jersey, 1966. Originally written by C.W. Christaller in German with title Die Zentralen Orte Suddeutsch Land in 1933.
5. Bose, A. (1980): India's Urbanisation, Tata McGraw Hill, New Delhi
6. Carter, H. (1979): The Study of Urban Geography, Arnold Heinemann, London
7. Hagget, Peter, Andrew D. Cliff and Allen Frey (edited), Location Models , Arnold Heinemann, 1979.
8. Hall, T. (2006): Urban Geography, Routledge, London
9. Hudson, F. S. (1976) Geography of Settlements, Macdonald, London
10. King, Leslie, J.(1986), Central Place Theory, Sage Pub., New Delhi.
11. Mayer, M. Harold and Clyde F. Kohn (editors), Reading in Urban Geography, Central Book Depot, Allahabad, 1967.
12. Mitra, Ashok, Mukherjee, S and Bose R., Indian Cities, Abhinav Pub., New Delhi.
13. Northam Ray, M. (1979). Urban Geography, John Wiley and Sons, New York.
14. Pacione, M. (2009): Urban Geography, Routledge, New York
15. Ramachandran, R.,(1992) Urbanization and Urban Systems in India, Oxford University Press, New Delhi..
16. Singh, R.L. and Kashi Nath Singh (editors), Readings in Rural Settlement Geography,
17. National Geographical Society of India, Varanasi, 1975. Syllabus 2017-2
18. Singh, R.Y. (1994): Geography of Settlements, Rawat Publications, Jaipur

<i>On completion of the course learner should be able to</i>	
Course Learning Outcomes	CO1 Understand the approaches for the analysis of geography of settlements.
	CO2 To trace the evolution and development of settlements in the world
	CO3 To familiarize with the theories and models in settlement geography
	CO4 Assess Indian urban settlement patterns and their morphological structure and trace out current issues related to urban development in India.
	CO5 To understand the changing morphology and segregation of rural and urban settlements and to understand urban development planning and importance of geographical concepts in contributing to settlement policies

Course Title and Code	MSGGY02E08	ADVANCED GEOGRAPHY OF INDIA		
Semester	Hours per week	Credit	Exam. Hours	Marks
II	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • Enable students to broaden and deepen their understanding of India's geographical setting • Understand how the geo-physical setting is contributing to our "Unity in diversity". • Acquire knowledge on the dynamism of human geographical dimensions in the country • Examine the geo-politics of the country and its relations with other nations
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Modules	Content	No. of hours
Module 1 India- bio-physical setting	India- a spatial entity; Landforms and landscapes of India – distribution, characteristics, geological and hydrological influences on its evolution; climatic phenomena and its manifestations in India, Climate and climate change – its impact on Agriculture, Water, Natural Ecosystems & Biodiversity and Health sectors and in the Himalayan region, the Western Ghats, the Coastal Area and the North-East Region.	20
Module 2 Socio-Economic landscape of India-	Peopling India - demographic setting- ethnic and religious composition, Spatial distribution of SC & ST population, and Minorities Spatial Pattern of Multi-culturalism and Economic Dynamism; ; migration of population –Displacement, Indian Diaspora and trade Peopling and Socio-Economic landscape of India- types, characteristics, human interactions, challenges, opportunities and impacts, economic regions, role of markets, significance of trade and transport.	23
Module 3 Problems of Nation Building	Religious conflicts: Linguistic conflicts, insurgency and separatist movements as failure to federalize, environmental movements and issues of rehabilitation and livelihoods, River water disputes, Vitality, Spatial Pattern of Poverty, Hunger, and Disability.	17
Module 4 Geography of International Relations:	ASEAN and SAARC as regional power blocs and India's position within them, India's bilateral relations with SAARC nations; Geopolitics of the Indian Ocean and India's position in the region; Between two worlds India's position in world politics.	20

Essential Readings

1. Arunachalam P (2014) Geography of India: Physical, Political and Commercial, Swastik Publications, New Delhi
2. Deshpande, C. B.(1992) India a Regional Interpretation. New Delhi: Northern Book Center
3. Drèze, Jean and Amartya Sen. (1996). India: Development and Participation. Oxford University Press
4. Gopal Singh (2005), Geography of India, Atma Ram and Sons, Delhi.
5. Jayaram, N. 2004. The Indian Diaspora: Dynamics of Migration. Sage Publications
6. Kapila Uma (2007), Indian Economy: Issues in Development and Planning and Sectoral Aspects, Academic Foundation, New Delhi.
7. Kapur, Anu. (2010). Vulnerable India: A Geographical Study of Disasters. Sage Publications
8. Kapur, Anu. (2015). Made Only in India: Goods with Geographical Indications. Routledge.
9. Kapur, Anu. (2002). Indian Geography: Voice of Concern, Concept Publishing Co.
10. Khullar, D.R. (2008). India: A Comparative Geography, Kalyani Publishers, New Delhi.
11. Krishan, Gopal. (2017). The Vitality of India: A Regional Perspective, Rawat Publications.
12. McKinsey & Company Inc. (2013). Reimagining India: Unlocking the Potential of Asia's Next Superpower. Simon & Schuster.
13. Nanda H (2014), Indian Stratigraphy, Anmol Publications Pvt.ltd, New Delhi.
14. Pranay Lal (2016) Indica-A Deep Natural History of the Indian Subcontinent, Penguin Allen Lane
15. Ram Ahuja (2005), Society in India- Concepts, Theories and Recent Trends, Rawat Publications, Jaipur.
16. Raza, M. and Ahmed, A. (1990) An Atlas of Tribal India, Concept Publishing Co, Delhi.
17. Siddhartha K and S Mukherjee (2004), Indian Industry - A Geographical Perspective, Kisalaya Publication Pvt. Ltd, Delhi.
18. Singh, Jagdish, (2003). India: A Comprehensive Geography, Radha Publications, Gorakhpur.
19. Singh K S (2003), People of India- Introduction, Oxford University Press, New Delhi.
20. Shukla, Sandhya. (2003). India Abroad. Hyderabad: Orient Longman

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>	
	CO1	Analyse the influence of physical setting on its climate, soil, vegetation and economic activities
	CO2	Examines the economic landscape of India
	CO3	Analyse the salient features of peopling India
	CO4	Critically examines various internal conflicts and problems of nation building
	CO5	Analyses the geopolitics of International Relations in Indian context

ELECTIVE COURSE - 3 (2)

Course Title and Code	MSGGY02E09	ENVIRONMENTAL IMPACT ASSESSMENT		
Semester	Hours per week	Credit	Exam. Hours	Marks
II	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To understand the significance of Environmental Impact Assessment (EIA) and its conceptual basis • To analyse the methodology of EIA and key issues involved in it. • To acquire knowledge about procedures and policies related to EIA based on national and international standards for practicing EIA. • Critically evaluate various EIA projects from a geographical stand point
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Modules	Content	No. of hours
Module 1 EIA conceptual basis	Environmental Impact Assessment: The Need for EIA, The EIA Cycle and Procedures, Decision Making, Monitoring the Clearance Conditions, Components of EIA, Roles in the EIA Process. Government of India Ministry of Environment and Forest Notification (2000), Environmental Impact Assessment regulations and policies in India; List of projects requiring Environmental clearance, Application form, Composition of Expert Committee, Ecological sensitive places. International agreements.	22
Module 2 EIA procedures	Environmental Impact Assessment: Stages, Screening and scoping, baseline data, Impact identification, Impact prediction, evaluation and mitigation, criteria and standards for assessing significant impact, cost-benefit analysis and valuation of environmental impacts, public participation, presentation and review and preparation of environmental Impact mitigating action plan.	20
Module 3 EIA- Key Issues	Identifying the Key Issues: Key Elements of an Initial Project Description and Scoping, Project Location(s), Land Use Impacts, Consideration of Alternatives, Process selection; Construction Phase, Input Requirements, Wastes and Emissions, Air Emissions, Liquid Effluents, Solid Wastes, Risks to Environment and Human, Health, Socio-Economic Impacts, Ecological Impacts, Global Environmental Issues	17
Module 4 EIA – Methodologies and case studies	Criteria for the selection of EIA methodology, impact identification, impact measurement, impact interpretation & Evaluation, impact communication, Methods-Adhoc methods, Checklists methods, Matrices methods, Networks methods, Overlays methods, Environmental index using factor analysis, Cost/benefit analysis, Predictive or Simulation methods. Rapid	21

	assessment of Pollution sources method, predictive models for impact assessment, Applications for RS and GIS Case Studies of Environmental Impact Assessment: Water Impact Assessment; Hydro-electric power Impact Assessment; Ecological Impact Assessment; Social Impact Assessment; Mining Impact Assessment; EIA case studies from Kerala	
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Essential Readings	
1.	Anjaneyulu.Y and Manickam. V. .(2007), Environmental Impact Assessment Methodologies, B.S.Publications, Hyderabad.
2.	Betty Bowers Marriott (1997): Environmental Impact Assessment, Mc Graw Hill Professional Bookstore.
3.	David P. Lawrence (2003) Environmental Impact Assessment: Practical Solutions to Recurrent Problems, John Wiley & Sons.
4.	Goel ,R.S. (2000) : Environmental Impacts Assessment of Water Resources Projects –Concerns, Policy Issues Perceptions and Scientific Analysis, Oxford Publishing Co. Pvt. Ltd.
5.	Goel R.S. and R.N.Srivastava, (1999): Hydropower and River valley Development – Environment Management, Case Studies and Policy Issues. Oxford & IBH Publishing Co. Pvt., New Delhi.
6.	Goudie,A., (2000) : The Human Impact on the Natural Environment, Blackwell, Publishers, Oxford.
7.	Hosetti B.B & Kumar Eds A. (1998), Environmental Impact Assessment and Management, Daya Publishing House, 1998.
8.	J. Glasson, R. Therivel and A. Chadwick (1994): Introduction to Environmental Impact Assessment: Principles and Procedures, Process, Practice and Prospects, Research Press, Delhi.
9.	Judith, Petts (eds.) (1999) Handbook of Environmental Impact Assessment, Blackwell Science Publication.
10.	Prasad, K. and Goel, R. S., (2000) : Environmental Management in Hydro Electric Projects, Concept Pub., New Delhi.
11.	Richard, K. Morgan (1999): Environmental Impact Assessment: A Methodological Perspective, Springer.
12.	Sinclair, J., (2000) : Canadian Environmental Assessment in Transition, University of Waterloo Press, Waterloo.
13.	Smith, L.G., (1993) : Impact Assessment and Sustainable Resource Management, Longman,
14.	UNESCO, (1987) Methodological Guidelines for the Integrated Environmental Evaluation of Water Resources Development, UNESCO/UNEP, Paris.
15.	Wathern.P. (2004) Environmental Impact Assessment- Theory and Practice, Routledge Publishers, London, 2004

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Understand the conceptual basis of Environmental Impact Assessment (EIA)</p> <p>CO2 Identify the steps and methodology to prepare EIA reports</p> <p>CO3 Familiarise with Key issues in EIA</p> <p>CO4 Analysis modern techniques in EIA</p> <p>CO5 Critical analysis of EIA in various dimensions through case studies</p>

ELECTIVE COURSE - 3 (3)

Course Title and Code	MSGGY02E10	SOCIAL IMPACT ASSESSMENT			
Semester	Hours per week	Credit	Exam. Hours	Marks	
II	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> To create awareness about the concepts and principles of Social Impact Assessment and to appreciate the benefits of adaptive management and engagement with stakeholders, as compared to point-in-time assessment. To engage in Social Impact Assessment and to identify the social impacts of developmental projects and to suggest management strategies.
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Modules	Content	No. of hours
Module 1 Fundamentals of Social Impact Assessment	Concept; scope and need: goals, evolution; typology; Displacement and Resettlement Planning : Relocation, resettlement and involuntary migration; resettlement area development planning; project management; resettlement monitoring and evaluation; development of Management Information System (MIS) for resettlement. Regional Dimension of hazard: Occurrence and trends, methods of identifying hazard prone regions.	22
Module 2 Techniques and Methods of SIA	Delphi technique, Cost-benefit analysis, Checklist methods, matrix method, linear graphs and network analysis, GIS, Expert system	18
Module 3 SIA Process	Social Impact Assessment (SIA) : SIA process-screening, scoping, base-line and census surveys; identification and measurement of impacts; public consultation process; mitigation and avoidance of impacts; preparation of resettlement action plan	15
Module 4 Case Studies on SIA :	Road construction, dams, irrigation projects, new town development; industrial relocation; urban development projects; hazards and disasters, Social Impact Assessment and related policies and legislation in India	25

Essential Readings

1. Asian Development Bank,(1991) : Guidelines for Social Analysis of Development Projects, Asian Development Bank, Manila.
2. Becker Henk (1997) : Social Impact Assessment: Method and experience in Europe, North America and the Developing World. UCL Press, London.
3. Blaikie P. et al. (1994) : Natural Hazards, People's Vulnerability and Disasters. Rutledge, London.
4. Cernea, M.M. (1988) : Involuntary Resettlement in Development Projects. World Bank Technical Paper 80. World Bank, Washington D.C.
5. Dreze Jean, Meera Samon and Satyajith Singh, (1997): The Dam and the Nation: Displacement and Resettlement in the Narmada Valley. Oxford University Press, New Delhi.
6. Graham S., (1994) Impact Assessment and Sustainable Resource Management. Longman, Harlow.
7. Hansen A. and Oliver-Smith A. (1982) : Involuntary Migration and Resettlement: The Problems and Responses of Displaced People, Westview, Colorado.
8. Horlick-Jones et al. (1995) Natural Risk and Civil Perception, Chapman and Hall, London.
9. Hough Michael. (1990):Out of Place; Restoring Identity to the Regional Landscape. Yale University Press, Princeton.
10. Kumar, K. (1993) Rapid Appraisal Methods. World Bank Regional and Sectoral Studies Series. World Bank, Washington D.C.
11. Thukral E. G., (1992) Big Dams, Displaced People: Rivers of Sorrow, Rivers of Change. Sage Publication , New Delhi.
12. Vanclay, F. and Bronstein, D.A., (1995) Environmental and Social Impact Assessment. Wiley, New York.
13. World Bank.(1995) Resettlement and Development: the Bankwide Review of Projects Involving Resettlement 1986-1993. World Bank, Washington D.C.
14. World Bank. (1994) Resettlement and Rehabilitation in India (2 Volumes) World Bank, Washington D.C.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Understand the nature, scope and approaches towards social impact assessment.</p> <p>CO2 Assess the factors leading to migration, de- settlement and resettlement of people in a region and to analyze its positive and negative impacts on geographical regions.</p> <p>CO3 Develop Management Information System for monitoring and evaluation of resettlement of people due to natural or manmade or political causes.</p> <p>CO4 Study cultural diversities at international, national, state and local level; highlight the major impacts of such cultural diversities in a region.</p> <p>CO5 Evaluate the social and cultural well-being of population in a region in order to assess its positive and negative impacts on the development of a region.</p>

CORE COURSE - 7

Course Title and Code	MSGGY02C07	PRACTICAL 2 : QUANTITATIVE TECHNIQUES FOR SPATIAL ANALYSIS		
Semester	Hours per week	Credit	Exam. Hours	Marks
II	10	4	3	100

Course Objectives	<ul style="list-style-type: none"> To understand the applications of quantitative techniques for spatial analysis Train and equip the students with advanced techniques of data analysis for geographical research and provide insight in various spatial analysis tools.
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Modules	Content	No. of hours
Module 1 Statistics application in Geography	Significance of Quantitative techniques in geography – Measures of Dispersion, indices of inequality and disparity, Probability Theory: Normal, Binomial and Poisson distributions and their application in geography. Normal curve - Measures of Skewness and Kurtosis, Correlation analysis – Simple and multiple correlation, Regression analysis – Residual mapping. Introduction to multivariate analysis. Mathematical methods and graphical methods - Lorenz curve, Triangular graph, Centographic analysis, Measurement of arrangements and dispersion.	22
Module 2 QT in geographical research	Hypothesis testing: Formulation, Rejection Rule, One and Two-Tailed Tests, Significance Level, Degrees of Freedom, Type I and Type II Errors; F-Distributions, analysis of variance, one-way and two-way classification Non-parametric Tests: Chi-Square, Kolmogorov-Smirnov, Mann-Whitney and Kruskal-Wallis. Statistical soft wares (R, SPSS)	18
Module 3 QT in agricultural studies:	Crop combinations and concentration techniques – Weaver’s, Doi, Coppock’s – Crop diversification – Index of Agricultural productivity	15
Module 4 QT in settlement studies:	Transportation network analysis – Measures of Accessibility, Connectivity and Efficiency. Centrality, Spread and Diameter of network, Detour index – Degree of development of network, diameter, Density and route shape of network - Nearest neighbor analysis, Gravity potential models. Representation of Population Statistics, Urban morphology, Nearest neighbor analysis, Demongeons co-efficient of dispersion, Simple index dispersion, Bernard’s index of concentration, Kant’s index of concentration, density of housing. Pattern Analysis: quadrant analysis, Entropy analysis, trend surface analysis; Flow Analysis Techniques.	25

Essential Readings

1. Alvi Zameer (2002) Statistical Geography -Methods and Applications, Rawat Publication, Jaipur.
2. Ashish Sarkar (2009) Practical Geography – A systematic approach, Orient Black Swan, Kolkata.
3. Bart James E. and Gerald M. Barber, 1996. Elementary Statistics for Geographers, The Guieford Press, London.
4. Briggs, W. 2016. Uncertainty: The soul of modeling, probability & statistics. Springer International Publishing. doi:10.1007/978-3-319-39756-6.
5. Bangulia A M (2006) Practical Geography, Anmol Publishers Pvt. Ltd.
6. Chorley, R.J. (ed.) 1972. Spatial Analysis in Geomorphology, Harper and Row.
7. Cressie, N.A.C. 1991. Statistics for Spatial Analysis, Wiley, New York.
8. Gregory, S. 1978. Statistical Methods and the Geographer (4th Edition), Longman, London.
9. Davis, John C. (2002). Statistics and Data Analysis in Geology (third edition), John Wiley Co
10. Hagget P, (1965) Locational Analysis in Human Geographical Studies, SAGE Publications
11. John Silk, (1979) Statistical Concepts in Geography, Harper Collins
12. Johnston R J (1980) Multivariate Statistical Analysis in Geography, Longman Higher Education
13. King T J, Statistical Analysis in Geography
14. McGrew, Jr. J.C. and Monroe, C.B. (2000). An Introduction to Statistical Problem Solving Geography (second edition), McGraw Hill, Boston.
15. Nussbaum, E. M. 2015. Categorical and Nonparametric Data Analysis: Choosing the Best Statistical Technique. New York: Taylor & Francis. doi:10.1007/978-3-319-39756-6
16. Rohatgi, V. K. and Saleh, A. K. 2015. An Introduction to Probability and Statistics, John Wiley & Sons, New Jersey.
17. Saroj K Pal (1998) Statistics for Geoscientists _ Techniques and Application, Concepts Publishing Company, New Delhi.
18. Saroj K Pal (2008) Computing mathematical Techniques in Geography, B R Publishing Corporation, New Delhi.
19. Tayler, P.J. 1977. Quantitative Methods in Geography: An Introduction to Spatial Analysis, Houghton Mifflin Company Boston, London.
20. Yeates, Mauris, 1974: An Introduction to Quantitative Analysis in Human Geography, Mc Grawhill, New York.

	<i>On completion of the course learner should be able to</i>
Course Learning Outcomes	CO1 Develop insights in various quantitative techniques in geography
	CO2 Analyze the advantages of various methods of testing Hypothesis
	CO3 Examines the role of QT in population and agricultural studies
	CO4 Analyses various scope of QT in population and urban studies:
	CO5 Examines the significance of QT in Transportation network analysis

SEMESTER III

CORE COURSE 8

Course Title and Code	MSGGY03C08	PRINCIPLES OF GEOGRAPHIC INFORMATION SYSTEM		
Semester	Hours per week	Credit	Exam. Hours	Marks
III	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To understand the basic concepts of Geographical Information System • To familiarize with the potentials of GIS for modeling the real world. • To understand various applications of GIS for the conservation and management of natural and material resource • To analyse the recent trends in GIS
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Modules	Content	No. of hours
Module 1 Fundamentals of GIS	Evolution of advanced cartography and GIS– components of GIS - Information Systems, Modeling Real World Features; Data Formats – Spatial and Non-spatial, Components, Data Collection and Input, Data Conversion, Database Management – Database Structures, Files; Standard Data Formats, Compression Techniques, Hardware – Computing, printing and scanning systems; Software – Standard Packages like Arc view, ArcGIS, Auto cad Map, Map Info etc.- Open source GIS	18
Module 2 Data in GIS	Representation of spatial and temporal relationships; geodetic datum- coordinate system- errors in representing geographic space- spatial and temporal relationship of spatial features, spatial data models – vector, raster, TIN , network data models. Layer concept of GIS. Data in GIS platform - spatial and attribute data, sources of GIS data –Errors in GIS data and its types; Data precision and data organization; Ethics of using GIS data metadata, Standards and significance, Data Catalogues – Indian standards, NSDI metadata standards, data model in GIS	22
Module 3 Analysis in GIS	Functions of GIS and Surface Modelling - functions of GIS – Data input and editing, organizing data in files and folders, Georeferencing Topological error correction -Spatial Analysis and Modeling – Proximity Analysis, Overlay Analysis, Buffer Analysis, Network Analysis, Spatial Auto Correlation, Gravity Modeling, DTM/DEM, Integration with Remote Sensing data	23
Module 4 Application of	Applications in LU/LCC, Urban planning, health care, Disaster management, defense, Transport planning, Agriculture, meteorology, marine studies, crime mapping, Tourism, natural	17

GIS and Latest trends	resource management, and planning social support systems. Recent trends in GIS- Web GIS and Web mapping: Geographic Markup Language - commercial web mapping programs.-Open Source GIS	
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Essential Readings

1. ArcGIS 10.1 Manuals, 2013.
2. Aronoff S,(1989) Geographic Information Systems: A Management Perspective, WDL Publications
3. Burrough, P.A. (2005), Principles of GIS for Land Resource Assessment, Oxford Publications, 2005
4. Chrisman N R (2001) Exploring Geographic Information System, Wiley
5. Fraser, Taylor D R (2013) Geographic Information Systems, Pergamon
6. John E. Harmon & Steven J. Anderson (2003) The design and implementation of Geographic Information Systems, John Wiley & Sons, .
7. Ian Heywood et.al (2002) An Introduction to Geographical Information System, Pearson Education Private Limited, Delhi.
8. Kraak, M. and Brown, A (2001) Web Cartography: Development and Prospects, Taylor and Francis, London.
9. Kang Tsung Chang (2008) Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.
10. Loo C P and Albert K W Y (2004) Concepts and Techniques of Geographic Information Systems, Prentice Hall of India, New Delhi.
11. Marble, D.F & Calkins, H.W.(1990) Basic Readings in Geographic Information System, Spad System Ltd.
12. Michael N DeMers (2005) Fundamentals of Geographic Information System, John Wiley and Sons, New Delhi.
13. Paul A Longley et.al (2001) Geographic Information System and Science, John Wiley and Sons, Chichester.
14. Star J and Estes (1989) Geographic Information Systems: An Introduction, Prentice Hall
15. Tereshenkov, A (2009). Web GIS Application in Local Government, VDM Verlag,
16. Thanappan Subash. (2011) Geographical Information System, Lambert Academic Publishing,

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Understand the basic components and functioning of GIS</p> <p>CO2 Understanding of various GIS analysis functions, representation of spatial and temporal relationships</p> <p>CO3 Examine the basic concepts of geographic data and its classification</p> <p>CO4 Equip the learner in analytical functions of GIS and Surface Modelling</p> <p>CO5 Understand the latest trends in GIS and evaluate the application potential of GIS in various fields.</p>

CORE COURSE 9

Course Title and Code	MSGGY03C09	URBAN GEOGRAPHY		
Semester	Hours per week	Credit	Exam. Hours	Marks
III	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To examine various approaches to study urban centres • To critically understand the complexities of urban cities and the experience of living in these cities. • To critically understand a broad range of issues that cities face today. • To provide a basic social, cultural, political and economic understanding of the urban areas • To analyse the salient features of urbanization in India
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Modules	Content	No. of hours
Module 1 Approaches to Urban studies	Nature and evolution of Urban Geography- approaches and trends – Environmentalism, Positivism, Structuralism, Post Colonialism and Post Modernism -Critical approaches to urban questions- Origin and growth of urban centres – Process of urbanization – factors of urban growth. Urban transformations – Early cities to industrial cities, colonial cities and post-colonial cities. World urbanization; trends, patterns; challenges in developing world.	22
Module 2 Urban system : hierarchy and morphology	Economic base- Urban function, interaction and classifications- Urban settlement system,- entropy of settlement systems, urban hierarchy, rank size rule, primate cities, Central places – Christaller and Losch models Morphology of cities – Models on structure and morphology of urban centres (Burges, Hoyt, Harris-Ullman, Mann, White), Urban Ecology, urban transport-urban planning – cities and climate change	18
Module 3 Socio-geographical dynamism in Urban system	Social organisation of the city, urbanism, emergence of urban cultures and sub-cultures, Urban Systems and the Regional Economy - production of urban elite and poor; Globalization and cities; Smart Cities; Gentrification and social exclusion in cities, Social area analysis. Urban slums and squatters, Urban - Urban-rural continuum, Urban problems, Urban crimes- heat island- environmental issues.	20
Module 4 Urbanization in India	Trends of urbanization in India – problems and prospects-urbanization in Kerala- Urban Governance – Definition, concepts, components, administrative structure – 74 th Constitutional Amendment Act; Urban Problems, Urban Renewal and Development Programmes in India.	20

Essential Readings

1. Andrew, E.G.J, McCann, E and Thomas, M 2015. *Urban Geography: A Critical Introduction*, Wiley, Blackwell, UK.
2. Bhattacharya, B. 2006. *Urban Development in India since Pre-Historic Times*, Concept Publishing Company, New Delhi.
3. Bridge, G Watson, S. (eds.) 2010. *The Blackwell City Reader* (2nd Edition), Wiley-Blackwell, UK.
4. Brunn, S.D., Hays-Mitchell, M., Ziegler, D.J. 2012. *Cities of the World: World Regional Urban Development* (5th edition), Rowman and Littlefield Publishers: England
5. Datta, A. and Shaban, A. (eds), 2017. *Mega-Urbanisation in Global South: Fast Cities and New Urban Utopias of the Post-colonial State*, Routledge: London and New York.
6. Friedmann, J. 1995. *Where we stand: A Decade of World City Research*, In: P. L. Knox and P. Taylor (eds) *World Cities in a World-system*. 21-47. Cambridge University Press, Cambridge:
7. Hall, T. 2002. *Urban Geography* (2nd Edition), Routledge: London and New York
8. Hardoy, J. E., Mitlin, D. Satterthwaite, D. 1992. *Environmental Problems in Third World Cities*, Earthscan, Great Britain.
9. Harold Carter (1995) *The Study of Urban Geography*, Arnold, London
10. James H Johnson, *Urban Geography-An Introductory Analysis*
11. Knox, P and Pinch, S. 2010. *Urban Social Geography* (6th edition), Pearson: England
12. LeGates T.R. and Stout F. (ed.) 2016. *The City Reader* (6th edition), Routledge: London and New York.
13. Majid Husain (2003) *Urban Geography*, Anmol Publications, New Delhi.
14. Mandal R B (2000) *Urban Geography*, Concepts Publishing Company, New Delhi.
15. Misra, R.P. (ed.) 2013. *Urbanization in South Asia: Focus on Mega Cities*, Cambridge University Press, New Delhi.
16. Nandy, A, 2001. *An Ambiguous Journey to the City: The Village and other Odd Ruins of the Self in the Indian Imagination*, New Delhi: OUP.
17. Ramachandran R (1992) *Urbanization and Urban Systems in India*, Oxford University Press, Delhi.
18. Roberts, P., Ravetz, J. and George, C. 2009. *Environment and the City*. Routledge, London
19. Sassen, S (ed.) 2002. *Global Network, Linked Cities*, New York: Routledge.
20. Scott, A.J. 2002. *Global City-Regions: Trends, Theory, Policy*, Oxford: OUP.
21. Singh R Y (2002) *Geography of Settlement*, Rawat Publication, Jaipur.
22. Sivaramakrishnan (1996) *Urbanization in India*, Concepts Publishing Company, New Delhi.
23. Southhall, A. 1998. *The City in Time and space*, Cambridge, Cambridge University Press.
24. Vaysali Singh (2011) *Urban Geography*, Alfa Publication, New Delhi.
25. White, R. 1994. *Urban Environmental Management*, Routledge, London

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	CO1 Understand the scope and approaches of urban studies and complexities of urban areas
	CO2 Understand the development of transformation of cities over time, morphology and structure of cities
	CO3 Analyse the social organization of the city
	CO4 Develop a basic social, political and economic understanding of contemporary urban issues
	CO5 Assess and evaluate the dimensions of urbanization in India and its trends

ELECTIVE COURSE - 4 (1)

Course Title and Code	MSGGY03E11	RESEARCH METHODS IN GEOGRAPHY			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> To acquaint the students with the basic knowledge about research in terms of identification of research problem, research design, data collection, analysis and report writing. To get an idea about scientific processes and ethics of quality research To develop a keen interest in geographical research and use the knowledge for future work
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Modules	Content	No. of hours
Module 1 Research Methods in Geography	Research – meaning, types of research, Objectives of research, Fundamental research in Geography, Research methodology versus research methods Research Approaches- Ontology and epistemology; Scientific Methods and Scientific Research, Bias and Prejudice in Scientific Research, Research Process, Research Ethics.	18
Module 2 Steps in geographical research	Identification of the problem, Defining the problem, Aims, Objectives, Research questions; Literature review – purpose of literature review, framework of searching, managing your search, search tools: Library Catalogs, Abstracts and Reviews, Citation Indices, Websites, Sources of literature, Evaluating the literature, Formulation of hypothesis and methodology, Research proposal, Research design – need and importance	20
Module 3 Data Acquisition and analysis.	Sources of Data- Primary and Secondary, Qualitative and Quantitative data, Data collection- Questionnaire interview – Semi structured interview and Focused Group Discussions, Field Survey –Ground truth verification, Ethnography of Participants Observation, Photovoice, Participatory research methods- Sampling and data processing- Sampling errors- Data processing analysis and presentation – Using statistics to describe and Explore data – descriptive statistics, explanatory statistics; Computer assisted qualitative and quantitative data analysis.	22
Module 4 Report writing and presentation	Writing research paper and abstracts- Thesis writing – literature review- bibliography- Plagiarism checking, Research and project proposals- Intellectual Property Rights	20

Essential Readings

1. Britha Mikkelsen (2005) *Methods for Development Work and Research*, Sage Publication, New Delhi.
2. Chris Hart (2005) *Doing Your Masters Dissertation*, Vistar Publications, New Delhi.
3. Gerald Guthrie (2010) *Basic Research Methods*, Sage Publication, New Delhi.
4. Hay I (2005) *Qualitative Research Methods in Geography*, Oxford University Press
5. John C Almack (2006) *Research and Thesis Writing*, Cosmo Publications, New Delhi.
6. Misra H N and V P Singh (1998) *Research Methodology in Geography, Social, Spatial and Policy Dimensions*, Rawat Publications, New Delhi.
7. Ranjit Kumar (1996) *Research Methodology*, Sage Publication, London.
8. Varma C A (2013) *Research in Applied Geography*, Swastik Publication, New Delhi
9. Hay. I. (2010). *Qualitative Research Methods in Human Geography*, 3rd ed. Oxford University Press, South Melbourne, Australia,
10. Lunsbury J.F. and Aldrich, F.T. 1979. *Introduction to Geographic Field Methods and Techniques*, Charles E. Merrill Publishing Company, Columbus.
11. Misra, R. P. 2015. *Research Methodology: A Handbook*, Concept Publishing Company, New Delhi.
12. Montello, Daniel R. and Sutton, P.C. 2006. *An Introduction to Scientific Research in Geography*, Sage Publications, London.
13. Oliver, Paul, 2004. *Writing Your Thesis*, Vistaar Publications, New Delhi
14. Preece, R. 1994. *Starting Research: An Introduction to Academic Research and Dissertation Writing*, Continuum, London.
15. Sharma, P.R., R. S. Yadava and Sharma, V.N. 2011. *Research Methodology: Concepts and Studies*, R. K. Books, New Delhi.
16. Stoddard, Robert H. 1982. *Field Techniques and Research Methods in Geography*, Kendall/Hunt for National Council for Geographic Education

Course Learning Outcomes	On completion of the course learner should be able to
	CO1 Analyse the conceptual background of research in geography CO2 Identify and formulate a Research Problem CO3 Examine the various methods of data Collection and Field survey, CO4 Developing skills in Processing and Analysis of Data and writing dissertation CO5 Acquires expertise in Interpretation, Report writing and presentation

ELECTIVE COURSE - 4 (2)

Course Title and Code	MSGGY03E12	POLITICAL GEOGRAPHY			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> To analyse the scope of political geography for the understanding of the development, functioning and interaction of the political ideologies To discuss the strategies in geo-politics especially towards the concept of federalism To critique the geo-polity of India and its international relations To examine the trends and developments of electoral geography
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Modules	Content	No. of hours
Module 1 Approaches to Political Geography	Definition, scope and nature of Political Geography; Approaches - Whittlesey's law-landscape Approach, Hartshorne's Functional Approach, Gottmann's Political partitioning model, Jone's Unified field theory: Idea-area chain; Political Systems Model: Contemporary relevance to these approaches, Soja's Analysis of Political systems, Wallerstein's World-Systems Approach; Recent trends in Political Geography; Concept of nation and state; geopolitics; politics of world resources.	22
Module 2 Dimensions of Geo-politics	Geography and Federalism, Political regions of the world; nature and administrative area and geography of public policy and finance; resource development and international politics; Geographical basis of Indian Federalism. Frontiers & Boundaries: Concept of Frontiers, Boundaries, Distinction between Boundaries & Frontiers. The International Boundary of India & related issues. Global strategic views: Heartland Theory, Rimland theory & Mahan's Sea Power concept. State reorganization; regional consciousness and national integration, India and geopolitics of the Indian Ocean	22
Module 3 Geo politics- Indian context	India's Political Aspects: State reorganization; Emergence of new states; Regional consciousness and interstate issues; Cross border terrorism; India's role in world affairs; The international boundary of India and related issues, Geopolitics of South Asia and Indian Ocean Realm.	20

Module 4 Electoral Geography	Trends in Electoral Geography, Geography of Voter participation, Regional Stability, Regional Realignment, Contextual Effect, A Systems model for electoral geography, A revised model of electoral Geography	16
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Essential Readings
<ol style="list-style-type: none"> 1. Adhikari (1997) Political Geography; Rawat Publications 2. Alexander L.M. (1963) The World Political Pattern (2nd Edition), Chicago, Rand McNally. 3. Bergman E. (1975) Modern Political Geography, Iowa.W.M.C. Brown Co-Publisher. 4. Carlson. I (1971) Geography and World Politics (India Edition), Dehradun, Patil & Datt. 5. DeBlij. H.J. (1972) Systematic Political Geography, New York, Wiley 6. Dikshit, R.D. (1982) Political Geography A Contemporary Perspective, New Delhi. Tata McGraw Hill Publishing Company. 7. Dwivedi R.L. (1990) Fundamentals of Political Geography. Allahabad, Chaitanya Publishing House. 8. Norris. R.E and Haring L.L.(1980) Political Geography, London Charles E Merill Publishing Company. 9. Taylor P.J. (1985) Political Geography. World Economy, Nation-State and Locality, London, Longman

	<i>On completion of the course learner should be able to</i>
Course Learning Outcomes	<p>CO1 Understand the nature, scope, basic concepts and approaches towards political geography.</p> <p>CO2 Evaluate various concepts, theories and models related to political system at international, national, state and local level and critically assess their suitability in present scenario.</p> <p>CO3 Assess the nature of political aspects, its changing trend and its regional disparities among different political boundaries.</p> <p>CO4 Cognitive study on India's role in world affairs; recent geopolitical disputes and suggest suitable policies as a solution for international boundary disputes.</p> <p>CO5 Analyze the political opinion of Indian population through voting trend and assess the spatial disparity in electoral concepts of people within India.</p>

ELECTIVE COURSE - 4 (3)

Course Title and Code	MSGGY03E13	NATURAL RESOURCE MANAGEMENT			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • To make aware about resource availability, accessibility, utilization, its use and misuse. • To explain the spatial distribution of natural resources. • To know the importance of conservation of natural resources and the approaches of natural resource management • To evaluate the scope and status of NRM in India and Kerala
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Modules	Content	No. of hours
Module 1 Fundamentals of Natural Resource Management	Concept and classification of resources- spatial distribution of natural resources; significance of natural resource management; ecological, social and economic dimension of resource management; contemporary issues related to natural resources; concern on productivity issues; resource management paradigms; application of geospatial technology and statistical analysis in natural resource management.	22
Module 2 Overview of natural resources	Types of natural resources – forest resources types and characteristics –status and distribution, interventions of forest and tribal people, strategies of forest management; land resources – land and land use classification, land degradation, man induced landslides, soil erosion and desertification, landscape impact analysis, wetland ecology and management, case studies; water resources – use and over utilization of surface and ground water, dams benefits and problems, water ecology and management case studies.	18
Module 3 NRM- Global scenario	Management of Common International Resources - energy resources – growing energy needs, renewable and non renewable energy resources, use of alternate energy uses, case studies; food resources – world food problems – food security- changes caused by agriculture and over-grazing , effect of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies; fish and other marine resources – production, status, dependence on a fish resource, unsustainable harvesting, issues and challenges for resource supply, new prospects, case studies; ocean; climate; evolution of an international resource management regime.	15
Module 4	Natural resources and management in India –natural resource conservation and management issues and problems;	25

NRM- India and Kerala	<p>Significance of regional planning - Organizations - impact of climate change and global warming; sustainable development and natural resource management; success stories of NRM in India – case studies.</p> <p>Natural resource management in Kerala – Geographical appraisal of natural resources in Kerala- NRM in Kerala, contemporary issues success stories of NRM in Kerala – case studies.</p>	
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Essential Readings	
	<ol style="list-style-type: none"> 1. Berkes, F. (ed.), 1989. Common Property Resources: Ecology and Community Based Sustainable Development, Belhaven Press London. 2. Chopra, K., K.G. Kadekodi, and M.N. Murthy. (1990) Participatory Development: People and Common Property Resource. Sage Publications. 3. Francois Ramade (1984) Ecology of Natural Resources, John Wiley & Sons Ltd. 4. Knight, Richard L., editor, et al. (1995) A New Century for Natural Resources Management, Island Press. 5. Mather, A.S. and Chapman, K. 1995. Environmental Resources, Longman, Harlow, England. 6. Mc Clay, K.R. 1995. Resource Management Information System: Process & Practice, Taylor Francis, London. 7. Mitchell B. 1988. Geography and Resources Analysis, 2nd edition, Longman, London. 8. Mitchell, B. 1997. Resource and Environmental Management, Longman, Harlow, England. 9. Newson, M.D. 1991. Land, Water and Development: River Basin Systems and Management, Routledge, London. 10. Odum, E.P. (1971) Fundamentals of Ecology, W.B. Saunders Co. USA 11. Owen, S. and Owens, P.L. 1991. Environment, Resources and Conservation, Cambridge University Press, New York. 12. Pandey, B. W. (ed.) 2000. Natural Resource Management, Mittal Publication, New Delhi. 13. Rees, J. 1990. Natural Resources: Allocation, Economics and Policy, Routledge, London. 14. Rogers, Peter P., Kazi F. Jalal, and John A. Boyd (2007) An Introduction to Sustainable Development, Earthscan Services. Island Press. 15. Singh, Jagdish, 2006. Sansadhan Bhoogol, Radha Publications, New Delhi (Hindi). 16. Taylor, Russel D., and Torquebiau, Emmanuel (Eds.). 2011. Natural Resource Management and Local Development, Springer, Netherland.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Deep understanding of concept and approaches of Natural Resources Management</p> <p>CO2 Analysis of availability and spatial distributions of natural resources</p> <p>CO3 Examines the issues and constraints in natural resources management</p> <p>CO4 Evaluates the socio-economic, political and technological inputs in Resource management</p> <p>CO5 Apply in-depth perception of planning and policies of natural resource Management</p>

ELECTIVE COURSE - 4 (4)

Course Title and Code	MSGGY03E14	CONTEMPORARY HUMAN GEOGRAPHY			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> Understand fundamental philosophical assumptions and concepts of human geography and advanced understanding of contemporary debates in Geography. Demonstrate knowledge of key concepts and contribution of seminal thinkers and theorists in the field of Human Geography Analyse the relevance of emerging themes in human geography after cultural turn Examine the contemporary trends and practices in Human geography
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Modules	Content	No. of hours
Module 1 Developments in human Geography	Definitions and fundamental concepts of human geography; space, place, nature; scientific and situated knowledge and contemporary issues and debates, defining space and place, understanding different approaches in conceptualising space and place.	20
Module 2 Trends in Post colonial geographies	Post structuralism and Post colonialism - Subaltern geographies, Alternative geographical traditions, Geographies of sexuality and Queer approach. Decolonising geography- Geographers and models of disciplinary progress; Inequality, spatial Justice and ethics; Geography of Poverty (GOP); Third space	22
Module 2 Contemporary trends in Human Geography:	Place-making, processes of place making in everyday lives, identities, difference, exclusion and social inclusions; marginalisation, Geopolitics: Territoriality and power, nationalism, citizenship and governance, conflicts; geographies of domination and resistance.	17
Module 3 Contemporary practices in human geography:	Geographies of body: Performativity, Representation and Sensory sites; Geographies of Governance: Citizenship, governance and social justice and Geographies of Globalisation: Space, time and mobility; theories of development, Re-thinking development, Theorising the landscape,	23

Essential Readings

1. Agnew, J.A. and Duncan, J.S. 2016. The Wiley Companion to Human Geography, Wiley, UK.
2. Agnew, John et. al. (ed.) (1996), Human Geography, Blackwell Publishers London.
3. Benko, G and Strohmayer, U (eds) 2004. Human Geography. A History for the 21st Century, Routledge, London and New York.
4. Bonnet, Alastair (2008) What is Geography? Sage, New Delhi.
5. Cloke, P., Crang, P. and Goodwin, M. (eds.), 2014. Introducing Human Geographies, Third Edition, Routledge, London and New York.
6. Cloke, Paul and Johnston, Ron (2005) Spaces of Geographical Thought, Sage, London.
7. Daniels, S and Lee, R. (eds) 1996. Exploring Human Geography: A Reader, Routledge, London and New York. 7. Hubbard P, Kitchin B and Valentine G. 2008. Key Texts in Human Geography, Sage, London.
8. DeLyser, S. Herbert, S. Aitken, M.Crang, and L.McDowell (2010) The SAGE Handbook of Qualitative Geography. Los Angeles, CA: SAGE.
9. Dickinson, R.E. (1969), The Makers of Modern Geography, London.
10. Dictionary of Human Geography
11. Dikshit, R.D. (1999), Geographical Thought - A Contextual History of Ideas, Prentice Hall of India, New Delhi.
12. Dikshit, Aitken Stuart & Gill Valentine ed. (2006) Approaches to Human Geography, Sage, London.
13. Hartshorne, R. (1959), Perspective on Nature of Geography, Rand McNally & Co.
14. Harvey, David (1969), Explanation in Geography, Edward Arnold, London.
15. Harvey, David (1990) The Condition of Postmodernity, Blackwell, London.
16. Harvey, Milton E and Brian P. Holly (1981), Themes in Geographic Thought, Croom Helm, London.
18. Hubber, Phil et. al. (2002), Thinking Geographically: Space Theory and Contemporary, Human Geography, Continuum, New York.
19. Introducing of Human geography, Clock, Crank and Goodwin (2014)
20. James P.E. and Martin J. Geoffret (1972) All Possible Worlds, John Wiley and Sons, New York.
21. Johnston, R.J. (1988) The Future of Geography, Methuen, London.
22. Johnston, R.J. (2004) Geography and Geographers, Arnold London.
23. Key thinkers in Geography of Space and Place.
24. Kitchin, B and Thrift N (eds) 2009. International Encyclopaedia of Human Geography, Elsevier
25. Kobayashi, A and MacKenzie, S. 1989. Remaking Human Geography, Routledge, London New York.
26. Local literature work indicative towards transformation of society
27. Peet, Richard (1998) Modern Geographical Thought, Oxford Blackwell.
28. Peet, Richard (2003) Radical Geography, (Indian Reprint), Rawat Publication, New Delhi.
29. Soja, Edward W. (1997) Postmodern Geographies, Indian edn. Rawat Publications, New Delhi.
30. Unwin, Tim (1992) The place of Geography, Pearson Education Limited, Essex.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1. Understand fundamental philosophical assumptions and concepts of modern human geography in conceptualising place and space</p> <p>CO2. Demonstrate an advanced understanding of contemporary debates in Geography.</p> <p>CO3 Demonstrate knowledge of key concepts of geopolitics in post colonial human geography</p> <p>CO4. Analyse the relevance of emerging themes in human geography after cultural turn</p> <p>CO5. Understand the dimensions of ongoing practices in Human geography</p>

ELECTIVE COURSE - 5 (1)

Course Title and Code	MSGGY03E15	POPULATION AND WELFARE GEOGRAPHY			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • To understand the nature and scope of population geography • To analyse the spatial dimensions of Mobility and displacement • To introduce the students to the changing approaches in post colonial population studies • To understand/evaluate the association between geographic, demographic and socio-economic attributes of population and the resultant levels of social wellbeing and economic development in an ever-changing space time continuum.
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Modules	Content	No. of hours
Module 1 Changing approaches to Population Geography-	Nature of population geography - Contemporary trends- attributes of Population-spatial pattern and determinants of fertility and mortality- reproduction, health and education- Population problems-optimum population-Theories of population growth – natural law and social law theories - Critical review of population growth theories and models, Malthus, Ricardo, Marx – demographic transition and demographic dividend- critic, Population resource regions	22
Module 2 Migration, Mobility and Displacement	Migration- Factors, processes and typology – Contemporary trends in developed and developing countries - Rural and urban dimensions- dimensions of forced migration- refugees in the world. People's rights in contemporary societies; enclaves and their problems Population as social capital- Status of developed and developing countries. Population and Vulnerability: Displacement – Diaspora and Identity Crisis	18
Module 3 Scope of Welfare Geography	Nature and Development of Welfare Geography, Economic Development and Inequality- Economic policy and Inequality- International and Intra-national. Human Development -HPI, Happiness Index- Indicators of Gender-related Development and Gender Empowerment Measure. Poverty line and Measures of Poverty Alleviation.	15
Module 4 Dimensions of Social well being	Concept social wellbeing -Economic basis and indicators of Social well-being. Indicators of Quality of life. Geography of Poverty, Deprivation of the Backward and Minority Communities. Gender issues. Insecurity of the Child labour, unemployed youth and superannuated persons, dimensions of	25

	poverty in India and Kerala. Intra-urban Inequality in India and Kerala. Indicators of Social well-being relevant to Kerala: Housing, Health and Nutrition, Literacy and Education, Social Security.	
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Essential Readings

1. Bogue D J (1969), Principles of Demography, Wiley, New York
2. Chandana R C (2006) Geography of Population: Concept, Determinants and Patterns, Kalyani, Publishers
3. Clarke, John I, (1971) Population Geography. McGraw Hill
4. Demeny, Paul and Geoffrey McNicoll (1998) Population and Development, Earthscan, London.
5. Garnier B J,(1993) Geography of Population, Longman. London
6. Hassan, Mohammad Izhar,(2005) Population Geography, Rawat Publication, Jaipur
7. Majumdar P K (2010) Fundamentals of Demography, Rawat Publication, Jaipur.
8. Mamoria C B (1970) India's Population Problem, Kitab Mahal
9. Meadow, D.H., Meadows D.L., Randers J., and Behrens W.W. III. 1973. The Limits to Growth. I Report of the Club of Rome, The New American Library, New York.
10. Meadows, D.M. and Meadows, D.L. and Randers, J. 1992. *Global Collapse or A Sustainable Future*, Earthscan Publications, London.
11. National Research Council 1986. Population growth and economic development: policy questions, Washington DC: National Academic Press.
12. National Research Council 2003. *Cities transformed: demographic change and Its implications in the developing world*. Panel on Urban Population Dynamics, M.R. Montgomery, R. Stren, B. Cohen, and H.E. Reed, eds., Committee on Population, Division of Behavioral and Social Sciences and Education, Washington, DC: The National Academies Press.
13. Newbold, K Bruce (2012), Population Geography: Tools and Issues, Rawat Publication, Jaipur
14. Ragavender B V, (2014), Migration: Causes, Consequences and Problems, Abhijeet Publications, New Delhi
15. Sharma, Siya Ram (2008) Population Geography, Murali Lal and Sons, New Delhi
16. Weeks, J.R. 2008. *Population: an introduction to concepts and issues*. 10th edition, Belmont, CA: Thomson Wadsworth.
17. Zachariah and Irudaya Rajan (1997), Kerala's Demographic Transition: Determinants and Consequences, Sage Publications, New Delhi

Course Learning Outcomes	On completion of the course learner should be able to
	CO1 Understand the changing approaches in Population Geography
	CO2 Analyses contemporary trends in Migration, Mobility and Displacement
	CO3 Examines the dimensions of inequalities in human development and scope of welfare geography
	CO4 Assessing the implications of social inequality status and opportunity of the people below the poverty line.
	CO5 Analyse the concept of social well being in the context of India and Kerala

ELECTIVE COURSE - 5 (2)

Course Title and Code	MSGGY03E16	GEOGRAPHIES OF GENDER AND DEVELOPMENT IN SOUTH ASIA			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • To provide students with understanding of particular gender issues in the S. Asian region. • To equip students with an understanding of intersections of these gender issues with the process of development. • To help students in appreciating the role of gender transformative interventions in addressing both the above. • To analyse the status of gender relations and disparities in India and to examine the policies on it
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Modules	Content	No. of hours
Module 1 Dimensions of gender Relations in South Asia:	Gender Roles and Gender Relations in South Asia: South Asia as a geographic and cultural region, transgender roles, gender relations in South Asia, South Asian region as region of 'classic patriarchy'. Gender Disparities in Well Being and Human Development in South Asia: Spatial patterns of sex ratio differentials due to son preference and daughter discrimination, spatial patterns of gender disparities in female literacy, work force participation; gender, health and access to healthcare; land ownership and property rights; Household decision making , patterns of participation in local and national politics.	22
Module 2 Gendered Approaches and Measures of Development	Gender Empowerment Measure (GEM), Gender Development Index(GDI), 'position', 'condition' and 'status' of women, strategic and practical needs, comparison and critique of WID, WAD and GAD approaches to gender and development.	18
Module 3 Gender transformative Interventions and policymaking	Gender and Development in South Asia: Defining empowerment; empowerment, access and agency; characteristics of gender blind, gender neutral and gender transformative Interventions and policymaking; selected case studies.	18
Module 4 Gender and Development in India	Dimensions of spatial patterns of gender disparities- issues and challenges, gender transformative Interventions in India, policies and initiatives- State of Kerala	22

Essential Readings

1. Banu Ayesha, 2016. *Human Development, Disparity And Vulnerability: Women In South Asia*, Human Development Report Background Paper, UNDP.
2. Kapadia, Karin, 2002. *The Violence of Development: The Politics of Gender, Identity and Social Inequalities in India*, Delhi, Kali for Women
3. Beneria, Lourdes, 2003. *Gender, Development and Globalization: Economics as if All People Mattered*, New York and London: Routledge.
4. Louise Edwards and Mina Roces, Eds. 2000. *Women in Asia: Tradition, Modernity and Globalization*, Ann Arbor, MI: University of Michigan Press.
5. Nussbaum, Martha C. 2001. *Women and Human Development: the Capabilities Approach*, Cambridge University Press.
6. World Bank, 2001. *Engendering Development: Through Gender Equality in Rights, Resources, and Voice*, Oxford University Press, 2001
7. Parpart, Jane, Patricia Connelly and Eudine Barriteau, 2000. *Theoretical Perspectives on Gender and Development* International Development Research Centre.
8. March, C., Smyth, I. and Mukhopadyay, M. 1999. *A Guide to Gender Analysis Frameworks*, Oxfam, Great Britain.
9. Viswanathan, Nalini, Lynn Duggan, Laurie Nisonoff and Nan Wiegiersma, (eds.) 1997. *The Women, Gender and Development Reader*. Zed Books.
10. Moser, Caroline, 1993. *Gender Planning and Development: Theory, Practice and Training*, Routledge.

	On completion of the course learner should be able to
Course Learning Outcomes	<p>CO1 Have a critical understanding of S Asia as a geographic region and understanding of particularities of patriarchy within this region.</p> <p>CO2 Appreciate culturally driven gender disparities in well-being, capabilities, opportunities and life chances within the region</p> <p>CO3 Analyse of key approaches to Gender and Development, Concept of GEM and GDI and rankings of Asian countries in comparative perspective.</p> <p>CO4 Appreciate Access, Empowerment and Agency and gender transformative interventions for change.</p> <p>CO5 Critically analyse the spatial patterns of gender disparities in India</p>

ELECTIVE COURSE - 5 (3)

Course Title and Code	MSGGY03E17	SOCIAL GEOGRAPHY WITH SPECIAL REFERENCE TO INDIA			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • Examines the nature and scope of social geography and its development • To acquire knowledge with respect to social and cultural pattern of the society, inculcate social ethics, human values, welfare well being. • To have sense of appreciation and respect for the diversity of perspectives, world views and culture in India • To analyse the dimensions of social change and transformation in the globalized technological era.
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Modules	Content	No. of hours
Module 1 Introduction to social Geography	Nature, Scope and Contents of Social Geography- Emergence of Social Geography- Social variations in space- Causes and Consequences. Social Geography as an academic discipline in India	22
Module 2 Social evolution in India	Part 1: Social Evolution of India Before Colonization: - The Concept, Sources, Limitation and problems of reconstruction: The Prehistoric and the historic Scene – Peopling of India. The Janapadas of Ancient India and Mughal Subhas-continuity and change. Part 2: Social Evolution of India during Colonization and after:- Transformation of the regional structure During colonial period and after Independence: -The social, economic and Political consequences.	18
Module 3 Social structure in India	Spatial distribution of various components of India's Social Structure: - The racial composition. The tribal Social Formation: The Problem of definition, distribution/redistribution. The social and spatial organization of agrarian communities with special reference to the Institution of Caste. Linguistic diversity and the question of identity. Religion in Indian Society Historical background and pattern of current distribution	15
Module 4 Contemporary India	The process of social change and transformation in the globalized technological era. Racial-Caste-Religious-Linguistic and ethnic Minorities their problems and redressal. Communalism, terrorism and bribery.	25

Essential Readings

1. Aijazuddin Ahmad (1999) – Social Geography, Rawat Publications
2. Ali S.M (1966) The Geography of Puranas, Peoples Publishing House, New Delhi
3. Adhikari S (2017) Fundamentals of Political Geography, Rawat Publications
4. Chris Hamnett (1966) – Social Geography A Reader, Taylor and Francis Ltd
5. David M. Smith, (1973) The Geography of Social Well-Being in the United States: An Introduction to Territorial Social Indicators, McGraw-Hill, New York,
6. Dikshit RD (1999) Political Geography, Tata McGraw Hill
7. Dwivedi RL (2007) - Fundamentals of Political Geography, Chaithanya Publishing House
8. Johns E (Ed.) (1975)– Readings in Social Geography, Oxford University Press
9. Hussian M (1999) Human Geography, Rawat Publications Jaipur
10. Paul Knox (1975) Social Wellbeing, A Spatial Perspective, Oxford University Press
11. Ranjith Tirtha (2002) Geography of India, Rawat Publication, Jaipur
12. Robestein J H & Robert S Barren (1990) The cultural landscape : An Introduction to Human Geography, Prentice Hall of India Pvt. Ltd, New Delhi
13. Singh R Y (2003) Geography of Settlements, Rawat Publications, Jaipur
14. Smith D M Social Problems and the City, Geographical Perspectives, Oxford University

	<i>On completion of the course learner should be able to</i>
Course Learning Outcomes	<p>CO1 Understand the link between social aspects with that of Geographical patterns in a region.</p> <p>CO2 Trace out the social inequalities in a region and evaluating the role of historical, social and that of political economies.</p> <p>CO3 Study socio-cultural diversity at national, state and local level; highlight the major impacts of such cultural diversity in a region.</p> <p>CO4 Evaluate the social and cultural well being of population in a region and to assess its positive and negative impact on the development of a region.</p> <p>CO5 Analyse the trends in the process of social change and transformation in contemporary India</p>

ELECTIVE COURSE - 5 (4)

Course Title and Code	MSGGY03E18	APPLIED GEOMORPHOLOGY- COAST AND RIVER MANAGEMENT IN KERALA			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • Introduce the scope of applied geomorphology with special reference to coast and river management scenario of Kerala • Examine the form and processes of fluvial and coastal environment in Kerala • Provide a theoretical as well as analytical base on application of form-process analysis towards sustainable development of the State. • Evaluate the scope and status of Integrated Drainage Basin Management and Integrated Coastal Zone Management in Kerala
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Modules	Content	No. of hours
Module 1 Applied Geomorphology in Kerala	Physical Setting of Kerala- Scope of Applied geomorphology- Geomorphic appreciation of Coast and drainage system of Kerala, Fluvial Processes and Forms-drainage systems and patterns - drainage basin- fluvial cycle of erosion, valley development- profile of equilibrium, Slope processes in fluvial landscapes	22
Module 2 Analysis of Fluvial processes	Channel morphology- morphometric elements and parameters, channel geometry, channel bed topography, Hydrological properties of channels: Morphological properties of channels- dimensions of channel modification and characterization. (Quantification and Interpretation of Fluvial Processes, Calculation of velocity and discharge , Analysis and interpretation of hydrographs, rating curves, and flow duration curves based on field study)	18
Module 3 Coastal Processes and land forms	Classification of coasts- Coastal Morphodynamics: Coastal ecosystems of Kerala: Threats and management. Anthropogenic impacts on coasts; Impacts of climate and sea level change in coasts-Coastal reclamation, sand mining, tourism, Coastal pollution: Sources and management. Coastal development: stakeholders, issues and management, Quantification and Interpretation of Coastal Processes-Preparation of wave refraction diagram. Identification and measurement of sedimentary and biogenic forms. Determination of breaker types by empirical equations. Coastal erosion: Quantification of eroded area and vulnerability zonation. Measurement and Analysis of sediments	15

Module 4 Integrated Drainage Basin Management and Integrated Coast Zone Management	Management of Geomorphic Hazards- Management of landslides, flood, river bank erosion, coastal erosion, salt water intrusion, conservation of coastal ecosystem, mangroves, mangroves, wetland restoration. Socio-economic aspects in coastal and river management, concerns of coastal and tribal communities (Kerala perspective): Types, opportunity and vulnerability - Field study.	25
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Essential Readings

1. Ahmed, E. (1972): Coastal Geomorphology of India', Orient Longmans, Delhi.
2. Bird, E. (2000): Coastal Geomorphology. An Introduction, John Wiley and Sons, Chichester.
3. Bird, E. C. F. (1984): Coasts – An Introduction to Coastal Geomorphology, Australian National University Press, Canberra.
4. Bird, E.C.F. (1985), 'Coastline Changes: A Review, John Wiley, Chichester.
5. Charlton, R.2008. Fundamentals of Fluvial Geomorphology, Routledge, London
6. Chattopadhyay, S. 2017. Geomorphological Field Guide Book on Laterites and Backwaters of Kerala (Edited by AmalKar). Indian Institute of Geomorphologists, Allahabad.
7. Chorley R. J, Schumm, S.A. and Sugden D.E. (1984): Geomorphology, Methuen, London.
8. Cooke, R. U. and Doornkamp, J.C., (1974). Geomorphology in Environmental
9. Chorley R.J. (ed) 'Introduction of Fluvial Processes Methuen & Co. London, 1973.
- 10.Coates D.R. And Vitek J.I. Thresholds in Geomorphology. George Allen Unwin,
- 11.Davies, J.L. (1972): Geographical Variation in Coastal Development, Oliver & Boyd, Edinburgh.
- 12.Douglas, J. and Spencer, I. (1985): Environmental Change and Tropical Geomorphology, George Allen and Unwin, London.
- 13.Garner, H.F. (1974): Origin of Landscapes A synthesis in Geomorphology, Oxford University Press, New Delhi.
- 14.Hart, M.G. (1986): Geomorphology: Pure and Applied, George Allen and Unwin, London.
- 15.John R.hails., 1977. "Applied Geomorphology" Elsevier Scientific publishing Company, New York.
- 16.Nair, K. K.(2007) Quaternary geology and geomorphology of coastal plains of Kerala, Geological Survey of India.
- 17.Prasannakumar,V.(2007) Geomorphology of Kerala, International Centre for Kerala Studies, University of Kerala.
- 18.Sharma, H. S. (ed.) (1991): Indian Geomorphology, Concept, New Delhi.
- 19.Snead, R.E. (1982): Coastal Landforms and Surface Features, Hutchinson Ross, Stroudsburg, Pennsylvania.
- 20.Steers, J. (1971): Introduction to Coastline Development' Macmillan, London.
- 21.Steers, J. A. (1971): Applied Coastal Geomorphology, MacMillan, London.
- 22.Steers, J.A. (1969): The Sea Coast: Oliver Boyd, London.
- 23.Tooley M M and Shennan I (1987): Sea level changes, Basil Blackwell, Oxford, U K.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Understand the nature, scope, basic concepts and approaches towards applied geomorphology with special reference to Fluvial and coastal processes in Kerala</p> <p>CO2 Evaluate various concepts, theories and models related to fluvial geomorphology and to carry out a detailed analysis of Channel morphology and its effects</p> <p>CO3 Analysis of driving forces of Coastal Morphodynamics and its impacts</p> <p>CO4 Equip the students to interpret the geomorphic dimensions of coastal processes</p> <p>CO5 Examines the prospect of Integrated Drainage Basin Management and Integrated Coastal Zone Management & Management of Geomorphic Hazards in Kerala</p>

CORE COURSE - 10

Course Title and Code	MSGGY03C10	Practical III : CARTOGRAPHIC TECHNIQUES FOR SPATIAL ANALYSIS.			
Semester	Hours per week	Credit	Exam. Hours	Marks	
III	10	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • To appraise the students with the application of cartographic methods for spatial analysis. • To unravel the temporal as well as spatial variations in geographical phenomena/objects through the analysis of geographical data using cartographic techniques. • To equip the students in preparation of thematic maps and undertaking analytical tasks. • Impart modern techniques of field study and geodesy
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Modules	Content	No. of hours
Module 1 Maps and map projections	Classification of Maps and Map projections. Construction of graticule for the following projections (graphical method only) Zenithal projections – Gnomonic, Stereographic and Orthographic (Equatorial case only); Conical projection – International projection, Cylindrical projection – Cassini’s projection, Conventional projection – Globular, Gall’s Interrupted Mollweide’s, Interrupted Sinusoidal.	22
Module 2 Thematic mapping and interpretation	Thematic mapping; mapping population data, dot maps, choropleth maps, isopleths, population potential, Mapping agricultural data - index of concentration and diversification Land use maps–choroschematic and chorochromatic Locational sector diagrams. Study of Indian toposheets of different scales: Comparative utility of topomaps, aerial photos and satellite images as sources of geographical data. Preparation of altimetric frequency curves and hypsometric curves of drainage basins. Extraction of radii of curvature and sinuosity and braiding indices of channels. Determination of settlement hierarchy.	18
Module 3 Field Survey and interpretation	Land use survey; Preparation of analytical maps preparation of geomorphological and land use map of a limited area, Preparation of land capability maps. Preparation of landslide risk zonation maps. Preparation of flood risk zonation maps. Preparation of coastal erosion vulnerability maps.	15
Module 4 Geodesy	Plane survey- Methods of calculation of surveyed area and plan preparation - Preparation of maps using total station and GPS, Dumpy level – Preparation of contours- Theodolite Survey– Finding heights of accessible and in accessible points	25

Essential Readings

1. Ashish Sarkar (2009) Practical Geography – A systematic approach, Orient Black Swan, Kolkata.
2. Bangulia A M (2006) Practical Geography, Anmol Publishers Pvt. Ltd.
3. Chorley, R.J. (ed.) 1972. Spatial Analysis in Geomorphology, Harper and Row.
4. Doornkamp, J.C. and King, C.A.M. 1971. Numerical Analysis in Geomorphology: An Introduction, Arnold, London.
5. King, C. A. M. (1966): Techniques in Geomorphology, Edward Arnold Ltd., London
6. Lutgens, F. K. and Tarbuck, E. J. (2010): The Atmosphere: An Introduction to Meteorology, Pearson Prentice Hall, New Jersey
7. Mayer, L. 1990. Introduction to Quantitative Geomorphology, Prentice Hall, New Jersey.
8. Monkhouse F J & Wilkinson H R (1973), Maps and Diagrams, Methuen & Co. Ltd. London
9. Morisawa, M. 1983. Geomorphological Laboratory Manual, John Wiley & Sons, New York.
10. Navarra, J. G. (1979): Atmosphere, Weather and Climate, W. B. Saunders Company, Philadelphia
11. Pal, S.K. 1998. Statistics for Geoscientists: Techniques and Application, Concept Publication Company, New Delhi.
12. Singh L R (2009) Fundamentals of Practical Geography, Sharda Pustak Bhavan
13. Strahler, A. N. (1964): Quantitative Geomorphology of Drainage Basins and Channel
14. Networks, In: Handbook of Applied Hydrology, Ven Te Chow, Ed., Section 4-II, McGraw-Hill Book Company, New York
15. World Meteorological Organization (2008): Guide to Meteorological Instruments and Methods of Observation, WMO-No. 8
16. Zulfequar Ahmad Khan M D (1998) Text book of Practical Geography, Concept Publishing Company.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Develop conceptual background of map projections Construction of graticule for various projections</p> <p>CO2 Apply various techniques of thematic mapping</p> <p>CO3 In depth analysis of Indian toposheets of different scales</p> <p>CO4 Observation of field realities; Processing and Analysis of Field data</p> <p>CO5 Mastering the advanced techniques of Filed survey and mapping</p>

SEMESTER IV
CORE COURSE 11

Course Title and Code	MSGGY04C11	GEOGRAPHY OF AGRICULTURE AND LAND USE PLANNING		
Semester	Hours per week	Credit	Exam. Hours	Marks
IV	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To know the approaches to the study of agricultural geography • To appraise the efforts made to understand the geographical matters that govern the agricultural practices. • To assess the efforts made by scholars to understand the geography of agriculture and to analyse the relationship between ecological/environmental factors and agricultural patterns in order to ensure food security and sustainable development of agriculture. • To analyse the need, scope and methods of sustainable land use planning
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Modules	Content	No. of hours
Module 1 Approaches in agricultural Geography	Definition of agriculture; evolution of agriculture; nature and scope of agricultural studies; elements and factors affecting agriculture – physical, economic, social, institutional and technological; agricultural types and systems; significance of agricultural geography; approaches to agricultural geography; application of GIS and Statistical tools in agricultural studies; agriculture and economic growth; contemporary issues related to agricultural activities	22
Module 2 Agriculture and land use	Agriculture and land use: theories – L. D. Stamp, G. Becker, S. P. Chatterjee, M. Shafi; Von Thunen Theory of agricultural location, Neuman and Morgenstein in theory; Transforming traditional agriculture by Schultz, theory of agricultural development by Mellor, Boserup's theory of agricultural development ; agriculture sustainability and sustainable agriculture models; sources of agricultural data – agricultural statistics and sampling; land use surveys, land capability classification; agricultural regionalization and regional disparity in the world.	18
Module 3 Agriculture	Agriculture and Land Use Survey – Trends in land use survey; Stamp, Lewis and Graham; theories of decision making and choice of land use; survey techniques; crop combination	20

and land use planning	methods – Doi, Weaver, Coppock, Rafiullah and Bhatia; agricultural regionalization – world agricultural regions of D Whittlessey; land suitability and crop suitability analysis; measures of farm efficiency; farm conservation and planning; food security; agriculture ecology – agriculture support and environmentalism, principles behind agri-environment schemes; landscape and farmscape ecology – application of Remote Sensing and GIS –	
Module 4 Indian Agriculture and Land Use Management	Indian Agriculture – agro-climatic and agro ecological regions of India; Green revolution, problems and prospects of Indian agriculture; Indian agriculture during different five year plans; agricultural planning regions in India; agriculture and land use conservation management authorities in India; agriculture scenario in Kerala; major issues and problems of agriculture system in India; successful case studies of sustainable agriculture practices and land use management in Kerala.	20

Essential Readings

1. Dyson T (1996) Population and Food – Global Trends and Future Prospects, Routledge
2. Gobind N (1986)- Regional Perspectives on Agricultural Development. Concept Publishing Company. New Delhi
3. Goh Cheng Leong & Gillian C Morgan (2009) Human and Economic Geography, Oxford University Press, New Delhi, New York
4. Grigg, D.B. 1984. Introduction to Agricultural Geography, Hutchinson, London.
5. Jasbir Singh and Dhillon S S (2004) Agricultural Geography, Tata Mcgraw Hill, New Delhi.
6. Majid Hussain (2003) Agricultural Geography, Anmol Publication, New Delhi.
7. Majid Hussain (2007) Systematic Agricultural Geography, Rawat Publication, New Delhi.
8. Mamoria C B (2008) Agricultural problems of India, Kitab Mahal, Patna.
9. Mannion.A.M.(1995) Agriculture and Environment Change, Wiley Blackwell
10. Mohammad, N. 1992. New Dimension in Agriculture Geography, Vol. I to VIII, Concept Publishing Company, New Delhi.
11. Mohammad, N. and Rai, S.C. 2014. Agricultural Diversification and Food Security in the Mountain Ecosystem, Concept Publishing Company, New Delhi
12. Mohammed Shafi (2006) Agricultural Geography, Pearson Education, New Delhi.
13. Roling, N.G., and Wageruters, M.A.E. (eds.) 1998. Facilitating Sustainable Agriculture, Cambridge University Press, Cambridge.
14. Shafi. M (1984) Agricultural Productivity and regional Imbalances – A Study of Uttar Pradesh, Concept Publishing Company
15. Sharma B L (1991) Applied Agricultural Geography, Rawat Publication, New Delhi.
16. Singh, J., and Dhillon, S.S. 1994. Agricultural Geography, Tata McGraw Hill,

New Delhi.

17. Singh, R. B. 2000. Environmental Consequences of Agricultural Development: A Case Study from the Green Revolution state of Haryana, India, Agriculture, Ecosystems and Environment 82, 97-103.
18. Symons, Leslie (2018)- Agricultural Geography, Routledge
19. White P. 2007. Emergence of agriculture: A global view, Routledge, London.
20. Wright J. 2009. Sustainable agriculture and food security in an era of oil scarcity, Earthscan, London.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	CO1 Analyse various approaches to agricultural geography. CO2 Examines the scope of various theories on agriculture and land use. CO3 Develops skill to undertake land use surveys and land capability analysis at different scales CO4 Integrates the concepts of Agriculture and land use planning and develop suitable agricultural models. CO5 Critically evaluates the scenario of Indian agriculture and land use management

OPEN COURSE - 1 (1)

Course Title and Code	MSGGY04001	KERALA - ENVIRONMENT AND DEVELOPMENT			
Semester	Hours per week	Credit	Exam. Hours	Marks	
IV	4	4	3	100	

Course Objectives	<ul style="list-style-type: none"> • To analyse the bio-physical setting of Kerala • To provide students with understanding of current state of environment of Kerala • To equip students with an understanding of intersections of environmental issues with the process of development • Examine the socio-cultural and economic base of Kerala and evaluate the approaches of development in Kerala context
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Modules	Content	No. of hours
Module 1 Physical setting of Kerala	Location; Physiographic setting of Kerala – Highlands, Midlands and Lowlands –, Geology, drainage, vegetation types, climatic characteristics, soil, agriculture, land utilization, agro-climatic zones, Tourism in Kerala	25
Module 2 State of Environment	The Western Ghats and Foothills -Ecological history and significance, Major conservation sites; Environmental issues – human intervention and impacts – land use change, mining, soil erosion, pollution; Western Ghats protection reports Status of rivers and Wetlands –Environmental significance, status of river systems in Kerala; Wetlands - Definition, significance and classification, status of wetlands in Kerala-dimensions of human intervention and impacts	15
Module 3 Issues and movements	Case Studies of Salient Valley movement of Palakkad, Anti Coco Cola Movement of Plachimada, Anti Endosulfan movement of Kasargod, Anti Nitta Gellatin movement of Kathikudam, Anti Quarrying movements- status of Environmental policy in Kerala	15
Module 4 Kerala people and Economy	Demographic scenario-migration- socio-economic as well as cultural back up of Kerala Model of development - Significance of Kerala Model and critics- Rebuild Kerala initiative, Disaster management in Kerala, Sustainable development - Case study.	25

Essential Readings

1. Chandrasekharan C., Forest as resource-perspectives in The Natural Resources of Kerala, WWF, Thiruvananthapuram, 1997, pp. 422-423.
2. Chattopadhyay, S. 2017. Geomorphological Field Guide Book on Laterites and Backwaters of Kerala (Edited by AmalKar). Indian Institute of Geomorphologists, Allahabad.
3. Cooke, R. U. and Doornkamp, J.C., (1974). Geomorphology in Environmental
4. Government of Kerala. Urban policy and Action Plan for Kerala. Available from <http://www.kerala.gov.in/annualprofile/urban.htm>.
5. Human Development Report,(2005) State Planning Board Government of Kerala.
6. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
7. Kamalakshan Kokkal, Environmental Problems of Kerala. (Malayalam, Keralathile Paristhithi Prashnangal), Thiruvananthapuram, STEC, 2002, pp. 3 1-32. Management- A Introduction, Clarendon Press, Oxford.
8. Nair, K. K (.2007) Quaternary geology and geomorphology of coastal plains of Kerala, Geological Survey of India.
9. Prasannakumar,V.(2007)Geomorphology, International Centre for Kerala Studies, University of Kerala.
- 10.State of Environment Report Kerala, (2007). Land environments, Wetlands of Kerala and Environmental Health. Vol I.
- 11.State of Environment Report Kerala, (2007). Natural Hazards. Vol I. KSCSTE, Government of Kerala.
- 12.State Planning Board, Thiruvananthapuram (2017). Economic Review.
- 13.The Ministry of Environment and Forests Government of India,(2011).Report of the Western Ghats Ecology Expert Panel Part I.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>CO1 Analyse the physical setting of Kerala and its influence on socio- cultural fabric.</p> <p>CO2 Appreciate the geography of the Western Ghats and Foothills and analyse the contemporary environmental issues in the region</p> <p>CO3 Critically analyse the status of rivers and Wetlands in Kerala</p> <p>CO4 Evaluate the ecological issues and movements through case studies.</p> <p>CO5 Critical examine of state of Kerala economy & Development</p>

OPEN COURSE - 1 (2)

Course Title and Code	MSGGY04O02	GEOGRAPHY AND DISASTER MANAGEMENT- KERALA PERSPECTIVE		
Semester	Hours per week	Credit	Exam. Hours	Marks
IV	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • Examines the key concepts and approaches in disaster management • Analyse the geographical base in Disaster management with reference to Kerala • Understand the bio-physical setting of Kerala, state of environment and to identify major disaster prone areas • Evaluate the scope and significance of DM in Kerala and role of Geo-informatics in it
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Modules	Content	No. of hours
Module 1 Geography and DM	Nature and type of disasters- Key concepts and approaches in DM; Crisis approach – early detection, warnings and communication - Risk and risk reduction – phases of DM, SOP, Geography and DM Human ecology, vulnerability types, vulnerable communities and resilience, adaptation and mitigation – Contextualizing climate change – theoretical considerations.	22
Module 2 Geography of disasters	Concepts in physical and social/human geography as determinants in disasters; Tropical cyclones and disaster risk mitigation in coastal Kerala -Disasters in the context of changes in climate and weather in mountainous terrain (relief, climate, soil, drainage, vegetation) –Land use and landslides–Floods, flood-plains and river basins – Ocean acidification and fishing communities – Sea level rise impacts on coasts and islands.	18
Module 3 Environment of Kerala and its threats	Geo-setting of Kerala, History of hazards and disasters and emerging geographical patterns: Case studies – Tsunamis-2014, Ockhi and Kerala flood 2018 and deluge – Critical evaluation of Gadgil, Kasturirangan and Oommen reports in the light of development paradigms for coastal,	15

	mountain/hill area development.	
Module 4 Disaster Management and Kerala-	Inequality, social stratification and disasters – culture and the social construction of disasters – culture as a source of resilience and vulnerability–conceptual, ethical and methodological issues in disaster research – Management issues: community based disaster management. Application of geo-informatics	25

Essential Readings

1. Agarwal Anil and Narain Sunita (Ed) (1999): State of India's Environment the Citizens Report, Centre for Science and Environment, New Delhi
2. Asian Disaster Preparedness Centre. 2008. Monitoring and reporting progress on community-based disaster risk management in Philippines, partnerships for disaster reduction—South East Asia Phase 4. Bangkok: Asian Disaster Preparedness Centre.
3. Bryant Edward (2000): Natural Hazards, Cambridge University Press
4. Centre for Earth Science Studies, 1997. Report of the workshop of Research Agenda, Environment Development Interface in Kerala. Trivandrum.
5. Chattopadhyay, Kumar, GLIMPSES OF KERALA THROUGH MAPS, Centre for Earth Science Studies, Thiruvananthapuram, April, 2013.
6. Chattopadhyay,S and Chattopadhyay, M.,1995. Terrain Analysis of Kerala: Concept, Method and Application (Technical Monograph No.1/95, State Committee on Science, Technology and Environment, Government of Kerala, Thiruvananthapuram)
7. Chattopadhyay,S, Velayutham,S and Salim,M B, 1986. Trends of deforestation in Kerala. In India's Environment: Problems and Perspectives, eds. B P Radhakrishna and K K Ramachandran.
8. CSE (2019) State of India's Environment 2019. <http://www.downtoearth.org.in/>
9. Daly Herman E and Twonseed Keneth N (Ed) (1993): Valuing the earth – Economics, Ecology and Ethics, MIT Press, London
10. Delica-Willison, Z. (2005). Community-based disaster risk management: Local level solutions to disaster risks. Tropical Coasts, 12(1), 66–73.
11. DIPECHO. (2010). Community-based best practices for disaster risk reduction (pp. 1–119). Maputo: UNDP.
12. Dupont, R.R. Baxter, T.E. and Theodore, L. (1998): Environmental Management: - Problems and Solutions, CRC Press.
13. Franke R,1993. Life Is a Little Better: Redistribution as a development strategy in Nadur village, Kerala. Westview Press, Colorado Geological Society of India, 1976.
14. Geology and Mineral Resources of the States of India, Part IX, Kerala, Misc. Pub. 30 72 Geological Society of India, Bangalore. PP 289 – 298.
15. Chattopadhyay,S and Carpenter, R A, 1991. Sustainable development: Scientific jargon or a practical management alternative? Annals, National Association of Geographers, India, Vol.XI, No 2, pp 112.

16. Kerala State Land Use Board, 1995. Land Resources of Kerala, Government of Kerala, Trivandrum
17. M.G., Gardner, R.H., and Graham, G., 1995. Sustainability at landscape and regional scale. In *Defining and Measuring Sustainability - The Bio-geophysical Foundations*, edited by Mohan Munshinge and Walter Shearer (The United Nations University and the World Bank), pp 137- 143.
18. Morrisawa M (Ed) (1994): *Geomorphology and Natural Hazards*, Elsevier, Amsterdam
19. Munasinghe, M and McNeely, J, 1995. Key concept and terminology of sustainable development. In *Defining and Measuring Sustainability - The Bio Geophysical Foundations*, edited by Mohan
20. Nair, K. M., 1995. Geological history and natural resources of lowlands of Kerala in *Science and Technology for Development* (State Committee on Science, Technology and Environment, Government of Kerala, Thiruvananthapuram

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	CO1 Understand the nature, scope, basic concepts and approaches towards Disaster Management
	CO2 Evaluate various concepts, theories and models related to Human ecology at international, national, state and local level in present scenario.
	CO3 Assess the significance of Concepts in physical and social/human geography as determinants in disasters.
	CO4 Assessing the various responses in the State of environment of Kerala and its threats.
	CO5 Examines the background of disasters in Kerala and analyze the significance of Disaster Management in Kerala.

OPEN COURSE - 1 (3)

Course Title and Code	MSGGY04O03	URBAN DEVELOPMENT AND MANAGEMENT		
Semester	Hours per week	Credit	Exam. Hours	Marks
IV	4	4	3	100

Course Objectives	<ul style="list-style-type: none"> • Acquaint the students with contemporary urban issues and its various components. • Examines the questions related to urban poverty and slums in India. • Critically evaluates the infrastructure development and programmes & policies aimed at sustainable urban development and management strategies. • Evaluate the status of Urban planning in India towards sustainable Development
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Modules	Content	No. of hours
Module 1 Urban miseries	Problems of urban growth, Urban Issues and Components: Concept of urban development and management; urbanization: trends, patterns; challenges in developing world. Urban Poverty Alleviation: Concept of urban poverty, poverty and informal sector; urban basic services for the poor; employment opportunities; Case studies	20
Module 2 Slum management	Nature of slums, Slum Improvement and Upgradation in India: Nature of slum; evaluation of slum improvement programmes and schemes; resettlement and rehabilitation actions; infrastructure development in slums; Case Studies.	20
Module 3 Infrastructure Development Management:	Infrastructure Development, Urban land use planning; water supply and sanitation; housing; traffic; disaster management. case study	15
Module 4 Sustainable Urban Development and Planning	Urban planning in India- Integrated infrastructure development planning; Management towards sustainable cities; Government programmes and policies.- Case study- Urban planning in Kerala Context	25

Essential Readings

1. Atkinson, A. et. al., 1999. *The Challenges of Environmental Management in Urban Areas*, Ashgate Pub. Co., Sydney.
2. Gilbert, R., Stevenson, G. H. and Stren, R. 1996. *Making Cities Work*, Earthscan Publications, London.
3. Hardoy, J.E., Mitlin, D. and Satterthwaite, D. 1992. *Environmental Problems in Third World Cities*, Earthscan, London.
4. Joss, Simon, 2015. *Sustainable Cities: Governing for Urban Innovation*, Palgrave, London.
5. Kundu, A. 1993. *In the Name of Urban Poor: Access to Basic Amenities*, Sage, Delhi.
6. Maitra, A. K. 2000. *Urban Environment in Crisis*, New Age International Publishers, New Delhi.
7. Pugh, C. 1996. *Sustainability, the Environment and Urbanization*, Earthscan Publications, London.
8. Ronald, J. F., et.al. 1994. *Mega City Growth and the Future*, United Nations University Press, New York.
9. Singh, K. and Steinberg, F.M. 1996. *Urban India in Crisis*, New Age International Limited Publications, New Delhi.
10. Singh, R.B. (ed) 2006. *Sustainable Urban Development*, Concept Publishing Company, New Delhi.
11. Singh, R. B. (ed) 2015. *Urban Development Challenges, Risks and Resilience in Asian Mega Cities*, Springer, Japan.
12. Sivaramakrishnan, K.C. 2001. *Problems of Governance in South Asia*, Centre for Policy Research, New Delhi.
13. Timothy, B. 2009. *Sustainable Urban Development*, Routledge, London
14. Wheeler, S.M. and Beatley, T. 2014. *The Sustainable Urban Development*, Routledge, New York.

Course Learning Outcomes	On completion of the course learner should be able to
	<p>CO1 Enable the students to understand the concepts and components of urban development and management.</p> <p>CO2 The students will be able to analyse the urban poverty alleviation</p> <p>CO3 The students will be able to analyse the dimensions of slum life at different scales.</p> <p>CO4 The students will be able to get updated knowledge of urban infrastructure development management and urban governance.</p> <p>CO5 The learner analyses the strategies for Sustainable Urban Development and Management with special reference to Kerala</p>

Course Title and Code	MSGGY04C12	Practical IV – ADVANCED TECHNIQUES OF GEO-SPATIAL ANALYSIS		
Semester	Hours per week	Credit	Exam. Hours	Marks
IV	10	4	3	100

Course Objectives	<ul style="list-style-type: none"> • To equip students with advanced techniques of geo-informatics • Provide hands-on practical exercises for the extraction of spatial information from digital remote sensing images • Equip students to handle various GIS analysis to suggest remedies to contemporary issues.
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Modules	Content	No. of hours
Module 1 Basic principles of Photogrammetry	Marginal information of aerial photographs Methods of stereoscopic viewing, Stereographic test, applying elements of Visual image interpretation – Interpreting Natural environment – Geomorphology and lineaments, vegetation, drainage pattern, cultural features, transportation, mapping terrain forms, Land use / Land cover, Determination of photo scale.	22
Module 2 Image interpretation	Satellite Image- Annotation, Marginal information, Visual Image interpretation. Image preprocessing, Image Enhancement, Generating False Colour Composite, Generating Spectral Response Pattern of land cover classes, supervised classification of images, Change Detection Analysis.	18
Module 3 Fundamentals of GIS	Introduction to GIS Softwares, BHUVAN, Google Earth and Google Maps, Open Street Maps India, MapServer, GeoServer, Map Guide, WRIS- Uploading Map to GIS platform Geo referencing -Spatial Referencing–Use Sample Maps in Software to check different Coordinate Systems -. RMS error Checking, Saving spatially referenced Map in TIFF, GIF, IMG formats.	15
Module 4 Geographic Data and Thematic Visualization	Working with analysis tools- Spatial Analysis - Buffer, Overlay, Union, Network ,Topology and its significance, Methods and applications of Spatial analysis, Using ASTER / SRTM data to Prepare DEM, TIN, Slope, Aspect, Contour Maps. Extracting Spatial Elevation data from Google Earth web application, Creating DEM and Contour Map Layout Setting, Exporting / saving map in different formats- Application of geospatial technology in various fields.	25

Essential Readings

1. ArcGIS 10.3 Manuals, 2019.
2. Aronoff S,(1989) Geographic Information Systems: A Management Perspective, WDL Publications
3. Burrough, P.A. (2005), Principles of GIS for Land Resource Assessment, Oxford Publications, 2005
4. Canty, M.J. (2014). Image Analysis, Classification and Change Detection in Remote Sensing, 3rd Edition, CRC Press.
5. Chrisman N R (2001) Exploring Geographic Information System, Wiley
6. Gibson, P.J., Power, C.H., Rudahl, K.T. and Goldin, S.E. (2000) Introductory Remote Sensing: Digital Image Processing and Applications, Routledge.
7. Gonzalez, R.C. and Woods, R.E. (2007) Digital Image Processing, 3rd Edition, Pearson.
8. Jensen, J.R. (2015). Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson.
9. John E. Harmon & Steven J. Anderson (2003) The design and implementation of Geographic Information Systems, John Wiley & Sons, Ian Heywood et.al (2002) An Introduction to Geographical Information System, Pearson Education Private Limited, Delhi.
10. Kraak, M. and Brown, A (2001) Web Cartography: Development and Prospects, Taylor and Francis, London.
11. Kang Tsung Chang (2008) Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.
12. Loo C P and Albert K W Y (2004) Concepts and Techniques of Geographic Information Systems, Prentice Hall of India, New Delhi.
13. Liang, S. (2004) Quantitative Remote Sensing of Land Surfaces, Wiley.
14. Mather, P. M. and Koch, M. (2011) Computer Processing of Remotely Sensed Images: An Introduction, 4th Edition, Wiley-Blackwell.
15. Marble, D.F & Calkins, H.W.(1990) Basic Readings in Geographic Information System, Spad System Ltd.
16. Michael N DeMers (2005) Fundamentals of Geographic Information System, John Wiley and Sons, New Delhi.
17. Paul A Longley et.al (2001) Geographic Information System and Science, John Wiley and Sons, Chichester.
18. ENVI Image processing software User Manual
19. Richards, J.A. (2013) Remote Sensing Digital Image Analysis: An Introduction, Springer.
20. Star J and Estes (1989) Geographic Information Systems: An Introduction, Prentice Hall
21. Tereshenkov, A (2009). Web GIS Application in Local Government, VDM Verlag,
22. Thanappan Subash. (2011) Geographical Information System, Lambert Academic Publishing,
23. W. B. Green (1982) Digital Image Processing- A Systems Approach, Van- Nostrand Pub. Co.

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	<p>C01 Understanding of Basic principles of Photogrammetry</p> <p>C02 Familiarize the Satellite Image as a resource for spatial analysis and analyse temporal, spectral and spatial differences of satellite data using image processing software</p> <p>C03 Understanding of prospects of GIS Softwares</p> <p>C04 Analysis and Assessment of geographical problems from the GIS platform</p> <p>C05 Examines the application of geospatial technology in various fields</p>

CORE COURSE - 13

Course Title and Code	MSGGY04C13	DISSERTATION		
Semester	Hours per week	Credit	Marks	
IV	4	4	100	

Course Objectives	<ul style="list-style-type: none"> • To develop skills which enable the synthesis of knowledge and improve scientific field work, data collection, analysis and writing skills. • To develop and enhance independent research skills.
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Selection of Topic:

Students are required to search, collect and review various research articles published in chosen area of research. A student has to select a topic for his dissertation, based on his/her interest. The project can be taken highlighting any issue relating to geographic knowledge, from within any one of the systematic branches of the subject, or of its interfaces.

M.Sc dissertations are to demonstrate a student's ability to formulate a geographic research problem, collect and analyze relevant data or appropriate literature, arrive at logical conclusions, and to present the entire exercise at a seminar in the department.

Project proposal: Each student has to prepare and present a project proposal towards the end of the third semester. The proposal may consists of

1. Tentative Title of the study:
2. Introduction: Brief explanation of the study and its relevance
3. Statement of the research problem: Discuss the problem to be addressed in the Research: the gaps, perplexities, or inadequacies in existing theory, empirical knowledge, practice, or policy that prompted the study. First state the problem generally, and then state the specific that your research will address.
4. Briefing on the Study area : A brief description of the study area dealing the bio-physical as well as socio-economic setting of the region selected for case study with base maps.
5. Review of literature: The literature review should portray the theoretical foundations of research paradigm and methodology. It should examine prior research and thought relevant to key aspects of proposed dissertation work.
6. Brief discussion on the proposed theoretical framework of your study, relevance, rationality etc.
7. Research Questions/Hypothesis
8. Aims and objectives
9. Methodology
10. An outline of the proposed chapters of the dissertation
11. Expected outcome
12. Time line of project

13. References

M.Sc Geography dissertations are more often-learning experiences than substantive contributions to the field. Students can select the topic in consultation with their supervisor. The dissertation may be carried out within one of the systematic branches of the subject, or in an interdisciplinary nature. There will be generally no restrictions on the type of geographical study that one can undertake. But it should invariably follow all the steps in research methodology of Geography. A student shall be required to submit three copies of dissertation report on the research work carried out by him/her under the supervision of a faculty member or in a research institute/industry with guidance from expert there to the department 10 days before the commencement of the fourth end semester examinations. The project report / dissertation should contain minimum of 50 pages or 15,000 words excepting maps and figures.

Essential Readings

1. Baxter, L., Hughes, C. & Tight, M. (1996) How to research. Open University Press.
2. Bell, J. (1993) Doing your research project. Open University Press.
3. Bird, J. (1993) The changing worlds of geography: a guide to concepts and methods. Clarendon
4. Clifford, N. & Valentine, G., (2003) Key Methods in Geography. Sage.
5. Cooper, B.M. (1964) Writing technical reports. Penguin.
6. Creswell, J.W. (1994) Research design: qualitative and quantitative methods. Sage.
7. Daniel R. Montello and Paul Sutton, (2006), An Introduction to Scientific Research Methods in Geography and Environmental Studies
8. Haines-Young, R.H. & Petch, J.R. (1986) Physical Geography: its nature and methods. Harper. Johnston, R. (1991) Geography and geographers. 4th edition. Arnold.
9. Kate L. Turabian, (2018), A Manual for Writers of Research Papers, Theses, and Dissertations,
10. Eighth Edition: Chicago Style for Students and Researchers (Chicago Guides to Writing, Editing, and Publishing) Eighth Edition

Course Learning Outcomes	<i>On completion of the course learner should be able to</i>
	CO1 Identify a topic related to the discipline which necessarily has a spatial component
	CO2 To formulate research objectives, research questions and a suitable research design.
	CO3 Make a critical review of the available literature on the topic
	CO4 Conduct independent research to formulate and solve the chosen problem
	CO5 To report the investigation, present and defend the thesis.

CORE COURSE - 14

Course Title and Code	MSGGY04C14	COMPREHENSIVE VIVA VOCE AND STUDY TOUR/FIELD WORK REPORT	
Semester		Credit	Marks
IV		3+1 = 4	75+25 = 100

COMPREHENSIVE VIVA VOCE

Comprehensive Viva voce is to be conducted along with the Practical examination of the Fourth Semester.

Course Objectives :To assess the overall knowledge of the student in the relevant field of Geography acquired over 2 years of study in the Post graduate program.

Content: The viva shall normally cover the subjects taught in all the semesters of M Sc Geography programme with special reference to their project work.

Examination: Viva will be conducted at the end of 4th semester which will be covering the complete syllabus. This will test the student's knowledge, Understanding and skills in geography acquired during the course of their M.Sc programme. It will help the students to face interviews both in the academic and the industrial sector.

Course Learning Outcomes:

On completion of the course learner should be able to

1. Comprehensive Viva Voce assesses the student's skill at presenting his/her understandings, views and perceptions in the subject.
2. It will demonstrate his/her ability to participate in academic discussion with research colleagues.
3. Viva voce confirms the state of knowledge level of the student and he/she can defend it verbally.
4. Viva investigates student's genuineness of their project work and establishes whether the student is of sufficiently high standard to merit the award of the degree for which he/she is undergoing.
5. Viva provides students an opportunity to clarify and develop the written thesis/examination in response to the examiners' questions

STUDY TOUR/FIELD WORK

Study tour / Field work will be conducted during the Third/fourth semester of the M.Sc Geography programme and a report of the same should be submitted by the students

Course Objectives

- To provide opportunities for experiential learning and offer both group and self-directed activities that enable students to explore spatially varied features, cultures, practices and people.
- To enhance the knowledge of the students through observing, mapping, measuring and recording real world phenomena and to explore the processes that form and transform environments.

It shall be the discretion of the department either to conduct Study Tour or to engage the students in Field Work in a particular batch of the programme. It should be planned and executed under the guidance, supervision and participation of a faculty from the Department. The duration of the study tour/field work should not exceed 15 days. Study tour / Field work will be conducted during the Third/fourth semester of the programme and a report of the same should be submitted by the students in the prescribed format within 30 days from the culmination of the task. ***The evaluation of Field work /Study tour shall be internal.***

Course Learning Outcomes

On completion of the course, learner should be able to

1. To understand the significance of travel & field work in geographical studies and to know about different types of field techniques. It enables them to prepare and disseminate the study tour/ fieldwork report.
2. Study Tour/Field Work exposes the students to the outside world, be it local & global issues.
3. This allows them to acquire fresh perspectives based on their presence in an informal environment. It improves them with a new prospective understandings and helps in developing overall personality.
4. While classroom/ Laboratory based learning may give students an opportunity to apply their learning on hypothetical situations, Study Tour/Field Work, on the other hand, makes them face real-life problems. Coming up with solutions makes them innovative thinkers.
5. Study Tour/Field Work away from the comfort of University Campus and home fosters independence, leadership skills, and communication skills among young geographers.

Model Question Paper
First Semester M.Sc Degree (CBCSS) Examination
GEOGRAPHY

MSGGY01C01 - NATURE AND PHILOSOPHY OF GEOGRAPHY
(2020 Admission onwards)

Time : 3 hours

Max: Marks : 60

SECTION A

Answer **any five** questions (Each question carries 3 marks)

1. Multidisciplinary nature of Geography
2. Dualism and Dichotomy in Geography
3. Quantitative Revolution
4. Geography of Poverty
5. Areal Differentiation
6. Welfare approach in Geography

(5 x 3 = 15)

SECTION B

Answer **any three** questions (Each question carries 5 marks)

7. Identify and differentiate the views of the proponents of Determinism and Possibilism
8. Examine the Darwin's influences in geographical knowledge
9. How inductive and deductive approaches influenced the development of Geographical innovations from past to present.
10. Now geography has passed from descriptive to model formulation stage" Explain the paradigms in Geography
11. Quote the similarities that you observe in dealing with Positivism and Existentialism

(3 X 5 = 15)

SECTION C

Answer **any three** questions (Each question carries 10 marks)

12. Examine the imperialistic influences in conceptual nature of Geography
13. The period of Romans and Greeks are called the classical period of Geographical development. Justify
14. Discuss the growth phases of geographical knowledge in the frame of paradigms until the current times
15. Explain the role of Positivism in geographical research which helped in the development of geography in modern times'
16. Darwin's biological theory had a strong influence not only in the development of theories, related to political geography but also in physical geography. Explain.

(3 x 10 = 30)
