REGULATIONS AND SYLLABUS
FOR

M.Sc. GEOGRAPHY

(Choice Based Credit System)

[FOR THE YEAR **2021-22** ONWARDS]

PONDICHERRY UNIVERSITY
PUDUCHERRY - 605 014

a) **Aim of the Course**

Credit Based Choice System (CBCS) at post graduate level programme is aimed at:

i. Offering courses on Credit mode and enrich the quality of teaching-learning process at higher education level.
ii. Encouraging faculty members to design and develop newer soft core courses.
iii. Enabling the students to make choice between different soft core courses to suit to their required specialization.
iv. Facilitating credit transfer from course offered through SWAYAM/ MOOCs platforms and courses of other National Institute under special MOUs.

b) **Eligibility for Admission**

Candidates who have passed any bachelor Degree Examinations in Geography of Pondicherry University or any other Universities are eligible for admission to the course, provided they have secured a minimum of 55% marks in the optional subjects (50% for SC Candidates).

c) **Duration of the Course**

M.Sc. Geography course shall extend over 4 semesters in two academic years.
Each semester will consist of 16 weeks or more, each with a maximum of 90 working days of instructions.

d) **Eligibility for Admission to Examination**

Attendance

The course (theory, practical etc.) shall be treated as an independent unit for the purpose of attendance.
A student shall attend a minimum of 75% of the total instruction hours in a course including assignments and seminars in each semester.
There shall be no provision for condonation of shortage of attendance and a student who fails to secure 75% attendance in a course shall be required to repeat that semester.

e) **Medium of Instruction**

The medium of instruction shall be English only

f) **Definitions of Keywords**

Programme - An educational programme leading to award of a Degree, Diploma or Certificate.

Programme Committee - Programme Committee supervisesand facilitates the implementation of CBCS. It supervises the Academic activities of the department. A Programme Committee meets at least two times in a semester to discuss implementation of the program.
Programme Committee consists of:

- All Faculty members in the Department who are offering Hard Core/Soft Core courses
- Two Student Representatives, one each from I year and II year based on their Academic Merit

Course - Usually referred to, as 'papers' is a component of a programme. All courses do not carry the same weight. The courses define learning objectives and learning outcomes. A course is designed to comprise lectures/ tutorials/laboratory work/ field work/ outreach activities/ project work/ vocational training/viva/ seminars/ term papers/assignments/ presentations/ self-study etc. or a combination of some of these.

Core course- This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

Elective course - Elective course is a course which can be chosen from a pool of papers.

Repeat course- If a student gets (i) less than 40% in the internal assessment and fails in the course or (ii) fails to get the required attendance, the student shall repeat the course when offered.

Choice Based Credit System (CBCS) - The CBCS provides choice for students toselect from the prescribed courses (core, elective or minor or soft skill courses).

Credit - A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

Letter grade - It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Grade point - It is a numerical weight allotted to each letter grade on a 10-point scale.

Credit point - It is the product of grade point and number of credits for a course.

Semester Grade Point Average (SGPA) - It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

Cumulative grade point average - It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

Academic year –Two consecutive (one odd + one even) semesters constitute one Academic year.

Semester – Each semester will consist of 16-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June.

g) Scope and Coverage

The CBCS 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.

h) Course structure/ course design

The course has a total of 72 credits distributed over four semesters.

Course structure/ course design for M.Sc. Geography (Choice Based Credit System)

PG Programme
Total Hard Core = 48 Credit
Total Soft Core = 24 Credit
Total = 72 Credit

I[st] Semester	II[nd] Semester	III[rd] Semester	IV[th] Semester
Hard Core 18 Credits	Hard Core 18 Credits	Hard Core 6 Credits	Hard Core 6 Credits
Soft Core 2 Credits (Lab/Field Studies/Viva)	Soft Core 2 Credits (Lab/Field Studies/Viva)	Soft Core 10 Credits (Elective Stream)	Soft Core 10 Credits (Elective Stream)
Total 20 Credits	**Total 20 Credits**	**Total 16 Credits**	**Total 16 Credits**

M.Sc. Geography Course Structure will contain

14 Hard Core Subject – 48 Credits

06 Soft Core Subject (Theory) – 12 Credits

06 Lab/Project work/Field study/ Viva, etc. – 12 Credits

Total = 72 Credits

Non Audit Courses Winter/ Summer Activities

SL. No.	Non Audit Courses	Credits
1	Skill Development / Soft Skill Work Shops (Min Duration - 15 days)	2 Credits
2	Innovation and entrepreneurship development Workshops industry-interface incubation and start-up programmes	2 Credits
3	Village adoption/ Awareness camps/SHG, Basic literary clubs (15 days)	2 Credits
4	NSS/NCC Camps/ Swatch Bharat/ Traffic maintenances' activities/ Govt. Schemes (2 Weeks)	2 Credits
5	Participation in Seminars/ Conferences/ Inter Collegiate meets/ Science day celebration (Any three Events)	2 Credits
6	Completion of any one/two MOOCS/ SWAYAM Courses (30 hrs)	2 Credits
		Any 10 Credits

A certificate of Completion for each activity shall be issued by the HOD/ Faculty Coordinator or Principal of the college needs to be submitted to the Programme Committee

i) **Credits**

A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

j) **Registration**

After completion of admission process, every student needs to register for the set of courses that he/she plans to take up in each semester from among those denoted by the Department.

k) **Introduction of Courses**

- The CBCS pattern is applicable to all full-time PG Geography programme approved by the Academic Council.
- Teaching, learning and evaluation shall follow Semester pattern.
- Candidates who have passed any bachelor Degree Examinations of Pondicherry University or any other Universities are eligible for admission to the course, provided they have secured a minimum of 55% marks in the optional subjects (50% for SC Candidates).
- Prescribed M.Sc. Geography programme consists of four consecutive semesters (two years).
- The academic year consists of two consecutive (one odd +one even) semesters.
- The medium of instruction for all the courses shall be English.

l) **Pattern of Examination**

The theory exam will be conducted for a total 60 Marks. It will consist of 3 Parts, namely, Short, Medium and Long answer questions.

Part – A: Each question carries 3 marks and students has to answer 5 questions (5X3=15)

Part – B: Each question carries 5 marks and students has to answer 3 questions (3X5=15)

Part – C: Each question carries 15 marks and students has to answer 2 questions (2X15=30)

m) **Supplementary Examination**

- A failed student who meets the attendance requirement may be permitted to register for the next end-semester examination in the following semester itself.
- Students who have failed due to insufficient attendance and /or less than 40% Internal Assessment marks should repeat the course as and when offered.

n) **Grading and Grade Card**

The UGC recommended a 10-point grading system with the following letter grades will be followed:

Letter grade		Grade point
O	(Outstanding)	10
A+	(Excellent)	9
A	(Very good)	8
B+	(Good)	7
B	(Above average)	6
C	(Average)	5
P	(Pass)	4
F	(Fail)	0
Ab	(Absent)	0

(i) A student obtaining Grade F shall be considered failed and will be required to reappear in the examination.

(ii) For non-audit courses 'Satisfactory' or "Unsatisfactory' shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

(iii) The Universities can decide on the grade or percentage of marks required to pass in a course and also the CGPA required to qualify for a degree taking into consideration the recommendations of the statutory professional councils such as AICTE, MCI, BCI, NCTE etc.,

(iv) The statutory requirement for eligibility to enter as assistant professor in colleges and universities in the disciplines of arts, science, commerce etc., is a minimum average mark of 50% and 55% in relevant postgraduate degree respectively for reserved and general category. Hence, it is recommended that the cut-off marks for grade B shall not be less than 50% and for grade B+, it should not be less than 55% under the absolute grading system. Similarly, cut-off marks shall be fixed for grade B and B+ based on the recommendation of the statutory bodies (AICTE, NCTE etc.,) of the relevant disciplines.

o) **Computation of SGPA and CGPA**

The UGC recommended procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be used:

i) The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

SGPA $(Si) = \sum(C_i \, XG_i)/\sum C_i$

where, C_i is the number of credits of the i^{th} course and G is the grade point scored by the student in the i^{th} course.

ii) The CGPA is also calculated in the same manner taking into account all the coursesundergone by a student over all the semesters of a programme, i.e.

CGPA $= \sum(C_i \, X \, S_i)/\sum C_i$

where S_i is the SGPA of the i^{th} semester and C_i is the total number of credits in thatsemester.

p) **Illustration of Computation of SGPA and CGPA and format for Transcripts**

(i) Computation of SGPA and CGPA

Illustration for SGPA

Course	Credit	Grade letter	Grade point	Credit point (Credit X Grade point)
Course 1	3	A	8	3 X 8 = 24
Course 2	4	B+	7	4 X 7 = 38
Course 3	3	B	6	3 X 6 = 18
Course 4	3	O	10	3 X 10 = 30
Course 5	3	C	5	3 X 5 = 15
Course 6	4	B	6	4 X 6 = 24
	20			139

Thus, **SGPA = 139/20**
= 6.95

Illustration for CGPA

	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6
Credit	20	22	25	26	26	25
SGPA	6.9	7.8	5.6	6.0	6.3	8.0

Thus, **CGPA** = $\frac{20 \times 6.9 + 22 \times 7.8 + 25 \times 5.6 + 26 \times 6.0 + 26 \times 6.3 + 25 \times 8.0}{144}$

= 6.73

(ii) Transcript Format

Based on the above recommendations on Letter grades, grade points and SGPA and CCPA, the transcript for each semester and aconsolidated transcript indicating the performance in all semesters will be issued.

16/4/2024

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Course design for M.Sc. Geography (Choice Based Credit System)

PG Programme
Total Hard Core = 48 Credit
Total Soft Core = 24 Credit
Total = 72 Credit

I st Semester	II nd Semester	III rd Semester	IV th Semester
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6	Completion of any one/two MOOCS/ SWAYAM Courses (30 hrs)	2 Credits
		Any 10 Credits

A certificate of Completion for each activity shall be issued by the HOD/ Faculty Coordinator or Principal of the college needs to be submitted to the Programme Committee

Course Structure of Two year M.Sc. Geography

I[st] Semester (Audit Courses)

Sl. No.	Course Code	Course Title	Nature	No. of Credit
1	PGGEO 411	Advance Geomorphology	**Hard Core**	**4**
2	PGGEO 412	Geography of Resources	**Hard Core**	**4**
3	PGGEO 413	Emerging Geographical Thoughts	**Hard Core**	**4**
4	PGGEO 414	Bio-geography (Plant Geography)	**Hard Core**	**3**
5	PGGEO 415	Oceanography	**Hard Core**	**3**
6	PGGEO 416	Quantitative Techniques in Geography	**Soft Core (Lab Work)**	**2**
				20 Credits

Winter Project I – 15 days (Non Audit Course)

II[nd] Semester (Audit Courses)

Sl. No.	Course Code	Course Title	Nature	No. of Credit
1	PGGEO 421	Advance Climatology	**Hard Core**	**4**
2	PGGEO 422	Population Geography	**Hard Core**	**4**
3	PGGEO 423	Fundamentals of Cartography	**Hard Core**	**4**
4	PGGEO 424	Cultural Geography	**Hard Core**	**3**
5	PGGEO 425	GIS and Remote Sensing	**Hard Core**	**3**
6	PGGEO 426	Interpretation of Topographical Maps	**Soft Core (Lab Work)**	**2**
				20 Credits

Summer Project – 45 days (Non Audit Course)

III[rd] Semester (Audit Courses)

Sl. No.	Course Code	Course Title	Nature	No. of Credit
1	PGGEO 511	Urban Geography	**Hard Core**	**3**
2	PGGEO 512	Research Methodology	**Hard Core**	**3**
	Soft Core			
3	Compulsory		**Soft Core** – 1	**3**
4	Compulsory		**Soft Core** – 2	**3**
5	Elective		**Soft Core** – 3	**2**
6	Elective		**Soft Core – (Lab Work)**	**2**
				16 Credits

Winter Project II – 15 days (Non Audit Course)

IV[th] Semester (Audit Courses)

Sl. No.	Course Code	Course Title	Nature	No. of Credit
1	PGGEO 521	Regional Planning & Development	**Hard Core**	**3**
2	PGGEO 522	Agricultural Geography	**Hard Core**	**3**
	Soft Core			
3	Compulsory		**Soft Core** – 4	**3**
4	Compulsory		**Soft Core** – 5	**3**
5	Elective		**Soft Core** – 6	**2**
6	Elective		**Soft Core – (Lab Work)**	**2**
				16 Credits

Hard Core = 48 Credits; Soft Core = 24 Credits; Total = 72 Credits

LIST OF ELECTIVE STREAMS
(Two Soft Cores are Compulsory)
Students can choose any two elective soft cores each from any four sets

ELECTIVE STREAM – 1

Sl. No.	Course Code	Course Title	Nature	No. of Credits
1	PGGEO 531	Geo Surveying – I **(COMPULSORY)**	**Soft Core Paper-1**	**3**
2	PGGEO 532	Field Study Tour & Viva **(COMPULSORY)**	**Soft Core Paper-2**	**3**
3	PGGEO 533	Techniques in Physical Geography –I **(ELECTIVE)**	**Soft Core Paper-3**	**2**
4	PGGEO 534	Interpretation of Indian Weather Maps **(ELECTIVE)**	**Soft Core Paper-4**	**2**
5	PGGEO 535	Cartographic Appreciation and Representation of Data **(ELECTIVE)**	**Soft Core Paper-5**	**2**
6	PGGEO 536	Statistical Methods in Geography – I **(ELECTIVE)**	**Soft Core Paper-6**	**2**
7	PGGEO 537	Analysis of Climatic Data – I **(ELECTIVE)**	**Soft Core Paper-7**	**2**
8	PGGEO 538	Practical in Population Geography **(ELECTIVE)**	**Soft Core Paper-8**	**2**

ELECTIVE STREAM – 2

Sl. No.	Course Code	Course Title	Nature	No. of Credits
1	PGGEO 541	Internship Training Report and Viva Voce **(COMPULSORY)**	**Soft Core Paper-1**	**3**
2	PGGEO 542	Dissertation **(COMPULSORY)**	**Soft Core Paper-2**	**3**
3	PGGEO 543	Practical in Geography of Development **(ELECTIVE)**	**Soft Core Paper-3**	**2**
4	PGGEO 544	Practical in Geography of Population Resource **(ELECTIVE)**	**Soft Core Paper-4**	**2**
5	PGGEO 545	Geography for All **(ELECTIVE)**	**Soft Core Paper-5**	**2**
6	PGGEO 546	Fundamentals of GIS **(ELECTIVE)**	**Soft Core Paper-6**	**2**
7	PGGEO 547	Land Measurement and Division **(ELECTIVE)**	**Soft Core Paper-7**	**2**
8	PGGEO 548	Study of Topo Maps – (Indian Atlas) **(ELECTIVE)**	**Soft Core Paper-8**	**2**

ELECTIVE STREAM – 3

Sl. No.	Course Code	Course Title	Nature	No. of Credits
1	PGGEO 551	Geo Surveying – II **(COMPULSORY)**	**Soft Core Paper-1**	**3**
2	PGGEO 552	Socio-Economic Field Survey **(COMPULSORY)**	**Soft Core Paper-2**	**3**
3	PGGEO 553	Techniques in Physical Geography – II **(ELECTIVE)**	**Soft Core Paper-3**	**2**
4	PGGEO 554	Study of Topo Maps – (Indian Atlas) **(ELECTIVE)**	**Soft Core Paper-4**	**2**
5	PGGEO 555	Techniques of Mapping and Analysis **(ELECTIVE)**	**Soft Core Paper-5**	**2**
6	PGGEO 556	Statistical Methods in Geography – II **(ELECTIVE)**	**Soft Core Paper-6**	**2**
7	PGGEO 557	Practical in Physical Geography **(ELECTIVE)**	**Soft Core Paper-7**	**2**
8	PGGEO 558	Practical in Geography of Tourism **(ELECTIVE)**	**Soft Core Paper-8**	**2**

ELECTIVE STREAM – 4

Sl. No.	Course Code	Course Title	Nature	No. of Credits
1	PGGEO 561	Geography for All **(COMPULSORY)**	**Soft Core Paper-1**	**3**
2	PGGEO 562	Project and Viva **(COMPULSORY)**	**Soft Core Paper-2**	**3**
3	PGGEO 563	Practical in Human Geography **(ELECTIVE)**	**Soft Core Paper-3**	**2**
4	PGGEO 564	Practical in Rural Settlements **(ELECTIVE)**	**Soft Core Paper-4**	**2**
5	PGGEO 565	Fundamentals of GIS **(ELECTIVE)**	**Soft Core Paper-5**	**2**
6	PGGEO 566	Analysis of Socio Economic Data **(ELECTIVE)**	**Soft Core Paper-6**	**2**
7	PGGEO 567	Interpretation of Aerial Photography and Satellite Images **(ELECTIVE)**	**Soft Core Paper-7**	**2**
8	PGGEO 568	Assignment Based Seminar **(ELECTIVE)**	**Soft Core Paper-8**	**2**

In each stream students shall choose any 2 (Two) soft course out of 6 (Six) Soft course subject (Elective)

M.Sc. Geography

(Choice Based Credit system)

Proposed Scheme of Course Pattern for M.Sc. Geography as per

Choice Based Credit System to be implemented by

2021-22 by Pondicherry University

M.SC. GEOGRAPHY Ist SEMESTER

Paper Code	Title of the Paper	Type	Inst. Hours Per Week	Total No. of Hours	Duration of Exam	IA Marks	Exam Marks	Total Marks	Credits
Semester-I									
Hard Core									
PGGEO 411	Advance Geomorphology	*Theory	4	60	3	40	60	100	4
PGGEO 412	Geography of Resources	*Theory	4	60	3	40	60	100	4
PGGEO 413	Emerging Geographical Thoughts	*Theory	4	60	3	40	60	100	4
PGGEO 414	Biogeography (Plant Geography)	*Theory	3	45	3	40	60	100	3
PGGEO 415	Oceanography	*Theory	3	45	3	40	60	100	3
Soft Core									
PGGEO 416	Quantitative Tech. in Geography	**Lab Work	2	24	3	-	-	100**	2

Ist Semester

Hard Core – 18 Credits
Soft Core – 02 Credits
Total = 20 Credits

***Each theory course shall have the following breakup of Internal Assessment marks**

- Internal Assessment Test (Two) 2X15 = 15 + 15 Marks
- Seminar/ Assignment / Presentation/ Viva and Attendance = 5 + 5 Marks

Total = 40 Marks

****The breakup of marks for lab work should be distributed against Lab Record, Practical Exam and Viva in the ratio of 40: 40: 20.**

M.Sc. GEOGRAPHY IInd SEMESTER

Paper Code	Title of the Paper	Type	Inst. Hour Per Week	Total No. of Hours	Duration of Exam	IA* Marks	Exam Marks	Total Marks	Credits
Semester-II									
Hard Core									
PGGEO 421	Advance Climatology	*Theory	4	60s	3	40	60	100	4
PGGEO 422	Population Geography	*Theory	4	60	3	40	60	100	4
PGGEO 423	Fundamental of Cartography	*Theory	4	60	3	40	60	100	4
PGGEO 424	Cultural Geography	*Theory	3	45	3	40	60	100	3
PGGEO 425	GIS and Remote Sensing	*Theory	3	45	3	40	60	100	3
Soft Core									
PGGEO 426	Interp. of Topographical Maps.	**Lab Work	2	24	3	-	-	100**	2

IInd Semester

Hard Core – 18 Credits
Soft Core – 02 Credits
Total = 20 Credits

***Each theory course shall have the following breakup of internal assessment marks**

- Internal Assessment Test (Two) 2X15 = 15 + 15 Marks
- Seminar/ Assignment / Presentation/ Viva and Attendance = 5 + 5 Marks

Total = 40 Marks

****The breakup of marks for lab work should be distributed against Lab Record, Practical Exam and Viva in the ratio of 40: 40: 20.**

M.SC. GEOGRAPHY III[rd] SEMESTER

Paper Code	Title of the Paper	Type	Inst. Hours Per Week	Total No. of Hours	Duration of Exam	IA Marks	Exam Marks	Total Marks	Credits
Semester-III									
Hard Core									
PGGEO 511	Urban Geography	*Theory	3	45	3	40	60	100	3
PGGEO 512	Research Methodology	*Theory	3	45	3	40	60	100	3
Soft Core	**(Choose Any One Set from Set I-IV)#**								
Soft Core – 1	Compulsory	*** Practical / Lab Work	3	24	3	40	60	100***	3
Soft Core – 2	Compulsory	*** Practical / Lab Work	2	24	3	-	-	100***	3
Soft Core – 3	Elective	** Practical / Lab Work	2	24	3	-	-	100**	2
Soft Core – 4	Elective	** Practical / Lab Work	2	24	3	-	-	100**	2

III[rd] Semester

Hard Core – 06 Credits
Soft Core – 10 Credits
Total = 16 Credits

***Each theory course shall have the following breakup of Internal Assessment marks**

- Internal Assessment Test (Two) 2X15 = 15 + 15 Marks
- Seminar/ Assignment / Presentation/ Viva and Attendance = 5 + 5 Marks

Total = 40 Marks

****The breakup of marks for lab work should be distributed against Lab Record, Practical Exam and Viva in the ratio of 40: 40: 20.**

*****The breakup of marks for project & viva-voce should be project report and viva in the ratio of 70:30**

Students have to study any four (4) soft core from any one Set from Set I-IV

M.Sc. GEOGRAPHY- IVth SEMESTER

Paper Code	Title of the Paper	Type	Inst. Hour Per Week	Total No. of Hours	Duration of Exam	IA* Marks	Exam Marks	Total Marks	Credits
Semester-IV									
Hard Core									
PGGEO 521	Regional Planning & Development	*Theory	3	45	3	40	60	100	3
PGGEO 522	Agricultural Geography	*Theory	3	45	3	40	60	100	3
Soft Core	**(Choose Any One Set from Set I-IV)#**								
Soft Core – 5	Compulsory	*** Practical / Lab Work	2	24	3			100***	3
Soft Core – 6	Compulsory	*** Practical / Lab Work	2	24	3			100***	3
Soft Core – 7	Elective	** Practical / Lab Work	2	24	3			100**	2
Soft Core – 8	Elective	** Practical / Lab Work	2	24	3			100**	2

IVth Semester

Hard Core – 06 Credits
Soft Core – 10 Credits
Total = 16 Credits

***Each theory course shall have the following breakup of internal assessment marks**

- Internal Assessment Test (Two) 2X15 = 15 + 15 Marks
- Seminar/ Assignment / Presentation/ Viva and Attendance = 5 + 5 Marks

Total = 40 Marks

****The breakup of marks for lab work should be distributed against Lab Record, Practical Exam and Viva in the ratio of 40: 40: 20.**

*****The breakup of marks for project & viva-voce should be project report and viva in the ratio of 70:30**

Students have to study any four (4) soft core from any one Set from Set I-IV

Semester	Hard Core	Soft Core	Total Credits
I	18	02	20
II	18	02	20
III	06	10	16
IV	06	10	16
Total	**48**	**24**	**72**

Chairperson
Board of Studies in Geography
(Pondicherry University)
JNRM

Detailed Syllabus for
M.Sc. Geography (CBCS) for 2 years course of 72 Credits

M.Sc. GEOGRAPHY – Ist SEMESTER

ADVANCE GEOMORPHOLOGY **60 hrs**

PGGEO 411 **4 Credits**

(THEORY- HARD CORE) **100 Marks**

UNIT I

Geomorphology: Origin and evolution of the earth's crust; Fundamental Concepts of Geomorphology. Interior of the Earth: Structure and convectional currents. Theory of Isostacy: Views of Pratt and Aries. Geological-time-scale.

UNIT II

Theory of Plate Tectonics and Sea Floor Spreading, Geosynclines; Wegener's Theory of Continental drift. Earth Movements: Orogenic, Epirogenic Movements and Resultant landforms: Folds and Faults and their types. Rocks and its types. Volcanoes: reasons, types of eruptions, significance, volcanic activity, products, landforms, geographical distribution and major volcanic eruptions occurred. Earthquakes: Causes, measuring earthquake, landforms, geographical distribution and key earthquakes so far. Tsunamis: Causes, consequences and major tsunamis taken places. Recent views on mountain-building.

UNIT III

Process of Weathering and Mass Wasting, Landforms Produced by – Drainage system and drainage patterns. Glaciers, Wind, Underground water and Sea Waves: process of these and land forms produced.

UNIT IV

Slope development; Factors controlling landforms development; Critical Study of the Concept of Cycle of Erosion–W.M. Davis and W. Penck– Recent Trends in Geomorphology.

References:

1. Ahmed, E. (1985) *Geomorphology*. Kalyani Publishers, New Delhi.
2. Bloom, A.L. (1978) *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms.* Prentice – Hall of India, New Delhi.
3. Bradshaw, M.J. et. al. (1979) *The Earth's Changing Surface*. Hodder & Stonghton, London.
4. Brunsden, D. (1985) *Geomorphology in the Service of Man: The Future of Geography*. Methuen, London.
5. Dayal, P. (1995) *A Text Book of Geomorphology*. 2nd Edition. Shukla Book/Dept, Patna.
6. Goudie, Andrew et.al. (1981) *Geomorphological Techniques*. George Allen &Unwin, London.
7. Holmes, A. (1965) *Principles of Physical Geology*. 3rd Edition, ELBSS Edition.
8. Steers, J.A. (1932) *The Unstable Earth*. Methuen, London.
9. Strahler, A.N. (1968) *The Earth Sciences*. Harper & Row International Edition, New York.
10. Thornbury, W.D. (1969) *Principles of Geomorphology* 2nd Edition. Wiley International Edition. & Wiley Eastern Reprints.

11. Verstappen, H. (1983) *Applied Geomorphology, Geomorphological Surveys for Environmental Development*, Elsevier, Amsterdam
12. Woodridge, S.W and R.S. Morgan (1991) *An Outline of Geomorphology, The Physical Basis of Geography*. Orient Longman, Kolkata.
13. Worcester, P.G. (1965) *A Text Book of Geomorphology* (2nd Edition). Can North East West Edition, New Delhi.

M.Sc. GEOGRAPHY – Ist SEMESTER

GEOGRAPHY OF RESOURCE **60 hrs**

PGGEO 412 **4 Credits**

(THEORY- HARD CORE) **100 Marks**

UNIT I

Introduction and Bases. Concept and scope of Resource Geography; Resource: concept and types; World resources: distribution and pattern; Land, water, mineral and power resources; Nonconventional sources of energy; Human resources; Resource base and its dynamism as related to stages of cultural, technological and economic development.

UNIT II

Resource Use. The limits to growth; Resource scarcity hypothesis; World energy crisis; Resource conservation and management; Watershed management; Sustainable development; Resources, development and international politics.

UNIT III

Theories of Resource Use. Theories of agricultural location; Theories of industrial location: Weber, Hoover, and Losch; Trade blocs.

UNIT IV

Regional Perspectives. Resource regionalisation; World economic development; Concept of developed and developing nations; Concepts of North-South and First, Second, Third and Fourth Worlds.

References:

1. Burton, I. and Kates, R.W. (1978) *Readings in Resource Management and Conservation*. McGraw Hills, New York.
2. Clark, G. L., Feldman, M.P. and Gertler, M.S. (eds.) (2000) *The Oxford Handbook of Economic Geography*. Oxford University Press, Oxford and New York.
3. Ehrlich, P.R., Ehrlich, R.H. and Holdren, J.P. (1998) *Ecoscience: Population, Resources and Development* (2nd Edition). Freeman and Company, San Francisco.
4. McCarty, H.M. & James, B.L. (1976) *A Preface to Economic Geography*. Prentice Hall, New Jersey.
5. Mitra, A. (2000) *Resource Studies*. Shridhar Publishers, Kolkata.
6. Ramesh, A. (ed.) (1984) *Resource Geography*. Heritage Publishers, New Delhi.
7. Sheppard, E. and Treror, I. B. (ed.) (2003) *A Companion to Economic Geography*. Blackwell Publication, U.K. and USA.
8. Singh, J. (2000) *Sansadhan Bhoogol.* Gyanodaya Prakashan, Gorakhpur.
9. Singh, K.N. and Singh, J. (2003) *Arthik Bhoogol Ke Mool Tatva.* Gyanodaya Prakashan, Gorakhpur.
10. Todaro, M.P. & Smith, S.C. (2004) *Economic Development*. Pearson Education Private Limited, Singapore.

M.Sc. GEOGRAPHY – Ist SEMESTER

EMERGING GEOGRAPHICAL THOUGHT **60 hrs**

PGGEO 413 **4 Credits**

(THEORY- HARD CORE) **100 Marks**

UNIT I

The Field of Geography: Definition, meaning nature and scope of geography. Geography as a Social and Natural Science. Evaluation of Geographic Thought. Limits in Geography. Traditions in Geography; Areal Differentiation, landscape theme, Environment Theme. Spatial Distribution and Geometric theme. Inter-disciplinary and Intra disciplinary approaches in Geography.

UNIT II

Pioneers and their Contributions to Geography: Ancient period – Greek, Romans, Indians and Chines, medieval period-Arabs and geographical Discoveries. Modern Period-Alexander Von Humbolt, Carl Ritter and Darwin. School of geography-Germen, French, British, American and Russian. Foundation of modern Geography.

UNIT III

Dualism and Dichtomies in geography-Determinism, Possibilism, Neo-Determinism and Social Determinism. Quantitative Revolution. Geographical Paradigms. Areal differentiation, regional synthesis and spatial organization.

UNIT IV

Explanations in Geography-Cognitive, cause & effect, temporal & Functional, Systems Analysis and regional Concepts. Modern themes in Geographical Thought-Positivism, pragmatism, Functionalism, Existentialism, Idealism, Realism, Marxism, Radicalism, Behaviouralism & Humanism. Quantitative revolution and locational analysis.

References:

1. Adhikari, S. (2004). *Fundamentals of Geographic Thought*. Concept Publishing Company, New Delhi.
2. Dikshit, R.D. (1997). *Geographical Thought: A Contextual History of Ideas*. Prentice Hall of India, New Delhi.
3. Frazire, J.W. (1982). *Applied Geography*. Prentice Hall. New Delhi.
4. Haggett, Peter (1972). *Geography: A Modern Synthesis*. Harper & Row. New York.
5. Harvey, David (2000). *Explanations in Geography*. Macmillan, New York.
6. Harvey, M.E (2002). *Themes in Geographical Thought*. R.K Publishers, New Delhi
7. Hussain, Majid (2001). *Evolution of Geographic Thought.* Rawat Publications, New Delhi.
8. Singh, I (2006). *Diverse Aspect of Geographical Thought*. ALFA Publications New Delhi.

M.Sc. GEOGRAPHY – Ist SEMESTER

BIO-GEOGRAPHY (PLANT GEOGRAPHY) **45 hrs**

PGGEO 414 **3 Credits**

(THEORY- HARD CORE) **100 Marks**

UNIT I

Plant Geography: scope and development

UNIT II

Functioning and development of ecosystem; Evolution of plants

UNIT III

Plants and their classification: taxonomic, ecological and climatic; Plants and their environment; Plants and atmospheric factors; Plants and edaphic factors

UNIT IV

Major biomes of the world: forests, grasslands and deserts

References:

1. Mathur, H. S. (2003). *Essentials of Biogeography*. Pointer Publishers, Jaipur.
2. Pears, N. (1977). *Basic Biogeography*. Longman Group, London.
3. Robinson, H. (1972). *Biogeography*. MacDonald and Evans, London.
4. Seddon, B. A. (1971). *Introduction to Biogeography*. Gerald Duckworth and Co., London.
5. Tivy, J. (1993). *Introduction to Biogeography*. Gerald Duckworth and Co.

M.Sc. GEOGRAPHY – Ist SEMESTER

OCEANOGRAPHY **45 hrs**

PGGEO 415 **3 Credits**

(THEORY- HARD CORE) **100 Marks**

UNIT I

Nature, scope and development of Oceanography. Major features of the Ocean Basins: Continental self, Continental slope, abyssal plains and ocean deep. Submarine canyons. Oceanic Ridges. Bottom relief of Indian, Pacific and Atlantic oceans.

UNIT II

Temperature, Salinity and Density of oceans and seas. Ocean currents of Indian, Pacific and Atlantic oceans. Waves and tides: types and theories.

UNIT III

Marine deposits: Types and Distribution. Coral reef: types and theories of formation (Darwin, Davis and Daly).

References:

1. Garrison, T. (1994) *Oceanography*. Wadsworth Publishing Co. Belmont.
2. King, C.A.M. (1976) *Oceanography for Geographers*. Edward Arnold, London
3. Pinet, R. (1998) *Invitation to Oceanography*. Jones and Bartlett Publishers, London.
4. Sharma, T.C and Vatal, M. (1999) *Oceanography for Geographers*. Chaitanya Publishing House, Allahabad.

M.Sc. GEOGRAPHY – Ist SEMESTER

QUANTITATIVE TECHNIQUES IN GEOGRAPHY **24 hrs**

PGGEO 416 **2 Credits**

(SOFT CORE-LAB WORK) **100 Marks**

S. No.	Topics
1.	Measures of Central Tendency: Mean, Median and Mode – (5 Exercises)
2.	Mean Centre, Median Centre. (grouped and ungrouped) – (5 Exercises)
3.	Measures of Dispersion: Mean Deviation, Quartiles deviation, standard deviation – (5 Exercises)
4.	Variance: Co-efficient of variability. Lorenz Curve. Standard distance. Nearest neighbours analysis – (5 Exercises)

References:

1. Gregory, S (1973) *Statistical Methods and the Geographer*. Longman, London.
2. Hammond, R and Mc Cullough, P (1974) *Quantitative Techniques in Geography*. Clarendon Press, Oxford.
3. Mahmood, Aslam (1998) *Statistical Methods in Geographical Studies*. Rajesh Publishers, New Delhi
4. Monkhouse, F.J and H.R. Wilkinson (1971) *Maps and Diagrams: Their Compilations and Concentration*. Methuen, London.
5. Toyne, P and Newby, P.T. (1977) *Techniques in Human Geography*. Macmillan, London.

M.Sc. GEOGRAPHY –IInd SEMESTER

ADVANCED CLIMATOLOGY **60 hrs**

PGGEO 421 **4 Credits**

(THEORY- HARD CORE) **100 Marks**

UNIT I

Nature, scope and Development of Climatology. Meteorology and climatology. Composition and structure of the atmosphere. Insolation. Heat and energy transfer. Heating and cooling of the atmosphere. Differential heating and cooling of land and water bodies. Heat budget. Factors affecting horizontal distribution of temperature. Horizontal distribution of temperature. Inversion of temperature.

UNIT II

Horizontal, vertical and seasonal distribution of pressure. Factors affecting wind velocity and direction. Geostrophic and gradient wind. Beaufort scale of wind velocity measurement. General circulation of the atmosphere. Primary, secondary and tertiary (local) winds. Latitudinal shifting of wind belts. Jet stream heat and moisture transfer.

UNIT III

Types of humidity, potential and actual evapotranspiration. Adiabatic process and temperature change. Different lapse rates. Atmospheric equilibrium. Condensation process. Forms of condensation including clouds and fogs and their types. Forms types and distribution of precipitation.

UNIT IV

Definition, source regions and types of air masses. Temperate cyclones. Tropical disturbances: tropical cyclones (origin, characteristics and associated weather). Easterly waves, tornadoes and water spouts.

References:

1. Aoade, (1978) *Climatology for the Tropics*. John Wiley and Sons, New York.
2. Barry, R.G and Chorley, R.J (1993) *Atmosphere, Weather and Climate*. Routledge, London.
3. Critchfield. H.J (1996) *General Climatology*. Prentice Hall of India, New Delhi.
4. Lal, D.S (2002) *Climatology*. Chaitanya Publisher House Allahabad.
5. Ramney, R.G (1970) *Climatology*. McMillan, London.
6. Stringer, E.P (1982) *Foundations of Climatology*. Surjeet Publications, New Delhi.

M.Sc GEOGRAPHY – IInd SEMESTER

POPULATION GEOGRAPHY **60 hrs**

PGGEO 422 **4 Credits**

(THEORY- HARD CORE) **100 Marks**

UNIT I

Population geography, Nature, Scope and Development. Population geography and demography. Source of population data and their reliability problems of mapping population data.

UNIT II

Population distribution, density and growth. Determinants and world patterns of the above. Theories of population: Malthus, Karl Marx and Spencer. Concept of under population and overpopulation.

UNIT III

Population Composition: age, sex structure, literacy and education, religion and race, rural and urban; urbanization and associated problems; gender issues.

UNIT IV

Population dynamics: Measurement of fertility and mortality. Migration national and international. Theories of migration: Ravenstein, and Lee. Human Development index and its components. Population policy in development and less developed countries including India. Population and environment; implications for the future.

References:

1. Chandra, R.C (2001) *Geography of Population*. Kalyani Publisher, New Delhi.
2. Clarke, J.I (1981) *Population Geography*. Pergamon Press, Oxford.
3. Demko, G. J et al., (1970) *Population Geography*. McGraw Hill Inc., New York.
4. Henry, I. (1976) *Population*. Edward Arnold, London.
5. Hornby, W.P and Jones, M (1983). *An Introduction to Population Geography*. Cambridge University Press. London.
6. Woods, R (1979) *Population Analysis in Geography*. Longman, London.
7. Zelinsky, W (1976) *A Prologue to Population Geography*. Prentice Hall, New York.

M.Sc. GEOGRAPHY –IInd SEMESTER

FUNDAMENTALS OF CARTOGRAPHY **60 hrs**

PGGEO 423 **4 Credits**

(THEORY-HARD CORE) **100 Marks**

UNIT I

Nature and scope of Cartography. Cartography as a science of human communication. Art and Science in Cartography. Meaning and types of maps. Major divisions in cartography.

UNIT II

Development of cartography: Ancient period, medieval period and modern period. Rise of thematic cartography. Development of cartography in India.

UNIT III

Map making process: Collection of map data. Remote Sensing (including aerial photographs) as source of data. Selection of details. Elements of generalization: Simplification; classification, data manipulations. Controls of generalization. Map symbolisation: Mapping qualitative and quantitative data using point, line, area symbols (No Particles Exercise). Thematic mapping: Types and problems.

UNIT IV

Map design and layout: Graphic design in map making. Map design in relation to arts. Graphic elements of map design. Constraints in map design. Map format. Colours and patterns: phenomenon of colours. System of colour identification. Use of colours in maps. Use of patterns.

References:

1. Crone, G.R (1968) *Maps and their Makers*. Hutchinson University Library, London.
2. Keates, J.S (1976) *Cartographic Design and Production*. Longman, London.
3. Misra, R.P (1989) *Fundamentals of Cartography*. Concepts Publishing House, New Delhi.
4. Raisz, E (1948) *General Cartography.* Mc Graw Hill Inc., New York.
5. Raisz, E (1962) *Principles of Cartography*. Mc Graw Hill Inc., New York.
6. Robinson, A.H. et al (1985) *Elements of Cartography*. John Wiley and Sons, New York.

M.Sc. GEOGRAPHY –IInd SEMESTER

CULTURAL GEOGRAPHY **45 hrs**

PGGEO 424 **3 Credits**

(THEORY-HARD CORE) **100 Marks**

UNIT I

Nature and scope of culture Geography; Concept of culture and cultural area; Elements of culture, Convergence and Divergence of culture; Cultural change. Cultural Diversity: emergence of man; Cultural Revolution of man.

UNIT II

Human Races; Caucasoid, Mongoloids and Negroids; Worlds major region; India's Cultural regions. Major cultural realms of the world; Dwelling places as cultural expressions. Ethnic Groups, Case study, Bushman, Pygmies and Eskimos; theories of tribal groups; tribal areas and their problems; Tribals of India; Economy and society of tribal groups (Tribes of Andaman and Nicobar Islands)

UNIT III

India's Cultural setting: Historical perspective of Indian Society. Racial, Linguistic and ethnic diversities; religious minorities; work-force dependency ratio, longevity; Inter-regional, Intra-regional and international migration and associated problems; Population problems and policy; Health indicators.

References:

1. Hussain, Majid. (1999) *Human Geography* (2nd Edition). Rawat Publication, Jaipur.
2. Robestein, J.H & Robert S. Barren (1990) *The Cultural Landscape: An Introduction to Human Geography*. Prentice Hall of India Pvt. Ltd. New Delhi.
3. Singh R.Y (2003). *Geography of Settlements*. Rawat Publication, Jaipur and New Delhi.
4. Tirtha, Ranjit (2002) *Geography of India* (2nd Edition). Rawat Publication, Jaipur
5. www.fortunecity.com/victorian/updike/188.culture.html
6. www.utexas.edu/depts/grg/snders/GRG305/industrialgeography. html

M.Sc. GEOGRAPHY –IInd SEMESTER

GEOGRAPHIC INFORMATION SYSTEM AND REMOTE SENSING **45 hrs**

PGGEO 425 **3 Credits**

(THEORY-HARD CORE) **100 Marks**

UNIT I

Fundamentals: Electromagnetic radiation (EMR). Atmosphere window Energy Interaction in atmosphere and earth surface features. Remote Sensing System Ideal and real Remote sensing. Platforms.

UNIT II

Satellite Remote Sensing: Types of Satellite. Development Resolution: Spatial Spectral, Radiometric and temporal. Satellite Programmes Landsat, SPOT, IRS IKONOS. Spectral reflectance curves.

UNIT III

Image Interpretation: Satellite data products: Digitals and visual. Fundamental digital image processing. Ground truth verification. Element of image interpretation. Applications Land use, forestry, water and urban area.

UNIT IV

Geographic Information System (GIS): Fundamentals, development and scope. Spatial data structure. Data base operations. Integration of maps, air photos, satellite data and GIS.

References:

1. Barrett, E.C and Curtis, L.F (1992) *Fundamentals of Remote Sensing and Air Photo Interpretation*. Macmillan, New York
2. Burrough, P.A (1989). *Principles of Geographical Information System for Land Resource Management*. Oxford University Press, Oxford.
3. Curran, P.B (1988). *Principles of Remote Sensing*. Longman, London.
4. Lillisand and Keifer (1994) *Remote Sensing and Image Interpretation*. John Wiley and Sons, New York.
5. Reddy, M. Anji. (2001). *Remote Sensing and Geographic Information System*. B.S. Publication, Hyderabad.
6. Sabins, F.F (1986) *Remote Sensing: Principles and Interpretation*. W.H Freeman and Co., New York.

M.Sc. GEOGRAPHY –IInd SEMESTER

INTERPRETATION OF TOPOGRAPHICAL MAPS **24 hrs**

PGGEO 426 **2 Credits**

(SOFT CORE-LAB WORK) **100 Marks**

Sl. No.	Topics
1	Introduction to SOI toposheet maps; numbering, scales, grid reference, signs and symbols colour system.
2	Study and Interpretation of SOI maps
3	Introduction to OS topographical maps: grid reference sign and symbols and interpretation
4	Introduction to USGS topographical maps: grid reference, sign and symbols and interpretation

References:

1. Dury, G.H (1972) *Map Interpretation*. Pritman and Sons, London
2. Gupta, K.K and Tyagi, V.C. (1992) *Working with Maps*. Survey of India Publication
3. Ramamurthy, K. (1982) *Map Interpretation*. Rex Printer, Madras
4. Singh, R.L. & Kanaujia, L.R.S. (1963) *Map Work & Practical Geography*. Central Book Depot. Allahabad.
5. Tamaskar, B.G. and Deshmukh, V. M. (1974) *Geographical Interpretation of Indian Topographical Maps.* Orient Longman, Kolkata.
6. Vaidyanadhan, R (1968) *Index to a Set of Sixty Topographic Maps: Illustrating Specified Physiographic Features from India*. Council of Scientific and Industrial Research, Ministry of Education, Government of India.

M.Sc. GEOGRAPHY – IIIrd SEMESTER

URBAN GEOGRAPHY **45 hrs**

PGGEO 511 **3 Credits**

(THEORY-HARD CORE) **100 Marks**

UNIT I

Urban Geography: Nature, scope and significance. Different approaches to Urban Geography. Recent trends. Origin and growth of urban centres. Urbanisation in India since 1901.

UNIT II

Urban Centres: Classification based on size and functions and comparative assessment Rank size rule. Urban hierarchy (Christaller's Theory).

UNIT III

Urban Expansion: Vertical and Horizontal urban sprawl, urban fringe, suburban growth and characteristics satellite towns, New towns, Conurbation, metropolis and megalopolis.

UNIT IV

City region Concept. Umland. Urban density gradient. Urban Problems: Slums, Pollution, heat Island, water supply, solid waste and transport.

References:

1. Bose, Ashish (1976) *India's Urbanisation 1901-2001*. Tata Mc Graw Hill Publishing Company, New Delhi.
2. Carter (1979) *The Study of Urban Geography*. Arnold Heinemann, London.
3. Gibbs, J.P (1967). *Urban Research Methods*. Von Nostrand and Co. Inc., Toronto.
4. Johnson, J.H. (1981) *Urban Geography.* Pergaman Press, Oxford.
5. Mayer, H.M. & Kohn, C.F. (eds.) (1959) *Readings in Urban Geography*. University of Chicago Press, Chicago.
6. Northumn. R.K (1975) *Urban Geography*. John Wiley & Sons. Inc. New York

M.Sc. GEOGRAPHY – IIIrd SEMESTER

RESEACRH METHODOLOGY **45 hrs**

PGGEO 512 **3 Credits**

(THEORY-HARD CORE) **100 Marks**

UNIT I

Research: Meaning, definitions, objectives, characteristics. Types, steps involved in research, research ethics, approaches, significance, research and scientific methods, research process, criteria of good research, research problems faced by the researchers in India. Review of literature, need for review of literature.

UNIT II

Methods of data collection; Collection of primary data, observation method, interview method, questionnaire methods, Collection of secondary data, selection of appropriate methods for collection of data, case study method.

UNIT III

Hypothesis, basic concepts concerning testing of hypothesis, limitations of the tests of hypothesis. Interpretation and report writing: significant of report writing, layout of the research report, conclusion, finding and suggestion. Bibliography and reference, field photographs.

References:

1. Clifford, N.J. and G. Valentine (2003). *Key Methods in Geography*. Sage, London.
2. Flowerdew, R. and D. Marlin (2005). *Methods in Human Geography: A Guide for Students doing a Research Project*. Prentice Hall, New York.
3. Gilbert, N (2001). *Researching Social Life*. Sage, London.
4. Leedy, P.D. and J.E Ormrod (2001). *Practical Research: Planning and Design* (7th Edition). Merrill Prentice Hall, New Jersey and SAGE Publications, California.
5. http://computer.org-http://www.acm.org
6. http://www.intute.ac.uk/socialsciences/

M.Sc. GEOGRAPHY- IVth SEMESTER

REGIONAL PLANNING AND DEVELOPMENT **45 hrs**

PGGEO 521 **3 Credits**

(THEORY-HARD CORE) **100 Marks**

UNIT I

Region: Definition, principles and types, regional hierarchy, regionalism Vs sectionalism.

UNIT II

Regional Planning: Concepts, principles, scope, objective and types sectoral and temporal dimensions in regional planning.7 Regional imbalances of growth and development.

UNIT III

Regional development: development, Economic Concepts and theories integrated regional development growth centres and growth pole in regional planning. Theory of market areas.

UNIT IV

Approaches to regional planning: Ecological minimum basic needs, target group and lead sector approaches. Multi-level planning. Decentralized planning. Role of local body governments.

References:

1. Bhat, L.S (1973) *Regional Planning in India*. Statistical Publishing Society, Calcutta.
2. Chand, M and Puri, A.K (1985) *Regional Planning in India*. Allied Publisher, New Delhi.
3. Misra, R.P (1992) *Regional Planning: Concepts, Techniques and Policies*. Concept Publishing Company, New Delhi.
4. Misra, R.P, Sundaram, K.V and Rao, V.L.S.P (eds) (1974) *Regional Development Planning in India*. Vikas Publishing Co., New Delhi.
5. Sundaram, K.V (1985) *Geography and Planning*. Concept Publishing Company, New Delhi.

M.Sc. GEOGRAPHY – IVth SEMESTER

AGRICULTURAL GEOGRAPHY **45 hrs**

PGGEO 522 **3 Credits**

(THEORY-HARD CORE) **100 Marks**

UNIT I

Nature, Scope and significance of agricultural geography; various approaches to the study of agricultural geography.

UNIT II

Origin and dispersal of agriculture; Physical and economic factors affecting agriculture.

UNIT III

Selected agricultural concepts – Crop combination; cropping pattern, crop combination regions (Don's Weaver's and Rafiullah's method), crop efficiency and productivity.

UNIT IV

Von Thunen's Theory of agricultural location and its recent modification.

References:

1. Grigg, D. (1995) *An Introduction of Agricultural Geography*. Routledge, London.
2. Hussain, M. (2000) *Agricultural Geography*. Anmol Publishing, New Delhi.
3. Mamoria C.B. (1998) *Agricultural Problem in India*. Prayag Pustak Bhavan, Allahabad.
4. Negi, B.S (2003) *Indian Agriculture: Problems, Progress and Prospects*. Vikas Publishing, New Delhi.
5. Shafi, Mohammad (2006) *Agricultural Geography*. Dorling Kindersley (India) Pvt. Ltd, New Delhi.
6. Singh, J and Dhillon, S.S (1994) *Agricultural Geography*. Tata McGraw-Hill, New Delhi.
7. Singh, J. (2001) *Agricultural Geography*. Prayag Pustak Bhavan, Allahabad.
8. Symons, L. (1970) *Agricultural Geography*. G. Bell and Sons Ltd, London.

	SOFT CORE		
	ELECTIVE STREAM – 1		
	(CHOOSE ANY TWO)		
CODE			**CREDITS**
PGGEO 531	Geo Surveying – I	**COMPULSORY**	3
PGGEO 532	Field Study Tour & Viva	**COMPULSORY**	3
PGGEO 533	Techniques in Physical Geography –I	**ELECTIVE**	2
PGGEO 534	Interpretation of Indian Weather Maps	**ELECTIVE**	2
PGGEO 535	Cartographic Appreciation and Representation of Data	**ELECTIVE**	2
PGGEO 536	Statistical Methods in Geography – I	**ELECTIVE**	2
PGGEO 537	Analysis of Climatic Data – I	**ELECTIVE**	2
PGGEO 538	Practical in Population Geography	**ELECTIVE**	2

	SOFT CORE		
	ELECTIVE STREAM – 2		
	(CHOOSE ANY TWO)		
CODE			**CREDITS**
PGGEO 541	Internship Training Report and Viva Voce	**COMPULSORY**	3
PGGEO 542	Dissertation	**COMPULSORY**	3
PGGEO 543	Practical in Geography of Development	**ELECTIVE**	2
PGGEO 544	Practical in Geography of Population Resource	**ELECTIVE**	2
PGGEO 545	Geography for All	**ELECTIVE**	2
PGGEO 546	Fundamentals of GIS	**ELECTIVE**	2
PGGEO 547	Land Measurement and Division	**ELECTIVE**	2
PGGEO 548	Study of Topo Maps – (Indian Atlas)	**ELECTIVE**	2

	SOFT CORE		
	ELECTIVE STREAM – 3		
	(CHOOSE ANY TWO)		
CODE			**CREDITS**
PGGEO 551	Geo Surveying – II	**COMPULSORY**	3
PGGEO 552	Socio-Economic Field Survey	**COMPULSORY**	3
PGGEO 553	Techniques in Physical Geography – II	**ELECTIVE**	2
PGGEO 554	Study of Topo Maps – (Indian Atlas)	**ELECTIVE**	2
PGGEO 555	Techniques of Mapping and Analysis	**ELECTIVE**	2
PGGEO 556	Statistical Methods in Geography – II	**ELECTIVE**	2
PGGEO 557	Practical in Physical Geography	**ELECTIVE**	2
PGGEO 558	Practical in Geography of Tourism	**ELECTIVE**	2

	SOFT CORE		
	ELECTIVE STREAM – 4		
	(CHOOSE ANY TWO)		
CODE			**CREDITS**
PGGEO 561	Geography for All	**COMPULSORY**	3
PGGEO 562	Project and Viva	**COMPULSORY**	3
PGGEO 563	Practical in Human Geography	**ELECTIVE**	2
PGGEO 564	Practical in Rural Settlements	**ELECTIVE**	2
PGGEO 565	Fundamentals of GIS	**ELECTIVE**	2
PGGEO 566	Analysis of Socio Economic Data	**ELECTIVE**	2
PGGEO 567	Interpretation of Aerial Photography and Satellite Images	**ELECTIVE**	2
PGGEO 568	Assignment Based Seminar	**ELECTIVE**	2

ELECTIVE STREAM – 1
SOFT CORE (COMPULSORY) **24 hrs**
GEO SURVEYING-I **3 Credits**
PGGEO 531 **100 Marks**

Sl. No.	Topics
1	Surveying-Introduction, Importance and Types
2	Plane Table Survey
3	Prismatic Compass Survey
4	Clinometer
5	Traverse Surveying
6	Contouring

References:

1. Basak, N.N. (1994) *Surveying and Levelling*. Tata McGraw Hill Publishing Company LTD. New Delhi.
2. Davis, Peter (1974) *Science in Geography: Data Description & Presentation* (Volume 3) Oxford University Press, London.
3. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography.* Macmillan, London.
4. Mishra RP. (1973) *Elements of Cartography*. Prasaranga, University of Mysore.
5. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co. London.
6. Robinson, A.H & Sale R.D. (1979) *Elements of Cartography*. John House & Sons, London.
7. Singh, R.L. and Singh, Rana P.B. (2005) *Elements of Practical Geography* (Revised Edition). Kalyani Publishers, New Delhi
8. Singh, R.L. & Kanaujia, L.R.S. (1963) *Map Work & Practical Geography*. Central Book Depot, Allahabad.

ELECTIVE STREAM – 1
SOFT CORE (COMPULSORY)
FIELD STUDY TOUR & VIVA **3 Credits**
PGGEO 532 **100 Marks**

Field study is a part of curricula in M.Sc. IV Semester. Study tour is compulsory and to be conducted between end of the III Semester and in the beginning of the IV Semester for duration of two weeks. Study tour report submission is compulsory. Students are requested to go to the field study tour which is an exploratory topic of geographical importance based on empirical evidences.

The field works on one or two of the following:
Regional survey, rural study, urban study, industrial study and study of geomorphic features in mainland India. The tour report has to be done with the consultation of the staff in charge and has to be submitted to the department at the time of 4th semester examination.

Viva voce based on study tour report would be conducted at the end.

*50 Marks for field study & 50 marks for tour report and viva

References:

1. Ahuja, Ram (2004) *Research Methods*. Rawat Publications, Jaipur and New Delhi.
2. Gopal, M.H. (1970) *Introduction to Research Procedure in Social Science*. Asia Publishing House, Bombay.
3. Kothari, C.R. (1990) *Research Methodology: Methods and Techniques*. New Age International (P) Limited, Publishers, New Delhi.
4. Limb, M. and Dwyer, Claire (eds.) (2001) *Quantitative Methodologies for Geographers: Issues and Debates*. Oxford University Press, Oxford.
5. Mishra, R.P. (1989) *Research Methodology: A Handbook*. Concept Publishing Company, New Delhi.
6. Pal, S.K. (1995): *Computing Mathematical Techniques in Geography*. B.R. Publisher, New Delhi.
7. Young, Pauline V. (1960) *Scientific Social Surveys and Research* (3rd Edition). Prentice Hall, New York.

ELECTIVE STREAM – 1

SOFT CORE (ELECTIVE) **24 hrs**

TECHNIQUES IN PHYSICAL GEOGRAPHY-I **2 Credits**

PGGEO 533 **100 Marks**

Sl. No.	Topics
1	Profile- Definition, Importance and Uses
2	Methods Drawing of Profile; Types of Profiles – Serial, Superimposed, Projected, Composite and Longitudinal Profile
3	Construction of Land forms through Contour – Hill, Plateau, Gorge, Waterfall, Steep & Gentle Slope, V Shaped and U Shaped valley, Cliff, Fiord Coast, Ria Coast, River Terrace, Spur, Terraced Slope, Concave and Convex Slope.

References:

1. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography*. Macmillan, London.
2. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co. London.
3. Mishra, R.P. and Ramesh, A (1968) *Fundamentals of Cartography*. Prasaranga, Mysore.
4. Robinson, A.H., Morrison, J.L., Muehrcke, P.C., Kimerling, A.J., and Guptill, S.C. (1995), *Elements of Cartography*. Wiley, New Jersey.
5. Singh, L.R. (2010) *Fundamentals of Practical Geography.* Sharada Pustak Bhavan, Allahabad.

ELECTIVE STREAM – 1

SOFT CORE (ELECTIVE) **24 hrs**

INTERPRETATION OF INDIAN WEATHER MAP **2 Credits**

PGGEO 534 **100 Marks**

Sl. No.	Topics
1	Components of Indian Daily Weather Maps; Sources of Weather Data IMD
2	Atmospheric Pressure Gradient; Isobar Trends
3	Wind Direction, Wind Rose, Other Weather Phenomena

References:

1. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography*. Macmillan, London.
2. Namowitz, S.N & Stone, Donald B. (1965) *Earth Science: The World We Live* (3rd Edition). Van Nostrand, Princeton
3. Mishra, R.P. (1969) *Fundamentals of Cartography*. Prasaranga, University of Mysore.
4. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
5. Sen, Ashis (1997) *Systematic Practical Geography*. Oriental Longman Ltd., Kolkata.
6. Singh, L.R. (2010) *Fundamentals of Practical Geography.* Sharada Pustak Bhavan, Allahabad.

ELECTIVE STREAM – 1

SOFT CORE (ELECTIVE) 24 hrs

CARTOGRAPHIC APPRECIATION AND REPRESENTATION 2 Credits

PGGEO 535 100 Marks

Sl. No.	Topics
1	Cartographic Appreciation; Representation of data – Proportional symbols
2	Mono Dot Method; Multiple Dot Method
3	Circle, Sphere and Cube Methods
4	Choropleth Method

References:

1. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography*. Macmillan, London.
2. Kraak, Menno-Jan & Ormeling, Ferjan (2003) *Cartography: Visualization of Geospatial Data*, Prentice Hall, New Jersey
3. Mishra, R.P. and Ramesh, A (1968) *Fundamentals of Cartography.* Prasaranga, Mysore.
4. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration.* Methuen & Co., London.
5. Nag, P (1992) *Thematic Cartography and Remote Sensing*. Concept Publishing Company, New Delhi.

ELECTIVE STREAM – 1

SOFT CORE (ELECTIVE)	**24 hrs**
STATISTICAL METHODS IN GEOGRAPHY-I	**2 Credits**
PGGEO 536	**100 Marks**

Sl. No.	Topics
1	Processing of Data: Data Preparation of Frequency Table; Graphical presentation of frequency – Histograms
2	Frequency Polygon and O-give Curves; Co-efficient variation, Quartiles, Deciles and Percentiles – (Ungrouped and Grouped Data)
3	Measures of association: Correlation meaning and methods; Rank Order Correlation; Product movement Correlation

References:

1. Aslam, Mohamed (1977) *Statistical Methods in Geographical Studies*. Rajesh Publications, New Delhi.
2. Gupta, C.B. and Gupta, Vijay (2004). *An Introduction to Statistical Methods* (23rd Revised Edition). Vikas Publishing House, New Delhi.
3. Hammond, R. and McCullagh, Patrick S. (1974) *Quantitative Techniques in Geography: An Introduction*. Oxford University Press, Oxford.
4. Murray, R. Spiegel (1972) *Theory and Problems of Statistics (in SI units)*. MaGraw-Hill Publishing Co., New York.
5. Singh, R.L. and Singh, Rana P.B. (2005) *Elements of Practical Geography* (Revised Edition). Kalyani Publishers, New Delhi.

ELECTIVE STREAM – 1
SOFT CORE (ELECTIVE) **24 hrs**
ANALYSIS OF CLIMATIC DATA-I **2 Credits**
PGGEO 537 **100 Marks**

Sl. No.	Topics
1	Climate and Weather-measurements Units; Diagram of weather and climate instrument
3	Climatic Graphs: Hyther-Graphs; Climographs; Ergo-graph
7	Thermo – Isopleth

References:

1. Sarkar, Ashish (2000) *Practical Geography: A Systematic Approach*. Orient BlackSwan, Kolkata.
2. Critchfield. H.J (1996) *General Climatology*. Prentice Hall of India, New Delhi.
3. Lawrence, G.R.P. (1979) *Cartographic Methods* (Second Edition). Methuen & Co., London.
4. Mather, J.R. (1974) *Climatology, Fundamentals and Applications.* MaGraw-Hill Publishing Co., New York
5. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration.* Methuen & Co. London.
6. Singh, R.L. and Singh, Rana P.B. (2005) *Elements of Practical Geography* (Revised Edition). Kalyani Publishers, New Delhi
7. Trewartha G.T. (1981) *An Introduction to Climate* (Fifth Edition). McGraw-Hill Publishing Co., New York.

ELECTIVE STREAM – 1
SOFT CORE (ELECTIVE) **24 hrs**
PRACTICALS IN POPULATION GEOGRAPHY **2 Credits**
PGGEO 538 **100 Marks**

Sl. No.	Topics
1	Rate of Population Change, Population Projection
2	Calculation of total fertility rate; Construction of life table; Singulate mean age at marriage
3	Collection of data on a given problem and report writing

References:

1. Agarwala, S.N. (1962) *Age at Marriage in India*. Kitab Mahal, Allahabad.
2. Barclay, G.W. (1958) *Techniques of Population Analysis*. John Wiley and Sons, New York.
3. Mandal, R.B., Uyanga, J. and Prasad, H. (2007) *Introductory Methods in Population Analysis*. Concept Publishing Company, New Delhi
4. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
5. Pathak, K.B. and Ram, F. (2013) *Techniques of Demographic Analysis*. Himalaya Publishing House, Mumbai.
6. Siegel, J.S and Swanson, D.A. (2004) *The Methods and Materials of Demography.* Academic Press, Boston.

ELECTIVE STREAM – 2
SOFT CORE (COMPULSORY)
INTERSHIP TRAINING REPORT AND VIVA VOCE **3 Credits**
PGGEO 541 **100 Marks**

During the course of M.Sc. Geography final year, Student will select any one organisation **(FISHERIES, VETINARY, PBMC, AGRICULTURE, INDIAN METROLOGICAL DEPARTMENT, DISASTER MANAGEMENT, FOREST, PUBLIC WORKS DEPARTMENT,** etc., for his /her on the internship training before completion of fourth semester examination.

Student will undergo internship with any one of the institutions specified for at least two weeks duration. After completion of their internship they will have to produce a **participation certificate** from the concern institution.

A **report** has to be submitted by the student mentioning the skills acquired during the period of internship. The students will also study the organisation **structure**, **information** system **profile** and **operational procedure** of the concerned institution.

It shall be evaluated by the examiners (Internal and external) for 100 Marks (50 Marks for report and 50 Marks Viva).

ELECTIVE STREAM – 2
SOFT CORE (COMPULSORY)

DISSERTATION	**3 Credits**
PGGEO 542	**100 Marks**

Format (Sub-headings) of the Dissertation

1	Introduction to the problem and study area, literature review
2	Methodology
3	Results
4	Conclusions
5	References

***70 Marks for dissertation & 30 marks for viva voce**

References:

1. Flowerdrew, R. and Martin, D (2005) *Methods in Human Geography: A Guide for Students Doing a Research Project*. Prentice Hall, New Jersey.
2. Gomez, B. and Jones, J.P. (eds) (2010) *Research Methods in Geography: A Critical Introduction*. Wiley – Blackwell, Chichester.
3. Hay, I. (2012) *Communication in Geography and the Environmental Sciences*. Oxford University Press, Oxford.
4. Kitchin, R. and Tate, N.J. (2000) *Conducting Research in Human Geography: Theory, Methodology and Practice*. Routledge, London.
5. Montello, D.R. and Sutton, P.C (2013) *An Introduction to Scientific Research Methods in Geography and Environmental Studies*. SAGE, London
6. Parsons, A.J. and Knight, P.G. (2005) *How to do Your Dissertation in Geography and Related Disciplines*. Routledge, Abingdon.

ELECTIVE STREAM – 2

SOFT CORE (ELECTIVE) 24 hrs

PRACTICAL IN GEOGRAPHY OF DEVELOPMENT 2 Credits

PGGEO 543 100 Marks

Sl. No.	Topic for Report Writing
1	Indices of human development
2	Indices of regional development
3	Collection of demographic and socio economic data at household level from primary and / or secondary sources and preparation of analytical survey report to assess the development of an area.

References:

1. Lawson, V.A. (2007) *Making Development Geography.* Hodder-Arnold, London.
2. Lindsay, Jim (1997) *Techniques in Human Geography*. Routledge, New York.

ELECTIVE STREAM – 2

SOFT CORE (ELECTIVE) **24 hrs**

PRACTICALS IN GEOGRAPHY OF POPULATION RESOURCE **2 Credits**

PGGEO 544 **100 Marks**

Sl. No.	Topics
1	Human development index
2	Poverty index
3	Gender related development index
4	Models for Population Resource Development
5	Collection of Data on a given problem and Report Writing

ELECTIVE STREAM – 2
SOFT CORE (ELECTIVE)
GEOGRAPHY FOR ALL **2 Credits**
PGGEO 545 **100 Marks**

Students shall adopt a village and conduct a survey for fifteen days (Highlighting the Socio-Economic Conditions, Problems and Suggestions for the development of the village in Andaman & Nicobar Islands).

*(50 Marks for Surveying and Report, 50 Marks for Viva).

ELECTIVE STREAM – 2

SOFT CORE (ELECTIVE) **24 hrs**

FUNDAMENTALS OF GIS **2 Credits**

PGGEO 546 **100 Marks**

Sl. No.	Topics
1	Database management System
2	RDBMS: Concepts and Components
3	Spatial data analysis: Vector Base and Raster Base
4	Recent trends and Applications of GIS

References:

1. Chang, K.T (2008) *Introduction to Geographic Information System: Avenue of the Americas*. McGraw-Hill, New York.
2. Burrough, P.A and Mc Donnell, R. A. (1998) *Principles of Geographic Information Systems.* Oxford University Press Inc., New York
3. Williams, J. (1995) *Geographical Information from Space: Processing and Applications of Geocoded Satellite Images*. John Wiley and Sons, New York.
4. Debarry, P.A. (1999) *GIS Modules and Distribution Models of the Watershed: A Report from ASCE Task Committee on GIS Modules and Distribution.* American Society of Civil Engineers, Reston, Virginia.
5. Environmental System Research Institute (1999) *Understanding GIS: The ARC/INFO Method*. ESRI Press, Redlands, California.

ELECTIVE STREAM – 2

SOFT CORE (ELECTIVE)	**24 hrs**
LAND MEASUREMENT AND DIVISION	**2 Credits**
PGGEO 547	**100 Marks**

Surveying: definition, types, Plane Table Survey: Radiation and Intersection method, Chain and tape survey, Field Book and Calculation of Area. Division of Land in 2, 3 or 5 parties.

References:

1. Dent, B. D., Torguson, J. S., and Holder, T. W. (2008) *Cartography: Thematic Map Design* (6th Edition). Mcgraw-Hill Higher Education.
2. Gupta, K. K. and Tyagi, V. C. (1992) *Working with Maps*. Survey of India, DST, New Delhi.
3. Kraak, Menno-Jan & Ormeling, Ferjan (2003) *Cartography: Visualization of Geospatial Data.* Prentice Hall, New Jersey.
4. Mishra, R. P. and Ramesh, A. (1989) *Fundamentals of Cartography*. Concept Publishing Company, New Delhi.
5. Sharma J. P. (2010) *Prayogic Bhugol*. Rastogi Publishers, Meerut.
6. Singh, R.L. and Singh, Rana P.B. (2005) *Elements of Practical Geography* (Revised Edition). Kalyani Publishers, New Delhi

ELECTIVE STREAM – 2

SOFT CORE (ELECTIVE) **24 hrs**

STUDY OF TOPO MAPS - (INDIAN ATLAS) **2 Credits**

PGGEO 548 **100 Marks**

Sl. No.	Topics
1	Indian Topomaps – SOI
2	Conventional Sign and Symbols; Marginal Information
3	Interpretation of SOI Topomaps: • *Physiography*-Contour, Bench Mark and Spot Height • *Water Bodies*-Natural and manmade Drainage • *Vegetation*- Natural and Human Induced Vegetation • *Cultural Features*- Transportation and settlements

References:

1. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography*. Macmillan, London.
2. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
3. Mishra, R.P. (1969) *Fundamentals of Cartography*. Prasaranga, University of Mysore.
4. Namowitz, S.N & Stone, Donald B. (1965) *Earth Science: The World We Live* (3rd Edition). Van Nostrand, Princeton
5. Sen, Ashis (1997) *Systematic Practical Geography*. Oriental Longman Ltd, Kolkata.
6. Singh, L.R. (2010) *Fundamentals of Practical Geography*. Sharada Pustak Bhavan, Allahabad.

ELECTIVE STREAM – 3 **3 Credits**
SOFT CORE (COMPULSORY) **100 Marks**
GEO SURVEYING-II
PGGEO 551

Sl. No.	Topics
1	Total Station –Surveying line and area patterns
2	GPS-Introduction, segments and Applications; Handling GPS Instrument
3	Extracting Point, Line and Polygon features
4	DGPS-Base Point Extraction; DGPS-High accuracy point extractions; Plotting GPS points into Graphs sheet

References:

1. Basak, N.N. (1994) *Surveying and Levelling*. Tata McGraw-Hill Publishing Company. New Delhi.
2. Davis, Peter (1974). *Science in Geography Data Description & Presentation* (Volume 3). Oxford University Press, Oxford.
3. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography*. Macmillan, London.
4. Mishra, R.P. (1969) *Fundamentals of Cartography*. Prasaranga, University of Mysore.
5. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co. London.
6. Robinson, A.H. et al (1985) *Elements of Cartography*. John Wiley and Sons, New York.
7. Singh, R.L. & Kanaujia, L.R.S. (1963) *Map Work & Practical Geography*. Central Book Depot. Allahabad.

ELECTIVE STREAM – 3
SOFT CORE (COMPULSORY)
SOCIO-ECONOMIC FIELD SURVEY **3 Credits**
PGGEO 552 **100 Marks**

A. Socio-Economic Field Survey & Viva
B. Making Questionnaire format
C. Conducting village and household survey and
D. Report writing of 1500 Words

(Report 50 Marks and Viva Voce 50 Marks)

ELECTIVE STREAM – 3

SOFT CORE (ELECTIVE) **24 hrs**

TECHNIQUES IN PHYSICAL GEOGRAPHY-II **2 Credits**

PGGEO 553 **100 Marks**

Sl. No.	Topics
1	Morphometric Analysis (Linear features)
2	Morphometric Stream Ordering
3	Bifurcation Ratio and Drainage Density
4	Slope Analysis: Meaning, Definition
5	Smith's Method
6	Wentworth's Method

References:

1. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
2. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography*. Macmillan, London.
3. Mishra, R.P. and Ramesh, A (1968) *Fundamentals of Cartography.* Prasaranga, Mysore.
4. Robinson, A.H. *et al* (1985) *Elements of Cartography*. John Wiley and Sons, New York.
5. Singh, L.R. (2010) *Fundamentals of Practical Geography*. Sharada Pustak Bhavan, Allahabad.

ELECTIVE STREAM – 3

SOFT CORE (ELECTIVE) **24 hrs**

STUDY OF TOPO MAPS-(INDIAN ATLAS) **2 Credits**

PGGEO 554 **100 Marks**

Sl. No.	Topics
1	Indian Topo-maps – Survey of India; Conventional Sign and Symbols
2	Interpretation of Survey of India Topo-maps; Marginal Information
3	Physiography – Contour, Bench Mark and Spot Height
4	Water Bodies – Natural and manmade Drainage
5	Vegetation – Natural and Human Induced Vegetation
6	Cultural Features – Transportation and settlements

References:

1. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography.* Macmillan, London.
2. Mishra, R.P. (1969) *Fundamentals of Cartography*. Prasaranga, University of Mysore.
3. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
4. Namowitz, S.N & Stone, Donald B. (1965) *Earth Science: The World We Live* (3rd Edition). Van Nostrand, Princeton
5. Sen, Ashis (1997) *Systematic Practical Geography.* Oriental Longman Ltd., Kolkata.
6. Singh, L.R. (2010) *Fundamentals of Practical Geography*. Sharada Pustak Bhavan, Allahabad.

ELECTIVE STREAM – 3

SOFT CORE (ELECTIVE) **24 hrs**
TECHNIQUES OF MAPPING AND ANALYSIS **2 Credits**
PGGEO 555 **100 Marks**

Sl. No.	Topics
1	Isopleth Method
2	Choro-Chromatic Method; Choro-Schematic Maps
3	Block Pile Diagrams
4	Pie Diagrams
5	Flow Diagrams
6	Method of Interpretation

***Two exercise for each**

References:

1. Hanwell, J. and Newson, M. (1973) *Techniques in Physical Geography*. Macmillan, London.
2. Kraak, Menno-Jan & Ormeling, Ferjan (2003) *Cartography: Visualization of Geospatial Data*. Prentice Hall, New Jersey
3. Mishra, R.P. and Ramesh, A (1968) *Fundamentals of Cartography.* Prasaranga, Mysore.
4. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
5. Nag, P (1992) *Thematic Cartography and Remote Sensing.* Concept Publishing Company, New Delhi.

ELECTIVE STREAM – 3

SOFT CORE (ELECTIVE) **24 hrs**

STATISTICAL METHODS IN GEOGRAPHY **2 Credits**

PGGEO 556 **100 Marks**

Sl. No.	Topics
1	Measurement of central tendency-meaning, Uses
2	Mean, median and Mode - Ungrouped and Grouped Data
3	Measures of dispersion: Mean Deviation – Ungrouped and Grouped
4	Standard Deviation (Ungrouped and Grouped); Quartile Deviation (Grouped and Ungrouped)
5	Measures of association: Correlation meaning and methods
6	Rank Order Correlation; Product movement Correlation

References:

1. Hammond, R. and McCullagh, Patrick S. (1974) *Quantitative Techniques in Geography: An Introduction*. Oxford University Press, Oxford.
2. Gupta, C.B. and Gupta, Vijay (2004) *An Introduction to Statistical Methods* (23rd Revised Edition). Vikas Publishing House, New Delhi.
3. Mahmood, Aslam (1998) *Statistical Methods in Geographical Studies*. Rajesh Publishers, New Delhi
4. Murray, R. Spiegel (1972) *Theory and Problems of Statistics (in SI units).* MaGraw-Hill Publishing Co., New York.
5. Singh, R.L. and Singh, Rana P.B. (2005) *Elements of Practical Geography* (Revised Edition). Kalyani Publishers, New Delhi

ELECTIVE STREAM – 3

SOFT CORE (ELECTIVE) **24 hrs**

PRACTICAL IN PHYSICAL GEOGRAPHY – II **2 Credits**

PGGEO 557 **100 Marks**

Sl. No.	Topics
1	Profile analysis: Serial, Superimposed, Projected Composite and Longitudinal, Intervisibility
2	Block Diagrams
3	Slope Analysis – Raiz Method and Wentworth Method
4	Hypsometric curve

***Two exercise each**

References:

1. King, C.A.M (1966) *Techniques in Geomorphology*. Edward Arnold Ltd, London.
2. Miller, A.A (1953) *The Skin of the Earth*. Methuen and Co. Ltd., London
3. Monkhouse. F.J and Wilkinson H.R (1971) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
4. Strahler A.N (1964) Quantitative Geomorphology of Drainage Basins and Channel Networks. In: Chow, V. (Ed) *Handbook of Applied Hydrology*. McGraw Hill, New York, 439 – 476.
5. Singh, Savindra. (1998) *Geomorphology.* Prayag Bhawan, Allahabad

ELECTIVE STREAM – 3

SOFT CORE (ELECTIVE) **24 hrs**

PRACTICALS IN GEOGRAPHY OF TOURISM **2 Credits**

PGGEO 558 **100 Marks**

Sl. No.	Topics
1	Sources of Data
2	Perception Studies
3	Tourism site Suitability/tourism development analysis
4	Analysis of Tourism Impact
5	Report Writing

References:

1. Kaul, R.K (1985) *Dynamics of Tourism and Recreation.* Inter India, New Delhi.
2. Pearce, D (1987) *Tourism Today: A Geographical Analysis*. Longman Scientific and Technical, New York.
3. Smith, L.J.S (2010) *Practical Tourism Research*. Centre for Agriculture and Bioscience International (CABI), Wallingford.
4. Smith, L.J.S. (2010) *Tourism Analysis: A Handbook.* Haistead Press, Sydney.

ELECTIVE STREAM – 4
SOFT CORE (COMPULSORY)
GEOGRAPHY FOR ALL **3 Credits**
PGGEO 561 **100 Marks**

Students shall adopt a village and conduct a survey for fifteen days (Highlighting the Socio-Economic Conditions, Problems and Suggestions for the development of the village in Andaman & Nicobar Islands).

***(50 Marks for Surveying and Report, 50 Marks for Viva)**

ELECTIVE STREAM – 4
SOFT CORE (COMPULSORY) **24 hrs**
PROJECT AND VIVA **3 Credits**
PGGEO 562 **100 Marks**

1. The students may select some of the following themes for their project.
   a. Land Evaluation
   b. Land-use/ Land cover Analysis
   c. Water Sources
   d. Slope Studies
   e. Climatic Change
   f. Settlement Studies
   g. Agricultural Studies
   h. Health Studies
   i. Infrastructure Studies
   j. Vegetation Studies
   k. Marine Resource
   l. Coastal Studies

2. The students should follow the research guidelines by reading Research Methodology before taking up the Project Work.

3. The Project should not cross 50 pages including photos, references and tables.

4. Project work must include quality maps, diagrams and flowcharts.

5. The project report should include following:
   a. Title of the project
   b. Introduction
   c. Review of literature
   d. Study Area
   e. Data Sources
   f. Main Objective
   g. Materials and Method
   h. Results & Discussion
   i. Conclusion
   j. Photos
   k. References

Above work has to be done with the consultation of the staff-in-charge. Viva-Voce would be conducted at the end.

References:

1. Archer, J.E. & Dalton, T.H. (1968) *The Field Work in Geography.* E.T. Bastaford Ltd., London.
2. Haring, Lloyd, Lounsbury, John F. and Frazier, John W. (1992) *Introduction to Scientific Geographical Research* (4th Revised Edition). Brown (William C.) Company USA.
3. Jones, P.A. (1968) *Field Work in Geography*. Longmans Green and Company, Harlow.
4. Kothari C.R. and Garg, Gaurav (2019) *Research Methodology: Methods and Techniques* (4th Edition). New Age International Publishers, New Delhi.
5. Mishra, R.P. (2016) *Research Methodology: A Handbook* (Revised and Enlarged). Concept Publishing Company, New Delhi.

ELECTIVE STREAM – 4

SOFT CORE (ELECTIVE) 24 hrs

PRACTICALS IN HUMAN GEOGRAPHY 2 Credits

PGGEO 563 100 Marks

Sl. No.	Topics
1.	Methods of representing and mapping of population data
2.	Methods of field study: preparation of questionnaire/ interview schedules
3.	Application of models using data
4.	Methods of representing and mapping of economic data

References:

1. Chorley, R.J. and Hagget, P. (Eds.) (2014) *Socio-economic Models in Geography* (Routledge Revivals). Routledge, London.
2. Lindsay, J.M. (1997) *Techniques in Human Geography.* Routledge, London.
3. Lloyd, P. and Dicken, B. (1972*) Location in Space: A Theoretical Approach to Economic Geography*. Harper and Row, New York.
4. Monkhouse. F.J and Wilkinson H.R (1971) *Maps and Diagrams: Their Compilations and Concentration.* Methuen & Co., London.
5. Wood, Andrew. and Roberts, Susan. (2011) *Economic Geography: Places, Network and Flows*. Routledge, London.

ELECTIVE STREAM – 4

SOFT CORE (ELECTIVE) **24 hrs**

PRACTICALS IN RURAL SETTLEMENTS **2 Credits**

PGGEO 564 **100 Marks**

Sl. No.	Topics
1	Methods of concentration of rural settlements
2	Chi-square test for environmental factors responsible for pattern variation of settlements
3	Measurement of shape (pattern) of rural settlements
4	Methods for measuring spacing of settlements
5	Collection of data on given problem and report writing

References:

1. Haggett, Peter. (1965) *Locational Analysis in Human Geography*. Edward Arnold, London.
2. Mandal, R.B. (2001) *Introduction to Rural Settlement*. Concept Publishing Company, New Delhi.
3. Monkhouse. F.J and Wilkinson H.R (1966) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.

ELECTIVE STREAM – 4

SOFT CORE (ELECTIVE)	**24 hrs**
FUNDAMENTALS OF GIS	**2 Credits**
PGGEO 565	**100 Marks**

Sl. No.	Topics
1	Map elements: scale, projection, coordinate systems
2	Introduction to GIS Software (open source)
3	Data inputs scanning/acquiring data
4	Georeferencing of maps
5	Digitization and attribution
6	Topology: error detection and correction
7	Data visualization, map layout design and symbology

References:

1. Burrogh, P.A. and McDonnell, R.A. (1998) *Principles of Geographical Information System.* Oxford University Press Inc, New York.
2. Chang, K.T. (2008) *Introduction to Geographic Information System: Avenue of Americas*. McGraw-Hill, New York.
3. Environmental System Research Institute (1999) *Understanding GIS: The ARC/INFO Method*. ESRI Press, Redlands, California.
4. Quantum GIS User Guide, http://docs.qgis.org/1.8/pdf/QGIS-1.8-UserGuide-en.pdf
5. Thiede, R., Sutton, T., Duster, H. and Sutton, M. (2013) *The Quantum GIS Training Manual*. Locate Press LLC, USA.

ELECTIVE STREAM – 4

SOFT CORE (ELECTIVE) **24 hrs**

ANALYSIS OF SOCIO ECONOMIC DATA **2 Credits**

PGGEO 566 **100 Marks**

Sl. No.	Topics
1	Graphs and Diagram of Socio-Economic data
2	Types of Graphs and its importance
3	Simple line Graph; Bar Graphs; Compound Bar Graph
4	Rank Size Rule
5	Deviational Graph

References:

1. Lawrence, G.R.P. (1979) *Cartographic Methods* (2nd Edition). Methuen & Co., London.
2. Mishra, R.P. (1969) *Fundamentals of Cartography*. Prasaranga, University of Mysore.
3. Monkhouse. F.J and Wilkinson H.R (1952) *Maps and Diagrams: Their Compilations and Concentration*. Methuen & Co., London.
4. Raisz, E (1962) *Principles of Cartography*. Mc Graw Hill Inc., New York.
5. Robinson, A.H., Morrison, J.L., Muehrcke, P.C., Kimerling, A.J., and Guptill, S.C. (1995), *Elements of Cartography*. John Wiley, New Jersey.
6. Singh, R.L. and Singh, Rana P.B. (2005) *Elements of Practical Geography* (Revised Edition). Kalyani Publishers, New Delhi.

ELECTIVE STREAM – 4

SOFT CORE (ELECTIVE) **24 hrs**

INTERPRETATION OF AERIAL PHOTOGRAPHY AND SATELLITE IMAGES **2 Credits**

PGGEO 567 **100 Marks**

Sl. No.	Topics
1	Determination of Aerial Photo Scale
2	Procedure of acquiring Aerial Photographs
3	Types of Aerial Photographs
4	Elements of Aerial Photographs
5	Stereographic Interpretation of Aerial Photographs
6	Interpretation of Satellite Imagery – Identification of features through signatures, colour identifications

References:

1. Wolf, Paul R., DeWitt, Bon and Wilkinson, Benjamin (2014) *Elements of Photogrammetry with Applications in GIS* (Fourth Edition). McGraw-Hill Education, New York.
2. Graydon, L. Berlin (2001) *Fundamentals of Remote Sensing and Air Photo Interpretation* (Sixth Edition). Prentice Hall, New York.
3. Campbell, James B. (1996) *Introduction to Remote Sensing*. Routledge, London.
4. Joseph, George (2018) *Fundamentals of Remote Sensing* (Third Edition). University Press (India) Pvt. Limited, Hyderabad.

ELECTIVE STREAM – 4
SOFT CORE (ELECTIVE)
ASSIGNMENT BASED SEMINAR **2 Credits**
PGGEO 568 **100 Marks**

*50 Marks for a assignment and 50 marks for interactive session