University of Pune

Two Year M A. / M.Sc. Post Graduate Course in Geography

(Credit and Semester based Syllabus to be implemented from Academic Year 2013-14)

1) Title of the Course:

M. A. / M.Sc. Geography

2) Preamble of the Syllabus:

Master of Arts (M. A.) / Master of Science (M.Sc.) in Geography is a post graduation course of University of Pune. The credit system to be implemented through this curriculum, would allow students to develop a strong footing in the fundamentals and specialize in the disciplines of his/her liking and abilities.

The students pursuing this course would have to develop in depth understanding of various aspects of the subject. The working principles, design guidelines and experimental skills associated with different fields of Geography such as Geomorphology, Climatology, Economic Geography, Population Geography, Settlement Geography, Remote Sensing and GIS (Geoinformatics), etc.

3) Introduction:

Salient Features of the Credit System:

1. Master's degree course in Geography would be of 100 credits, where one credit course of theory will be of one clock hour per week running for 15 weeks and one credit for practical course will consist of 15 hrs of laboratory. Thus, each credit will be equivalent to 15 hours.
2. Student will have to take admission in Geography and complete at least 75 credits incorporated in the syllabus structure of Geography. The remaining 25 credits shall be chosen from the courses offered by the department or other Departments of the University/College with credit system structure.
3. Besides Credits related to practical Courses, students may be allowed to take courses with less weightage per semester on the condition they complete the degree in maximum of four years. This provision can be availed which is subject to the availability of concerned courses in a given semester and with a maximum variation of 25 credits (in case of fresh credits) per semester in the concerned department/college.
4. Every student shall complete 100 credits in a minimum of four semesters. Semesters I & II will have 50 credits and Semesters III & IV will have 50 credits.
5. The student will be declared as failed if he/she does not pass in all credits within a total period of four years. After that such students will have to seek fresh admission as per admission rules prevailing at that time.
6. Academic calendar showing dates of commencement and end of teaching, internal assessment tests and term end examination will be prepared and duly notified before commencement of each semester every year.

Instructions for the Students:

The students seeking admission to M.A./M.Sc. Geography course is hereby informed that they are supposed to adhere to the following rules:

1. A minimum of 75 % attendance for lectures / practical is the pre-requisite for grant of term.
2. There shall be tutorial / practical / surprise test / home assignment / referencing of research papers / seminar / industrial visits/Field Visit / training course/viva-voce as a part of internal assessment in each semester. The students are supposed to attend all the tests. The students should note that re-test will not be permitted to the student absent for the test/s unless the case is considered by competent authority.
3. The students opting for dissertation course shall follow the rules framed for the same.
4. The students are supposed to attend all the Industrial Workshops / Laboratory Workshops / Training Programme/ symposia/ seminar/ field visit / study tour organized by the Department/college.

4) Eligibility:

The candidate should have B.A. with Geography special or B.Sc. with Geography as a special subject or Any B.Sc. with Geography at second year level.

Admission: Admissions will be given as per the selection procedure / policies adopted by the respective college, in accordance with conditions laid down by the University of Pune.
Reservation and relaxation will be as per the university/government rules.

5) Examination

[A] Pattern of Examination

Evaluation of Students:

1) The In-semester and End-Semester examinations will have equal weightage of 50% each.
2) Student has to obtain 40% marks in the combined examination of In-Semester and End-Semester assessment with minimum passing of 30% marks in both assessments separately.
3) A student cannot register for third semester if he/she fails to complete the 50% credits of the total expected in first two semesters.
4) Internal marks remain unchanged and internal assessment cannot be repeated. If student remain absent during internal assessment examination, he/she will have second chance with the permission of the competent authority. It will be under the discretion of the competent authority and internal departmental assessment committee. In case he/she wants to repeat Internal, he/she can do so only by registering for the said courses.
5) There shall be revaluation of answer books of theory courses only of semester-end examination, but not of internal assessment papers.

i. In-semester Examination: Internal assessment for each course would be continuous and dates for each tutorials/practical tests etc. will be pre-notified in the time table for teaching or placed separately as a part of time table. Department / College Internal Assessment Committee will coordinate this activity.

a) Theory Courses: Students should be encouraged to participate in various academic activities. A teacher must select a variety of the procedures for conducting internal assessment suggested as follows.

a) Multiple choice questions
b) Combination of objective and subjective questions.
c) Open book test (concerned teacher will decide what books are to be allowed for this purpose)
d) Tutorial
e) Surprise test on specified topics in a given notified period
f) Oral
g) Assignments
h) Review of research paper
i) Seminar presentation
j) Journal/Lecture/Library notes

b) Practical Courses: It is a continuous evaluation process. Practical courses will be evaluated on the basis of the following:

1. Performance assessment of each practical on the basis of attendance, punctuality, journal completion, practical skills, results, analysis and oral.
2. Assessment of practical course be conducted before the semester-end examination.
3. Assessment of each practical shall be done for each practical, weekly.
4. Assessment of the activity will be based on any one of the following (per practical course).
   i. Field visit report/ study tour report

- **<u>The student strength of practical batch shall be 12 (twelve).</u>**

Project Course: Project will be evaluated by the examiner/s in consent with the project guide if required.

ii. End-Semester Examination: The End-semester examination programme will be scheduled as per the notifications and guidelines issued by the Examination section of University of Pune.

[B] Standard of Passing

Student has to obtain 40% marks in the combined examination of In-Semester and End-Semester assessment with minimum passing of 30% passing in both assessments separately.

[C] ATKT Rules

A student cannot register for third semester if he/she fails to complete the 50% credits of the total credits expected to be ordinarily completed within first two semesters.

[D] Award of Class

Grades will be awarded from grade point average (GPA) of the credits.

GPA Rules:

1. The formula for GPA will be based on Weighted Average. The final GPA will not be printed unless a student passes courses equivalent to minimum 100 credit hours (Science). Total credit hours indicate the sum of credit hours of the courses which a student has passed.
2. A seven point grade system [guided by the Government of Maharashtra Resolution No. NGO – 1298 / [4619] / UNI 4 dt. December 11, 1999 and University regulations] will be followed. The corresponding grade table is attached herewith.
3. If the GPA is higher than the indicated upper limit in the third decimal digit then the student be awarded higher final grade (e.g. a student getting GPA of 4.492 may be awarded ‘A’)
4. For Semester I, II, III examinations, only the grade points will be awarded for each subject. Final GPA along with final grade will be awarded only at the end of IV semester. There is also a provision for verification and revaluation. In case of verification, the existing rules will be applicable. The revaluation result will be adopted if there is a change of at least 10% marks and in the grade of the course.
5. After the declaration of result, for the improvement of Grade, the student can reappear for the examination of 30 credits worth theory courses.
6. Grade improvement programme will be implemented at the end of the academic year. A student can opt for grade improvement programme only after the declaration of final semester examination i.e. at the end of next academic year after passing M.A./M.Sc. (Geography) examination and within two years of completion of M.A./M.Sc. (Geography). A student can appear for grade improvement programme only once.

Grade and Grade Point Average		
Marks	**Obtained Grade**	**Grade Points**
100 – 75	**'O'** Outstanding	06
74 – 65	**'A'** Very Good	05
64 – 55	**'B'** Good	04
54 – 50	**'C'** Average	03
49 – 45	**'D'** Satisfactory	02
44 – 40	**'E'** Pass	01
39 and less	**'F'** Fail	00

Final Grade Points	
Grade Points	**Final Grade**
5.00 – 6.00	**O**
4.50 – 4.99	**A**
3.50 – 4.49	**B**
2.50 – 3.49	**C**
1.50 – 2.49	**D**
0.50 – 1.49	**E**
0.00 – 0.49	**F**

Common Formula for Grade Point Average (GPA):

$$GPA = \frac{\text{Total of Grade Points earned} \times \text{Credit hours for each course}}{\text{Total Credit hours}}$$

B Grade is equivalent to at least 55% of the marks

[E]External Students: There shall be no external students.

[F]Setting of Question Paper / Pattern of Question Paper

For core (compulsory) theory courses end-semester question papers will be set by the University of Pune and centralized assessment for theory papers will be done as per the University instructions. Questions should be designed to test the conceptual knowledge and understanding of the basic concepts of the subject.
The pattern of question papers shall be as follows:

Number of credits	Internal Marks (50%)	External Marks (50%)	Total Marks	Duration	Total Number of Questions	Question to be **attempted**
2	25	25	50	1 ½ hrs	3	2
3	37	38	75	2 hrs	5	3
4	50	50	100	2 ½ hrs	6	4

All questions will have equal weightage

[G]Verification / Revaluation

There is also a provision for verification and revaluation. In case of verification, the existing rules will be applicable. The revaluation result will be adopted if there is a change of at least 10% marks and in the grade of the course. There shall be revaluation of answer script of end semester examination, but not of internal assessment papers & practical courses.

6) Structure of Course

Basic structure/pattern (Framework) of the postgraduate syllabus for the two year integrated course leading to M.A. / M.Sc. (Geography) in the colleges affiliated to Pune University.

M. A./M.Sc. Geography - Course structure & Credits Distribution

M.A./M.Sc. Geography

Theory
- In-Semester Examination : 50%
- End-Semester Examination : 50%

Practical
- In-Semester Examination : 50%
- End-Semester Examination : 50%

a) Medium of Instructions: English.

7) University Terms:

Dates for commencement and conclusion for the first and second terms will be declared by the University authorities. Terms can be kept by only for duly admitted students. The term shall be granted only on minimum 75 percent attendance at theory and practical course and satisfactory performance during the term.

9) Qualification of Teacher:

i. M.A./M.Sc. (Geography) degree with NET/SET/ Ph.D qualification.
ii. Recognition of Pune University as a post-graduate teacher, by papers.
iii. Other criteria as per the guidelines of UGC/government/ University of Pune.

10) Detail Syllabus with Recommended Books: Attached with this document

Note- Pl. refer circular no. pu/muum /111 dated -08/04/2013 for clarifications

(Rules and Regulation for the Credit and Semester System in Post Graduate Centres of the affiliated colleges of the University of Pune)

Equivalence of Syllabus in Geography (M.A. / M.Sc.) effective from June 2013

Old Syllabus – Semester I (June 2009)		**New Syllabus – Semester I (June 2013)**	
Gg.-101	Principles of Geomorphology	Gg.-101	Principles of Geomorphology
Gg.-102	Principles of Climatology	Gg.-102	Principles of Climatology
Gg.-103	Principles of Economic Geography	Gg.-103	Principles of Economic Geography
Gg.-104	Principles of Population and Settlement Geography	Gg.-104	Principles of Population and Settlement Geography
Gg.-105	Practical in Physical Geography (a) Geomorphology (b) Climatology (a) Field Visit up to seven days	Gg.-105	Practicals in Physical Geography
Old Syllabus – Semester II		**New Syllabus – Semester II**	
Gg.-201	Quantitative Techniques in Geography	Gg.-201	Quantitative Techniques in Geography
One of the following according to specialization		**One of the following according to specialization**	
Gg.-210	Tropical Geomorphology	Gg.-310	Tropical Geomorphology
Gg.-211	Synoptic Climatology	Gg.-211	Synoptic Climatology
Gg.-212	Agricultural Geography	Gg.-212	Agricultural Geography
Gg.-213	Population Geography	Gg.-213	Population Geography
Gg.-214	Geoinformatics- Paper I	Gg.-208	Geoinformatics- Paper I
One of the following according to specialization		**One of the following according to specialization**	
Gg.-220	Fluvial Geomorphology	Gg.-220	Fluvial Geomorphology
Gg.-221	Monsoon Climatology	Gg.-221	Monsoon Climatology
Gg.-222	Industrial Geography	Gg.-222	Industrial Geography
Gg.-223	Geography of Rural Settlements	Gg.-223	Geography of Rural Settlements
Gg.-224	Geoinformatics- Paper II	Gg.-209	Geoinformatics- Paper II
Gg.-202	Practical in Human Geography (a) Economic Geography (b) Population and Settlement Geography	Gg.-106	Practicals in Human Geography
Gg.-203	Practical in Surveying and Map Projection.	Gg.-203	Practical in Surveying and Map Projection.

UNIVERSITY OF PUNE				
M.A. / M. Sc Syllabus in Geography (Credit System)				
From- June, 2013				
SEMISTER - I				
COURSE CODE	**COURSE TITLE**	**CREDITS PER COURSE**	**CREDITS TO BE COMPLITED**	
	CORE COURSES (ALL COURSES ARE COMPULSORY)		**COURSE WISE**	**SEMESTER WISE**
Gg-101	Principles of Geomorphology	4	4	
Gg-102	Principles of Climatology	4	4	
Gg-103	Principles of Economic Geography	4	4	
Gg-104	Principles of Population and Settlement Geography	4	4	
Gg-105	Practical in Physical Geography	4	4	
Gg-106	Practical in Human Geography	4	4	
	Total courses in the semester	**6**	**24**	**24**

SEMISTER - II				
COURSE CODE	**COURSE TITLE**	**CREDITS PER COURSE**	**CREDITS TO BE COMPLITED**	
	CORE COURSES		**COURSE WISE**	**SEMESTER WISE**
Gg-201	Quantitative Techniques in Geography	3	3	
One of the following according to specialization				
Gg-210	Coastal Geomorphology	3	3	
Gg-211	Synoptic Climatology	3		
Gg-212	Agricultural Geography	3		
Gg-213	Population Geography	3		
One of the following according to specialization				
Gg-220	Fluvial Geomorphology	3	3	
Gg-221	Monsoon Climatology	3		
Gg-222	Industrial Geography	3		
Gg-223	Geography of Rural Settlement	3		
CORE COURSES (ALL COURSES ARE COMPULSORY)				
Gg-202	Practical in Cartography	2	2	
Gg-203	Practical in Surveying and Field visit	3	3	
ELECTIVE COURSES (Any Four From the Following; but Gg-208 & Gg209 together)				
Gg-204	Geography of Tourism	3	12	
Gg-205	Geography of Disaster Management	3		
Gg-206	Geography of Energy Resources	3		
Gg-207	Practical in Terrain Analysis	3		
Gg-208	Geoinformatics-I	3		
Gg-209	Geoinformatics-II	3		
	Total courses in the semester	**9**	**26**	**26**

UNIVERSITY OF PUNE				
M.A. / M. Sc Syllabus in Geography (Credit System) From- June, 2014				
SEMISTER - III				
COURSE CODE	**COURSE TITLE**	**CREDITS PER COURSE**	**CREDITS TO BE COMPLITED**	
	CORE COURSES		**COURSE WISE**	**SEMESTER WISE**
Gg-301	Geography of India with special Reference to Maharashtra	3	3	
	One of the following according to specialization			
Gg-310	Tropical Geomorphology	3	3	
Gg-311	Applied climatology	3		
Gg-312	Trade and Transport Geography	3		
Gg-313	Urban Geography	3		
	One of the following			
Gg-320	Multivariate Statistics	3	3	
Gg-321	Political Geography	3		
Gg-322	Geography of Soils	3		
	One of the following according to specialization			
Gg-330	Practical in Geomorphology	3	3	
Gg-331	Practical in Climatology	3		
Gg-332	Practical in Economic Geography	3		
Gg-333	Practical in Population and Settlement Geography	3		
	(Note : Field work / visit for duration should not be less than 2 days to be undertaken)			

Gg-302	Interpretation of Topographical Maps & Village Survey / Project work	4	4	
	ELECTIVE COURSES (Any three From the Following; but Gg-306 & Gg307 together)			
Gg-303	Research Method in Geography	3	9	
Gg-304	Social &Cultural Geography	3		
Gg-305	Practical in Watershed analysis	3		
Gg-306	Geoinformatics-III	3		
Gg-307	Practical in Geoinformatics	3		
	Total courses in the semester	**8**	**25**	**25**

SEMISTER - IV				
COURSE CODE	**COURSE TITLE**	**CREDITS PER COURSE**	**CREDITS TO BE COMPLITED**	
	CORE COURSES		**COURSE WISE**	**SEMESTER WISE**
Gg-401	Theoretical and Applied Geography	3	3	
Gg-402	Principles of Remote Sensing and GIS	3	3	
Gg-403	Practical in Remote Sensing and GIS	3	3	
	One of the following			
Gg-420	Regional Planning and Development	3	3	
Gg-421	Geography of Water Resources	3		
Gg-422	Biogeography	3		
Gg-423	Oceanography	3		
Gg-424	Natural and Manmade Hazards	3		
	One of the following			
Gg-440	Dissertation	4	4	
Gg-441	Principles of Regional Geography & Project Work	4		
ELECTIVE COURSES (ALL COURSES ARE COMPULSORY)				
Gg-404	Geography of Food Security of India	3	3	
Gg-405	Geography of Health	3	3	
Gg-406	Practical in Global positioning	3	3	
	Total courses in the semester	**8**	**25**	**25**
			Total Credit	**100**

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg:101 **Title: Principles of Geomorphology**

No. of Credits: 04 **No. of Periods: 60**

No. of Credits:	Topic	Sub Unit	Learning points	No of Periods
1.	Fundamentals of Geomorphology	1. Nature and scope 2. Concepts	1. Definition and history of Geomorphology 1. Uniformaterianism and Catastrophism 2. Geomorphic (Cyclic, Graded and Steady) and Spatial Scale 3. Geological time scale 4. Process Geomorphology	6

2.	Tectonism and Geomorphology	1.Interior of the Earth. Sources of Knowledge	1. Inferred Knowledge (Density, Temperature, Pressure) 2. Surface Expressions (Seismic Wave Evidences) Holmes Convection Current Theory	
		2. Endogenic Forces	1. Epiorogenic and Orogenic Movements 2. Compression, Tension 3. Folds, Types and Landforms 4. Faults, Types and Landforms	04 02
		3. Isostasy	1. Views of Airy and Pratt 2. Gravity Anomalies 3. Global Isostatic adjustments	02
		4.Wegener's Continental Drift Theory	1. Theory, Supporting Evidences and Validity	04
		5. Sea Floor Spreading 6. Plate Tectonics	1. Palaeomagnetism 2. Oceanic Relief 3. Sea Floor Spreading 4. Plate Boundaries, 5. Mechanics and Movements of Plates 6. Zone of Collision and Associated Landforms	04

3.	Climatic Geomorphology	1.Denudational Processes 2.Weathering and Mass movement	1. Weathering 2. Mass Movement 3. Erosion 4. Definitions and Comparison of these processes 1. Types of Weathering- Physical, Chemical, Biotic 2. Types of Mass Movement – Slides, falls, flows and creep	06
4.	Fluvial Processes	Work of River	1. Drainage Basin and Drainage Patterns 2. Davisian Cycle of river erosion and Concept of Peneplanation	
			3. Mechanics of Erosion , Transportation and Deposition 4. Erosional Landforms	08
5.	Glacial Processes	Work of Glacier	1. Types of Glaciers 2. Mechanics of Erosion, Transportation and Deposition 3. Erosional Landforms 4. Depositional Landforms	06
6.	Arid and Semi Arid Processes	1. Work of Water in Desert 2. Work of Wind in Desert	1. Landforms produced by Water in the Desert 2. Concept of Pediplanation 3. Mechanics of Erosion , Transportation and Deposition	06

7.	Coastal Processes	Work of Waves and Tides	1. Mechanics of Erosion , Transportation and Deposition 2. Erosional Landforms 3. Depositional Landforms	06
8.	Hill slopes	Slope Profiles: Elements Facets and Segments	Models of Slope development 1.Evolution: Slope decline 2.Slope Replacement 3.Parallel Retreat	06

Reference Books:

1. Thornbury, W. D. (Rep.2011): Principles of Geomorphology, John Wiley and Sons, New York.
2. Chorley, R. J., Schumm, S. A. and Sugden, D. E. (1984): Geomorphology, Methuen, London.
3. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
4. Savindra Singh (Rep. 2011): Geomorphology, Prayag Pustak Bhawan, Allahabad
5. Spark B. W. (1972): Geomorphology, Longman, New York
6. Steers, A. (1958). The Unstable Earth, Methuen, London
7. Ollier, C. D. (1981) Tectonics and Landforms, Longman , London
8. Strahler A. H and Strahler, A. N. (1992) : Modern Physical Geography, John Wiley, New York
9. Wooldridge and Morgan: Geomorphology
10. Holmes: Physical Geology
11. Fairbridge, R. W. (1968): Encyclopedia of Geomorphology, Reinholdts, New York.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 102 **Title: Principles of Climatology**

No. of Credits: 04 **No. of Periods: 60**

Unit. No	Unit	Sub unit	Learning Points	No of periods
1.	Introduction	Nature and Scope	Weather, Climate, Subdivisions of Climatology. Development of Modern Climatology. Tropical Climatology	04
2.	Earth`s atmosphere	1.Composition 2. Vertical structure	Physical properties, Chemical composition Temperature changes, Vertical variations in the composition, Ionosphere and aurora	06
3.	Insolation and Heat Balance	1. Solar radiation 2. Distribution 3. Effect of Atmosphere 4.Terrestrial Radiation	Electromagnetic spectrum, Factors affecting insolation. Latitudinal and Seasonal, variation of insolation Scattering, Diffusion Absorption Reflection, Albedo Green House Effect. Heat Budget Latitudinal Heat Balance Atmospheric window.	07

4.	Temperature	Basic concepts	Difference between Heat and Temperature Controls of temperature Horizontal and Vertical distributions, Inversion of temperature	06
5.	Air pressure and wind	Basic concepts	Pressure measurement and Units, Factors affecting air pressure, Pressure changes with altitude, Observed distribution of surface pressure. Wind observation and measurement, Factors affecting wind. Geostrophic wind, Gradient wind	09
6.	Circulation of the Atmosphere	1.Scales of Atmospheric Motion 2. Models of general circulation	Primary, Secondary, Tertiary. Local winds, Idealized circulation, Observed global circulation. Tri-cellular theory, Eddy theory Jet stream and it's effect on the surface weather conditions.	08
7.	Humidity	1. Basic Concepts 2. Hydrological Cycle 3. Condensation 4. Evaporation	Humidity measurement Changes of state of water Factors affecting Condensation Factors affecting Evaporation	06
8.	Stable and unstable Atmosphere	1. Lapse rate 2. Stability	Normal, environmental, dry and wet adiabatic Absolute stability, Absolute instability, Conditional instability.	06

9.	Air masses and Fronts	Basic Concept	Source region ; classification of air masses Modifications: (a) Mechanical (b) Thermodynamic. Characteristics and Types of Fronts	06
10.	Weather Forecasting	Methods of Forecasting	Any Two Methods	04

Reference Books:

1. Frederick K. Lutgen, Edward Tar buck: “The Atmosphere An Introduction to Meteorology” Prentice Hall, Englewood Cliffs ,New Jersey 0762 ,1998
2. D. S. Lal: Climatology. Sharda Pustak Bhawan ,11 , University road Allahabad- 211002 Edition 2003
3. Trewartha : Introduction to Weather and Climate.
4. H.J. Critchfield (Rep.2010): General Climatology. Prentice Hall, New Delhi
5. SINGH (SAVINDRA) (Rep.2011)Climatology
6. ROB VAN DEN BERG (2009) Evaluating Climate Change and Development

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 103 **Title: Principles of Economic Geography**

No. of Credits: 04 **No. of Periods: 60**

Unit No	Unit	Sub unit	Learning points	No. of Periods
1.	Introduction	Nature and Scope	Definition, nature and scope, Recent trends in Economic Geography	06
2.	Hypotheses in Economic Geography	Types of Hypotheses	Formation and Testing of hypotheses	06
3.	Economic Landscape	1.Historical Evolution 2. Location of economic activity	Homestead, Tribal and Village economy, Modern economic landscape. Von Thunen and Weber's models.	10
4.	Resources	Natural and Human Resources	Significance of Natural and Human resources in Economic Development.	04
5.	Factors of Production and related aspects.	1.Land, Labor and Capital 2. Transportation Demand Economies of scale.	Significance of land, labor and capital in different economic activities, Spatial variation in the factor cost, Variation in cost of transportation, spatial variation in demand, Internal and external economies of scale.	10

6.	Economic Development	Spatial and Temporal aspects	Measures of economic development classification of countries. Rostow's and Myrdal's models	10
7.	International Trade	Spatial and Temporal aspects	Factors influencing the International trade, structure, problems and prospects. Ricardo's classical theory.	08
8.	Economic Development in India	1. Regional disparity 2. History of development	Natural and Cultural factors Pre and Post-independence. Impact of Green Revolution, Privatization, Globalization.	06

Reference Books:

1. Hartshorne, T.A. and J.W. Alexander (1988) –Economic Geography, Prentice Hall.
2. Janaki. V.A. (1985) –Economic Geography, Concept Publishing Co.
3. Lloyd, P.and P. Dicken (1972) –Location in space : A theoretical approach to Economic Geography, Harper and Row, New York.
4. McCarty, H.H. and J.B. Lindberg (1966) – A Preface to Economic Geography, Englewood Cliffs, N.J.Prentice.
5. Thomas, Conkling and Yeates (1974) – Geography of Economic Activity, Mc Graw Hill, New York..
6. Knox, P. and J. Agnew (1998) – The Geography of the World Economy. Arnold, London
7. Hanink, D. M. (1997). Principles and Applications of Economic Geography, Economy, Policy, Environment, John Wiley and Sons,New York.
8. Dreze, J. and Sen, A. (1996) – Economic Development and Social Opportunity. Oxford University Press, New Delhi.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 104 **Title: Principles of Population and Settlement Geography**

No. of Credits: 04 **No. of Periods: 60**

Unit No.	Unit	Sub Unit	Learning Points	No.of periods
1	Introduction	Evaluation of Settlement & Population Geography	1. Evaluation of Settlement Geography 2. Evaluation of Population Geography 3. Changes in the approaches to the study of Population and Settlement	04
2.	Man-environment Relationship	Factors influencing the growth and distribution of Settlements.	1. Physical 2. Economic 3. Societal	04
3.	Settlement Patterns	Changes in the Shelter and Patterns of Settlement.	1.Various patters of Settlement. 2. Effects of technology on shelter and pattern from Neolithic to Modern period.	06
4.	Dispersion and Nucleation	Factors influencing the dispersion and nucleation	1. Physical 2. Social 3. Economic 4. Method of Measuring degree of dispersion, Nearest Neighbors Method.	08

5.	Concepts related to Settlement	1. Various Concepts 2. Settlement Theory	1. Nodality 2. Centrality 3. Range 4. Threshold & Hierarchy 5. Rank-size distribution 1. Christaller and Losch's Model	08
6.	Concentration of Population and Levels of Urbanization	1. Urbanization 2. Factors of Urban Growth	Concept of Urbanization 1.Improvement in transportation & Communication. 2.Changes in Industrial Production. 3.Industrialization 4.Food supply and Public hygiene	08
7.	Population Distribution	Factors influencing the Distribution of Population	1. Physical 2. Economic 3. Social 4. Political	08
8.	Theories of Population Growth	1. Thomas Malthus 2. Ricardo 3. Demographic Transition Model	1. Concept 2. Scope 3. Applications 4. Relevance	08
9.	Population as a resource	Various aspects of population	1. Size 2. Growth 3. Age 4. Education	06

Reference Books:

1. Beaujeu Garnier J. – Geography of Poluation, Longman Group Ltd.
2. Chandna R. C. (Rep.2010) – A Geography of Population, Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi
3. Clark J. I. (1973) – Population Geography, Pergamon Press Ltd., Oxford
4. Clark J. I. Geography of Population Approaches and Applications, Pergamon Press Ltd., Oxford
5. Michel Chisholm – Studies in Human Geography.
6. Hudson, Settlement Geography.
7. Mishra, R.S. : Economics of Growth and Development , Somaiya Publication Pvt. Ltd.
8. Bhende Asha and Kanitkar T. – Principles of Population Studies, Himalaya Publishing House, Bombay.993
9. Singh R. L. – Readings in Settlement Geography. The National Geographical Society of India.
10. Graham,(2005) Population Geography
11. Singh R.Y. (Rep. 2010)Geography of Settlements

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 105 **Title: Practicals in Physical Geography**

No. of Credits: 04 **No. of Practicals: 20**

unit No.	Unit	Subunit	Learning points	Practicals (3 hours duration)
a. Geomorphology				
1	Drainage Network	1. Stream Ordering	1. Horton and Strahler methods of stream ordering (for a 3 to 5 order drainage basin) 2. Relationship between stream order and number; Bifurcation ratio	03
2	Drainage basin	2. Basin relief analysis	Relief analysis (for a 3 to 5 order drainage basin; based on grid method) 1. Absolute relief map 2. Relative relief map 3. Slope, Aspect map (degrees) 4. Dissection index map 5. Hypsometric integral 6. Basin cross profiles 7. Block Diagram (multiple section)	09

b. Climatology				
3.	Climatic elements	Preparation of climatic diagrams	1.Climatograph 2. Climograph 3. Simple wind rose 4. Hythergraph	04
4.	Classification of Climate	1.Climatic classification of Koppen and Thornthwaite 2. Water budget	1.Determination of climatic type by using Koppen's and Thornthwaite's scheme of classification. Construction of water budget diagram using Precipitation & potential evapo-transpiration data	04

Reference Books:

1. King, C. A.M (1966): Techniques in Geomorphology, Edward Arnold, London
2. Monkhouse, F. J. and Wilkinson, H. R., (1976). Maps and Diagrams, Methuen & Co.
3. Savindra Singh (2002): Geomorphology, Prayag Pustak Bhawan, Allahabad
4. Miller, Austin (1953): The skin of the Earth, Methuen & Co. Ltd. London
5. Strahler: Physical Geography
6. ROBINSON Elements of Cartography 6/e Rep. (2010)

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syallbus (from June,2013)

Code No. Gg: 106 **Title: Practicals in Human Geography**

No. of Credits: 04 **No. of Practicals: 20**

Unit.No	Unit	Subunit	Learning Points	Practicals (3 hours duration)
a. Economic Geography				
1.	Crop Combination	Methods	1. Weaver's method 2. Thomas' method	02
2.	Agricultural Efficiency	Methods	1. Kendall's method 2. Bhatia's method	02
3.	Measures of Network Structure	Network indices	1. Ratio measure 2. Alpha, beta, gamma, etc. 3. Associated number, cyclomatric number	01
4.	Lorenz Curve Location quotient	Lorenz Curve Location quotient	Calculation and plotting	02
5.	Use of Logarithmic Graph Papers	Exponential and power functions	1. Plotting of suitable economic data on semi-log graph paper 2. Plotting of suitable economic data on double-log graph paper	02

b. Settlement and Population Geography				
6.	Population Geography	Indices and Projection	1. Age-sex pyramid 2. Child-women ratio 3. Dependency ratio 4. Infant mortality rate 5. Age specific mortality 6. Population growth rate 7. Population projection	03
		Computer Application	Data Analysis and presentation using Computers	05
7.	Settlement Geography	Methods for calculation of Urban data and Dispersion	1. Rank size rule & primate index 2. Calculation of centrality 5. Nearest Neighbor analysis 6. Gravity model	03

Reference Books:

1. Carter Harold (1977): The study of Urban Geography
2. Hans Raj (1978): Fundamentals of Demography
3. Hudson F.S. (1976): Geography of Settlements
4. Michael E. and E. Hurse: Transportation Geography
5. Pollard A. H. and Farhat Yusu: Demographic Techniques
6. Singh, R. L. Reading in Rural Settlement Geography
7. Yeats, M. H. (1974). An introduction to Quantitative Analysis in Human Geography
8. Singh, J. and Dhillon (1984): Agricultural Geography.
9. Liendsor, J. M. (1997): Techniques in Human Geography, Routledge.
10. Lloyd, P. and B. Dicken (1972): Location in Space - A theoretical approach to economic geography.Harper and Row, New York

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 201 **Title: Quantitative Techniques in Geography**

No. of Credits: 03 **Total No. of Periods: 45**

Sr. No.	Topic	Subtopics	Learning Points	Periodds
1.	Geographical data	1. Nature 2. Scales of measurement 3. Types of statistics	1. Spatial and Temporal 2. Discrete and Continuous data 3. Grouped and Ungrouped data Nominal, ordinal, Interval and ratio scales 4. Descriptive and Inferential statistics	3
2.	Descriptive statistics	Analytical methods	Meaning, description and calculation of mean, median, variance, standard deviation, skewness and kurtosis.	6
3	Concept of probability	Methods of Determination	1. Normal probability distribution, 2. Determination of the probability of a continuous random variable event using normal distribution. 3. Determination of the probability of a discrete random event using Binomial and Poisson distributions.	8

4.	Time series analysis	Meaning, and Definition of time series, Methods of analysis	1. Properties of a time series, trends and periodicity. Cyclicity,Persistant increase/decrease 2. Calculation and plotting of running means (3 and 5) 3. Curve fitting by method of least squares.	8
5.	Bivariate analysis	Correlation and Regression	1. Concept of bivariate correlation and regression 2. Calculation of Pearson's product moment correlation coefficient 3. Calculation, plotting and interpretation of linear regression equation 4. Calculation and plotting of Exponential and Power law regression equation 5. Concept of residuals and explained variance	10

6.	Inferential statistics	1. General requirements for conducting an inferential Statistical test 2. Testing of hypothesis	1. Population and sample, Meaning of unbiased random sample 2.Standard error estimates of mean and standard deviation. Meaning and Definition of : 1.Null and Alternative hypothesis. 2. Level of significance (Rejection level) 3. Degrees of freedom 4.. Parametric and Non parametric tests Application of following tests : 1. Non- parametric test, chi squared test, KS test, contingency table b. Using relative frequency table 2. Parametric tests, a Student 't' test (comparison of sample means) b. ANOVA(Analysis of variance) by Snedeeor's 'f' test (one way, two way (single entry))	10

(Note: Use of calculator is allowed at the time of Examination)

Reference Books:

1. Ebdon David (1989). Statistics for Geographers
2. King, (1975). Statistical Geography
3. Norcliffe G.B. (1977). Inferential statistics for Geographers (Hutchinson, London)
4. Rogerson P.A. (2001). Statistical methods for Geography (SAGE pub., London, New Delhi)
5. Shaw G. & Wheller D. (1985). Statistical Techniques in Geographical Analysis, John Wiley & Sons, New York. approach to economic geography.Harper and Row, New York
6. Karlekar Shrikant and Kale Mohan (2006) : Statistical analysis of geographical data, Diamond Publication, Pune

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 210 **Title: Coastal Geomorphology**

No. of Credits: 03 **Total No. of Periods: 45**

Unit Nooooo.	**Topic**	**Subtopics**	**Learning points**	Periods
1.	Introduction	Coastal systems	1. Components of coastal systems processes, sediment transport Morphology, Stratigraphy 2. Spatial and temporal scales in coastal Geomorphology 3. Coastal classification – Genetic and Morphological	3
2.	Coastal Processes	Waves	Definition, wave length, wave height, amplitude, depth, period , fetch, frequency Types of waves, sea waves, swell waves , capillary waves, gravity waves, long period tidal waves, storm waves, Standing waves, Process of shoaling, wave breakers – spilling, plunging and surging, reflection , diffraction and refraction of waves	12
		Currents	Currents – Wave induced shore normal and long shore currents, rip currents , beach drift , wind induced , river induced and tide induced currents, flood and ebb currents	
		Tides	Equilibrium Theory of tides, semidiurnal, diurnal, spring , and neap tides. Amphidromic point, co – tidal lines, coastal tides, tides in bays and estuaries Tides and coastal landforms	

3	Sea level Mechanism of	Mechanism of sea level changes	1.Transgression , Regression, Relative and eustatic sea level change 2.Causes and consequences sea level change Pleistocene sea levels, glacial eustasy, Staircase theory 3. Holocene transgression 4. Future sea levels 5. Indicators of former sea levels: Fossil beach ridges, beach rocks, abandoned cliffs, Caves , raised features , shore platforms	5
4	Coastal sediments	Properties, types and Movement	1.Clastic and biogenic sediments 2. Grain size characteristics 3. Sources sediments: Coastline erosion and sea floor 4. Pathways of sediments transport : Factors affecting Transport , sediments traps and sinks	5
5	Coastal environments	Fluvial-dominated	Coastal deltas: Classification , formation, morphology delta plain, delta front and pro delta Fan delta, Braid delta. Morphodynamics of deltas	5
		Wave-dominated	1.Introduction: Process of deposition 2.Beaches and spits: Profiles, types and sediments 3. Barrier islands 4. Coastal sand dunes, dune systems 5. Sea cliffs and caves- Formation and morphology 6. Shore platforms – Formation types and Morphology 7. Sea arches, stacks , stumps, geos and blow holes	5

		Tide-dominated	1.Introduction 2.Estuaries and mud flats: morphology and Hydrodynamics	3
		Biotic environments	1.Mangroove swamps and salt marshes 2.Corals and coral reefs	2
6.	Applied coastal Geomorphology	Current coastal issues	1. Sea level rise 2. Storm hazard management 3. Coastal erosion 4. Wetlands, Kharlands, Estuarine reclamation 5. Salt intrusion and subsidence of coastal aquifers	5

Reference Books:

1. Davis J L (1980): Geographical variation in coastal development, Longman, New York

2. Embelton and Thornes (1979): Process in geomorphology, Arnold, London

3. Hails J and Carr A (1975): Nearshore sediment dynamics and sedimentation, Wiley, London

4. Karlekar Shrikant (1993): Coastal geomorphology of Konkan, Aparna Publication, Pune

5. Masselink G, Hughes M G (2003): Introduction to coastal processes and geomorphology, Arnold, London

6. Pethick John (1984): An Introduction to coastal geomorphology, Arnold Heinemann, London

7. Tooley M M and Shennan I (1987): Sea level changes, Basil Blackwell, Oxford, U K

8. Bird, E. (2000): Coastal Geomorphology. An Introduction, John Wiley and Sons , Chichester.

9. Kale, V.S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Calcutta.

10. Jog S. R. and Suryawanshi R.S. (2004): Costal Landscape, Global Scientific, Pune

11. Karlekar Shrikant (2009) : Coastal processes and landforms, Diamond publication, Pune

12. BIRD (2009) Coastal Geomorphology: An Introduction

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)
Revised Syllabus (from June,2013)

Code No. Gg: 211 **Title: Synoptic Climatology**
No. of Credits: 03 **Total No. of Periods: 45**

Sr. No	Topics	Subtopics	Learning points	Periods
1.	Introduction	Nature and Scope	Levels of climatological synthesis	1
2.	Approaches	Techniques	1. Analytical approach 2. Synoptic approach	2
3.	Weather analysis	Procedures	1. Observing, reporting, Collecting and displaying systems of weather data by India Meteorological Services. 2. Meteorological code and data exchange 3. Analysis of weather charts	4
4.	Tropical Weather Systems	Tropical Disturbances	1. Types-Easterly waves, Tropical cyclones 2. Easterly waves – formation and characteristics 3. Tropical cyclones - formation, life cycle, structure and dissipation	5
5.	Severe Tropical Weather System	Thunderstorms	1. Thunderstorms – origin, structure stages of development 2. Tornados – development and occurrence, prediction 3. Hurricanes – profile, formation and decay 4. Environmental impact of severe weather	4

6	Extra-Tropical Weather Systems	Air masses and Fronts	1. Air masses of North America Asia and Europe. 2. Types of Fronts-warm, cold, stationary and occluded 3. Frontogenesis and Frontolyses Principle zones of Frontogenesis	4
7	Extra-Tropical cyclones	Wave Cyclone	1. Rossby Waves 2. Life cycle of wave cyclone 3. Idealized weather of a wave cyclone 4. Western disturbances	4
8.	Weather Pattern	Local Weather	1. Clouds – Classification, formation 2. Precipitation – Theories of rain formation 3. Types of precipitation – Convective, Frontal, Orographic 4. Fog – formation process 5. Heat waves and Cold waves.	5
9.	Weather Interpretation	Weather Forecasting	1. Short, medium and long range forecasting 2. Methods of forecasting analogue synoptic and numerical 3. Satellites in weather forecasting	6
10	Application of Synoptic Climatology	Benefits of Weather Forecasting	1. Modeling of pollutant distribution 2. Marine activities 3. Aviation 4. Disaster prevention and preparedness 5. Agriculture and Agro-climatological service	5

Reference Books :

1. Barry and Petty-Synoptic Climatology.
2. Fredrick K.Lutgens and Edward J Tarbuck (1979) –The Atmosphere
3. A.A. Rama Sastry (1984) Weather and Weather forecasting
4. Lestie F Musk (1989) Weather Systems
5. Morris Neiburger (1971)Understanding our Atmospheric
6. James G. Edinger Environment

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 212 **Title: Agricultural Geography**

No. of Credits: 03 **Total No. of Periods: 45**

Topic.No	Topics	Subtopics	Subunits	Periods
1.	Introduction to Agricultural Geography	1. Nature, scope and approaches 2. Origin and dispersal of agriculture	1. Nature scope and significance. 2. Approaches-systematic: commodity, regional, recent.	5
2.	Significance of Agriculture	Place of agriculture in Different Economies	1. Significance of agriculture in world regions 2. Importance of agriculture in the Indian Economy.	4
3.	Determinants of Agricultural Patterns	Influence of Physical, Economic and Technological Factors.	1. Relief, climate, soil 2. Land holding, marketing, transport 3. Irrigation 4. Mechanization. 5. Biochemical inputs	7
4.	Agricultural Types	Subsistence and Commercial agriculture	1. Shifting cultivation 2. Intensive subsistent farming. 3. Mixed farming 4. Plantation agriculture 5. Commercial grain farming	10

5.	Problems & Prospects of Agriculture	Semi-arid & arid regions	1. Definition and characteristics of arid and semi-arid regions. 2. Droughts and famines 3. Role of irrigation and dry farming.	4
6.	Agricultural regionalization	Methods of Regionalization	1. Views of Baker Whittlesey Hann. 2. Crop combination techniques, Weaver and Thomas method. 3. Agricultural efficiency, Kendall's ranking- coefficient, Bhatia's method 4. Agricultural regions of India.	7
7.	Land use	General Land use Agricultural Land use	1. Land use surveys 2. Land Classification in Great Britain and India.	3

Reference Books:

1. Grigg. D.G.(1964) – An Introduction to Agricultural Geography Hutchinson & Co.Ltd.,
2. Morgan. W.B. & S.C. Monton (1971) – Agricultural Geography Methuen, London.
3. Singh. J. and Dhillon S.S. (1994) – Agricultural Geography. Tata McGraw Hill, Publishing Co. Ltd.
4. Symons, Leslie (1970) – Agricultural Geography, G. Belt and Sons Ltd., London.
5. Tarrent, J.R. (1970) – Agricultural Geography, David and Charles, Newton Abbot.
6. Grigg. D.G. (1974) – The Agricultural Systems of the world An Evolutionary Approach.
7. Illbery, B.W. (1985) – Agricultural Geography, Social & Economic Analysis, Oxford University Press.
8. Aiyer, A.K.Y.N.(1949) – Agricultural and Allied Arts in Vedic India.
9. Randhawa, M.S. (1980) – An History of Agriculture in India Vols. I, II, III,IV ICAR, New Delhi.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June, 2013)

Code No. Gg: 213 **Title: Population Geography**

No. of Credits: 03 **Total No. of Periods: 45**

Unit	Unit	**Subunit**	**Learning points**	**Periods**
1.	Introduction	1. Nature and Scope 2 Approaches	1. Definition, nature and scope. 2. Evolution of Population Geography. 3. Recent trends in Population Geography 1.Approaches to the study of Population Geography 2. Population Geography and other disciplines	4
2.	Growth of Population	1. Spatial variation 2. Temporal variation	1. Factors 1. Factors 2. Historical to modern	3
3.	Population Theory	Various theories	1. Malthus Population Theory 2. Marx's Population Theory 3. Optimum Population Theory 4. Demographic Transition Theory.	5
4.	Population Distribution	Distribution of world population.	1.Density of Population 2. Physical factors 3. Socio-economic and Political factors. 4. Demographic factors	4

5.	Fertility	1. Levels and trends of fertility 2. Recent and current fertility differences within countries (developed and developing)	1. Areas of low and high fertility 2. Factors affecting fertility 3. Causes of low & high fertility. 1. Urban Rural status. 2. Educational status 3. Economic status 4. Occupational groups 5. Religious and Ethnic groups	4
6.	Mortality	Levels and trends	1. Recent mortality levels 2. Factors related to High Mortality in the past 3. Foetal and Infant Mortality 4. Factors in mortality trends in developed countries 5. Factors in mortality levels and trends in developing countries.	4
7.	Migration	Definition and Types	1. Definition Types- inter-regional, inter-state, rural-urban, international. 2. Causes and consequences of migration. 3. Lee's Theory of Migration 4. Laws of migration.	4
8.	Population Composition	Various compositions	1. Sex ratio and sex composition. 2. Age composition 3. Age and Sex pyramid 4. Literacy 5. Economic 6. Occupation composition 7. Urban and Rural 8. Religion 9. Language	4

9.	Population projection	Population projections in historical perspective	1. Use of population projections in planning. 2. Industrial development 3. Agricultural development 4. Education 5. Health 6. Housing. 7. Regional and Urban development 8. Regional and World projections.	4
10.	Population Policies	Population Policies – Post - World War II	1. Population policies after World War II 2. Population policies – with special reference to India	4

Reference Books:

1. Agarwala, S.N. : India's population Problems, Tata McGraw Hill publishing Co. Ltd. , New Delhi.1977
2. Bose Ashis et.al. :Population in India's Development Vikas Publishing House, New Delhi, 1974.
3. Chandna R.C.:Geography of Population : concepts, Determinants and Patterns, Kalyani Publishers, New Delhi,1986.
4. Clarke J.I : Population Geography, Pergamon Press, Oxford,1973.
5. Clarke J.I. (Ed) :Geography and Population -Approaches and Applications, Pergamon Press.Oxford 1984.
6. Crook Nigel :Principles of Population and Development, Pergamon Press New York, 1997.
7. Garnier B.J. :Geography of Population, Longman, London, 1970.
8. Pathak, K.B. and F.Ram : Techniques of Demographic analysis. Bombay: Himalaya Publishing house. 1992.
9. Sundaram K.V. and Sudesh Nangia (Ed): Population Geography, Heritage Publications, Delhi,1986.
10. U N D P: Human Development Report, Oxford, 2002.
11. Woods R.: Population Analysis in Geography, Longman, London, 1970.
12. Zelinsky Wilbur : A Prologue to Population Geography Prentice Hall, 1966.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 220 **Title: Fluvial Geomorphology**

No. of Credits: 03 **Total No. of Periods: 45**

Sr. No	Topic	Subtopics	Learning Points	Periods
1.	Introduction to Fluvial Geomorphology	1. Fluvial geomorphology 2. Drainage basin and stream network	1. Definition and scope 1.The Drainage basin as a geomorphic unit 2. Glock's model 3. Horton's laws of drainage composition 4. Laws of allometric growth	4
2.	Mechanics of Fluvial Erosion	Overland flow, Through flow and Channel flow	1. Surface and subsurface wash 2. Horton overland flow 3. Belt-of-no-erosion	5
3.	Open channel Hydraulics	1. Types of flows; Regimes of flow; Stream energy	1. Laminar and turbulent 2. Uniform and non-uniform 3. Steady and unsteady 4. Isovels 5. Shear stress and stream power	4
4.	Hydraulic Geometry	1. At-a-station 2. Downstream	1. Relation of discharge with width, depth, velocity and gradient	4

5.	Sediment Transport	1. Entrainment 2. Model of sediment transport 3. Sediment load and yield	1. Capacity and Competence 2. Tractive force 3. Suspended and bedload	3
6.	Channel Morphology	1. Cross section morphology and Reach morphology 2. Channel patterns 3. Channel types 5. Concept of Grade	1. Form ratio, channel capacity, wetted perimeter, hydraulic radius, gradient 2. Meandering, braided and anabranching channel patterns 3. Gradient and variation in bed and bank material and discharge 4. Sand bed, gravel bed and bedrock channels 5. Long profile: below, near and above grade conditions	07
7.	Fluvial Erosion	1. Types of erosion and erosive Processes; factors 2. Erosional features	1. Vertical, lateral and headword erosion 2. Abrasion, cavitations and attrition 3. Erosional features : gorges, canyon waterfalls, potholes, etc.	05
8.	Fluvial Deposition	1. Fluvial landforms 2. River terraces	1. Alluvial fans, flood plains and associated features 2. Terraces : types and combinations	05
9.	River vegetation	Bed and bank vegetation	1. Types and locations of bed vegetation 2. Riparian vegetation	03

10.	River Metamorphosis	Definition, environmental change	1. Long-term and Short-term adjustments 2. Quaternary fluvial systems	5

Reference Books:

1. Leopold, L. B., Wolman, M. G. and Miller, P. (1954) Fluvial processes in Geomorphology, Freeman and Co. San Francisco.
2. Schumm, S. A. (1977). Fluvial Systems. Wiley, New York.
3. Richards, K. (1982). River: Forms and processes in alluvial channels. Methuen and Co. London
4. Morisawa, M. (1985). Rivers: Forms and Processes, Longman
5. Dr. Kale, V. S. and Gupta, A. (2001). Introduction to Geomorphology, Orient Longman, Kolkata.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 221 **Title: Monsoon Climatology**

No. of Credits: 03 **Total No. of Periods: 45**

Unit	Unit	Subunit	Learning points	Periods
1.	Introduction	Background	1.Development of Monsoon climatology 2. Definition 3. Environmental and economic importance	2
2.	Origin of Monsoon	Concepts	1.Thermal 2. Aerological 3. Fohn's concept	3
3.	The Asian Monsoon	Regional aspects	1. Monsoon of East Asia 2. Monsoon of South Asia	4
4.	Indian Monsoon	Theories	1. Classical theory of Indian Monsoon 2. Summer Monsoon 3. Winter Monsoon	4
5.	Monsoon Model	Driving Mechanism	1. Differential heating of land and sea 2. Compressibility of atmosphere 3. Effects of rotation and moisture 4. Annual cycle of Summer Monsoon	6

6.	Features of Summer Monsoon	Monsoon Climatology	1. Sea level pressure patterns – The heat low , Monsoon trough 2. Surface winds and upper winds. 3. Temperature at the surface and aloft.	6
7.	Regional aspects	1. Monsoon season 2. Main Rain bearing systems 3. Semi-permanent system	1. On-set of Monsoon 2. Withdrawal of Monsoon 1. Monsoon depressions 2. Mid-troposphere cyclone 3. Off-shore trough along west coast of India 1. Easterly Jet 2. Tibetan Anticyclone	8
8.	Monsoon variability	Rainfall	1. Intra-seasonal Active and break Monsoon situations 2. Inter – Annual – Drought and floods 3. Decadal and Centurial – long period trends in Indian rainfall	4
9.	Teleconnection	Nino Regions	1. ENSO 2. Walker circulation 3. Eurasian snow cover 4. Role of Ocean and upper atmosphere	4

10.	Forecasting	Different time scales	1. Historical perspective 2. Features of the predictors 3. Regional conditions 4.ENSO Indicators 5.Cross equatorial flow 6. Global/hemispheric conditions 7.Parametric and Multiple power regression model	4

Reference Books :

1. G.B.Pant and Rupa Kumar (1997) -Climates of South Asia
2. Y.P.Rao (1976) -Meteorological Monograph Synoptic Meteorology No- 1 Southwest Monsoon.
3. P.K.Das (1968) - The Monsoon.
4. K.N.Keshavamurthy (1992) - The Physics of Monsoon
5. Jay S. Fein Pamela - Monsoon

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June, 2013)

Code No. Gg: 222 **Title: Industrial Geography**

No. of Credits: 03 **Total No. of Periods: 45**

Unit No	Unit	Subunit	Learning points	Periods
1	Introduction	Basic concepts	1.Definition, Nature, Scope 2. Manufacturing and Regional economics	3
2.	Industrial Location	1. Location factors 2. Centralization and Decentralization	1. Geographical 2. Economical 3. Political 4. Socio-cultural 1. Characteristics of centralization 2. Characteristics of decentralization	5
3.	Models and concept	1. Application of models	1. Weber's model 2. Losch's model 3.Greenhut's model 4. Israd's model 5. Agglomeration of industries 6.Industrial Linkages	10
4.	Locational Analysis and distribution	Changing pattern and Distribution of industries	1. Iron and steel 2. Cotton textile 3. Automobile 4. Chemical	10

5.	Industrial regions	Definition, problems and prospects	Study of two industrial regions in 1. Western Europe 2. Anglo-America 3. Japan	8
6.	Industrial regions of India	Definition, problems and prospects	1. Nature of industrial regions in India 2. Regional development of Industries 3. Locational factors for industries 4. Characteristics of industrial regions	5
7.	Recent trends in manufacturing	IT industries	1. Nature of software industry 2. Role of software industry in India 3. Problems and Prospects	4

Reference Books:

1. Alexaderson, G. (1967) : “Geography of Manufacturing”, Prentice Hall, New Jersey
2. Alexander, J.W. (1973) : “ Economic Geography”, Prentice Hall, New Jersey
3. Estall and Buchanan (1969) : “Industrial Activity and Economic Geography”
4. Smith, David, M, (1971) : “Industrial Location- An Economic Geographical Analysis”, John Wiley and Son, New York.
5. Miller, E.C. (1977) : “Manufacturing-A study of Industrial Location”, Penn State University, University Park, U.S.A.
6. Shaw, E.B. (1979) : “An Anglo-America- A Regional Geography”
7. Riley, R.C. (1973) : Industrial Geography, Progress Publication, Moscow
8. Watts, H.D. (1989) : Industrial Geography, Longman Group Ltd. Hong Kong
9. Carlo Ghezzi, Mehdi Jazayeri and Dino Mandriali (2003) : Fundamentals of Software Engineering” , Pearson Edu. Pte. Ltd. New Delhi
10. Richard, E. Fairley ( ) : “Software Engineering- Concepts” Tata Mc-Graw Hill Publishing Company, New Delhi.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 223 **Title: Geography of Rural Settlement**

No. of Credits: 03 **Total No. of Periods: 45**

Unit No	Unit	Subunits	Learning points	Periods
1.	Introduction	1.Definition and Evolution of settlements 2. Place names	1 Definition in different parts of the world 2 Sequence of occupancy from Neolithic 3. Modern periods. 1. Historical 2. Cultural and Geographical aspects of settlements reflected in place names.	2
2.	Growth and Distribution	1. Site, situation, location 2. Growth of Settlements	1. Various factors affecting settlement site and distribution 2. Depression and nucleation, factors affecting dispersion and nucleation- Methods of the measuring degree of dispersion. 1. Factors affecting growth of settlements- 2.System of land division, water rights system of agriculture, land tenancy system	4
3.	Theories of Rural Land Use	1. Factors Affecting 2.Theories	1.Intensity of Land use 2. Labour cost 3. Marketing of product 1.Von Thunen 2. Ricardo	6

4.	Rural Economic Activities	Rural Service Centers	1.Functional analysis of service village and Trading Center 2. Centrality and Hierarchy of Rural Service centers 3. Central Place Theory.	8
5	Morphogenesis of Rural Settlements and Transformation	1. Morphogenesis 2. Functional growth	1. Social 2. Cultural 3. Economic organization within villages. 1. Functional growth 2. Socio-economic transformation in rural areas.	6
6.	Demographic Characteristics of Rural Settlement	1.Demographic aspects 2. Migration	1. Age-Sex, Education, Occupation, Caste 1. Causes & Consequence of migration in rural areas 2. Seasonal migration. 3. Commuting patterns	6
7.	Rural House Types	Analysis of rural house types	1. Primitive, Vernacular and Modern high rise 2. Physical, Social, Cultural and Economic factors affecting rural house types. 3. Size, functional use and architectural style. 4. Building material	6
8.	Rural Settlements in Maharashtra	1. Patterns 2. House types 3. Rural transformation	1. Various patterns 2. House types and Settlement patterns in Maharashtra 3. Modern forms of rural settlements	4

9.	Rural Development Planning	Various aspects of rural planning	1. Land use 2. Transport 3. Amenities 4. Population 5. Environment and water	3

Reference Books:

1. Alam S.M. et.al. :Settlement System of India Oxford and IBH PublicationCo., New Delhi 1982.
2. Chisholm M. : Rural Settlement and Land use. John Wiley, New York , 1967
3. Clout H.D.: Rural Geography , Pergamon , Oxford, 1977.
4. Doniel P and Hopkinson M : The Geography of settlement Oliver & Byod, Edinburgh, 1986.
5. Grover N. Rural Settlement – A Cultural Geographical Analysis. Inter India Publication, Delhi, 1985
6. Hudson F.S. :A Geography of Settlements. Macdonald and Evans, New York, 1976.
7. Ramchandran H.: Village clusters and Rural Development. Concept Publication, New Delhi, 1985
8. Rao R.N.. Strategy for Integrated Rural Development. B.R. Publication, Delhi, 1986.
9. Rapoport A. House Form and Culture, Prentice Hall, New Jersey, 1969
10. Sen L.K.(ed) Readings in Micro-level Planning and Rural Growth Centers, National Institute of Community Development, Hyderabad. 1972.
11. Srinivas M.N: Village India, Asia Publication House, Bombay,1968.
12. Wanmati S.: Service Centers in Rural India, B.R. Publication Corporation , Delhi, 1983.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 202 **Title: Practicals in Cartography**

No. of Credits: 02 **Total No. of Practicals: 15**

Sr. No.	Topic	Subtopics	Learning Points	Practicals (2 hours duration)
1.	Data	Types	Scales of Data Measurement	1
2.	Data representation by various techniques **-I**	Maps Diagrams	Choropleth, Isopleth, Dot 2 & 3 Dimensional diagrams: Circle, Square, Pie chart Sphere, Cube	1 2
3.	Data representation by various techniques **-II**	Plots	Semi log and log on X, Y axis X Y Z plots with Whisker & Box method Scatter diagram, Residual from regression, mapping of residuals	2
4.	Map projections	Fundamental concepts	1.Definition and necessity of projections 2. Developable and non - developable surfaces 3. Types- Perspective and non- perspective, conventional 4. Classification based on i) Developable surfaces used ii) Position of source of light iii) Properties	1

5.	Construction	Graphical construction	Graphical construction and uses of following projections 1.Polyconic projection 2. International map projection (Modified polyconic) 3. Universal Transverse Mercator (UTM) projection 4. Mollweide projection.	8

Reference Books :

1. Saha P.& Basu P. Advanced Practical Geography 2007, Books and Allied (P) Ltd. Kolkatta
2. Singh & Kanujia : Map work and Practical Geography.
3. Richardus P., Adler Ron K.: Map projections, 1972, North Holland publ. Co.Amsterdam
4. Maling D.H. ,1973 Co ordinate systems and map projections, George Philip, London.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 203 **Title: Practicals in Surveying and Field Visit**

No. of Credits: 03 **Total No. of Practicals: 15**

Sr. No	Topic	Subtopics	Learning Points	Periods
1.	Surveying	Geodetic and plane Survey Terms used in leveling Leveling staff	Definitions and methods Benchmarks, spot heights, reduced levels, interpolation and contouring Types of staves	01
2.	Dumpy level	The Instrument	Various components, Common terms used in dumpy level survey, adjustments in dumpy level	01
3.	Dumpy level	Methods of computation Field survey methods	Collimation method Rise and Fall method Profile drawing Block contouring	05
4.	Transit Theodolite	The instrument	Various components, Least count of instrument, adjustments in thedolite	01
5.	Theodolite	Surveying & plotting	Intersection method Tacheometric method	05

6.	Field visit	Survey of a selected field	Detailed Dumpy level/Theodolite survey of a selected field (Coastal beach, River profiling, village plan map), Report writing	02

Reference Books :

1. Singh & Kanujia : Map work and Practical Geography.
2. Maslov A.V. Gordeev A.V.,Batrakov Yu.G. Geodetic surveying,1984, Mir Publishers, Moscow
3. Kanetakar T.P. & Kukarni S.V. 1986. Surveying & leveling, Pune Vidyarthi Griha Prakshan, Pune
4. V. Natarajan P., Adler Ron K. Advanced Surveying, B.1 Publ. Bombay
5. Richardus P., Adler Ron K.: Map projections, 1972, North Holland publ. Co.Amsterdam
6. Maling D.H. ,1973 Co ordinate systems and map projections, George Philip, London.
7. Rangwala S.C. 2011. Surveying and Leveling, Charotar Publishing HousePvt. Ltd. Anand,(GJ)

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 204 **Title: Geography of Tourism**

No. of Credits: 03 **Total No. of Periods: 45**

Sr. No	Topic	Subtopics	Learning Points	Periods
1	Basics of tourism:,	Definition of tourism	Factors influencing tourism: historical, natural, socio-cultural and economic; motivating factors for pilgrimages: leisure, recreation; elements of	4
2	Geography of tourism:	its spatial affinity; areal and locational dimensions comprising physical, cultural, historical and economic;	Tourism types: cultural, eco – ethno coastal And adventure tourism, national and international tourism; globalization and tourism.	6
3	Indian Tourism	regional dimensions	tourist attraction; evolution of tourism, promotion of tourism. Case studies from India	15
4	Infrastructure and support system	accommodation and supplementary accommodation; other facilities	Tourism circuits-short and longer Detraction - Agencies and intermediacies - Indian hotel industry.	15
5	Impacts of tourism:	physical, economic and social and perceptional positive and negative impacts;	Environmental laws and tourism-Current trends, spatial patterns and recent changes; Role of foreign capital & impact of globalization on tourism	15

1. Bhatia A.K. : Tourism Development: Principles and Practices. Sterling Publishers, New Delhi (1996)
2. Bhatiya, A.K. International Tourism - Fundamentals and Practices, Sterling, New Delhi, (1991)
3. Chandra R.H.: Hill Tourism: Planning and Development, Kanishka Publishers, NewDelhi, (1998)
4. Hunter C and Green H: Tourism and the Environment: A Sustainable Relationship, Routledge, London, (1995)
5. Inskeep. E : Tourism Planning: An Integrated and Sustainable Development Approach, Van Nostrand and Reinhold, New York, (1991)
6. Kaul R.K. Dynamics of Tourism & Recreation. Inter-India, New Delhi. (1985).
7. Kaur J. : Himalayan Pilgrimages & New Tourism Himalayan Books, New Delhi, (1985)
8. Lea J.: Tourism and Development in the Third World, Routledge, London, (1988)
9. Milton D.: Geography of World Tourism Prentice. Hall, New York, (1993)
10. Pearce D.G.: Tourism To-day: A Geographical Analysis, Harlow, Longman, (1987)
11. Pratap R. & Prasad K. Tourism Geography, Shree Publishers & Distributors , New Delhi. (2005)
12. Robinson, H. A Geography of Tourism. Macdonald and Evans, London, (1996)
13. Sharma J.K. (ed.) : Tourism Planning and Development - A new perspective, KanishkaPublishers, New Delhi, (2000)
14. Suryawanshi R. S.: Assessment of Potential for Eco- Tourism, Northern Thane District, Maharashtra. Lap Lambert Academic Publishing, Germany (2012)
15. Shaw G. and Williams A.M. : Critical issues in Tourism-A Geographical Perspective, Oxford: Blackwell,(1994)
16. Sinha P. C. (ed.) : Tourism Impact Assessment, Anmol Publishers, New Delhi, (1998)
17. Theobald W. (ed.) : Global Tourism: The Next decade, Oxford, Butterworth, Heinemann, Oxford,(1994)
18. Voase R. : Tourism: The Human Perspective Hodder & Stoughton, London, (1995)
19. Williams A.M. and Shaw G. (eds.): Tourism and Economic Development - WesternEuropean Experiences, Belhaven, London.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 205 **Title: Geography of Disaster Management**

No. of Credits: 03 **Total No. of Periods: 45**

Sr. No	Topic	Subtopics	Learning Points	Periods
1.	Introduction	Concepts and definitions	Disaster, Hazard, Vulnerability, Resilience, Risks	5
2.	Classification of Disasters	Causes and types	Natural Disasters Earth quakes, Volcano, Landslide, Tsunami, Cyclones, Floods, Droughts Man-made disaster Fire, Terrorism, Food poisoning, strike and lockouts, accidents, fair and festivals, stampedes.	8
3.	Impacts of Disasters	Impacts	Social, Economic, political, environmental, health, psychological Differential impacts: Caste, class, gender, age, location, disability	6

4.	Trends	Global	Urban disasters, Pandemics, complex emergencies, Climate change	6
5.	Disaster management	Disaster cycle Preparedness & Mitigation	Phases of disaster cycle i. Factors of Disaster Management. ii. First Aid. iii. Role of Civilians and NGO'S in Natural & man- made Calamities. iv. Home guard. v. Role of Armed forces in Natural man- made Calamities. vi. Role of Para-Military forces in Natural man- made Calamities. vii. Role of Police forces in Natural man- made Calamities	10
6.	Technologies for Disaster Management	Technologies	Role of IT in Disaster Preparedness Remote Sensing, GIS and GPS Use and Application of Emerging Technologies Application of Modern Technologies for the Emergency communication. · Application and use of ICST for different disasters.	8
7.	Disasters in India	Disasters and management	Various disasters in India and their management issues	2

Reference Books :

1. Turk J. (1985) : Introduction to Environmental Studies, Saunders, College Publication, Japan
2. Singh Savindra (2000) : Environmental Geography, Parag Pustak Bhavan, Allahabad
3. Morrisawa M (Ed) (1994) : Geomorphology and Natural Hazards, Elsevier, Amsterdam
4. Hart M. G. (1986) : Geomorphology, Pure and Applied, George Allen and Unwin, London
5. Valdiya K. S. (1987) : Environmental Geology, Tata McGraw Hill, New Delhi
6. Bryant Edward (2000) : Natural Hazards, Cambridge University Press
7. Daly Herman E. (1996) : Beyond Growth, Beacon Press, Boston
8. Daly Herman E and Twonseed Keneth N (Ed) (1993) : Valuing the earth – Economics, Ecology and Ethics, MIT Press, London
9. Agarwal Anil and Narain Sunita (Ed) (1999) : State of India's Environment The Citizens Report, Centre for Science and Environment, New Delhi
10. Rangachari R, Sengupta Nirmal, et al (2000) : WCD Case Study Large Dams : India's Experience Final Report, Secretariate of World Commission on Dams
11. Dupont, R.R. Baxter, T.E. and Theodore, L. (1998) : Environmental Management :- Problems and Solutions, CRC Press
12. Smith, K. (2001) : Environmental Hazards : Assessing Risk and Reducing Disaster, Routledge

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)
Revised Syllabus (from June,2013)

Code No. Gg: 206 **Title: Geography of Energy Resources**
No. of Credits: 03 **Total No. of Periods: 45**

Sr. No.	Topic	Subtopics	Learning Points	Periods
1.	Energy Resources: an introduction	Energy for livelihood and energy for activity Concept of primary and secondary energy sources	Definitions ,Types and Forms of energy material based and process based energy resources.	04
2.	Energy development and environment	historical background of energy use and development;	global scenario of energy requirement since Industrial revolution period to the present: Issue related to energy use and environment, case studies of developed and developing countries	05
3.	Geopolitics of Energy:-	Reserves, production and consumption patterns of coal, natural gas, oil, nuclear, hydroelectricity and other renewable energy resources	Issues related to trade, energy crises and various related treatise and agreements.	06
4.	Energy in India:-	Sectoral and temporal pattern of energy consumption	in agriculture, transport and industries; Spatial pattern of energy use with reference to different States and rural and urban areas, metropolitan cities; energy needs.	10

5.	Planning of energy requirement in the country and mitigation of energy crises	Various energy related agreements of India with other countries. Present status	Institutional arrangements, policy models and energy management process in India.	10
6.	Energy Conservation:-	Future prospects and protections of global energy trends and problems;	methods of energy conservation; traditional vs. modern, energy management and sustainable development; potential zones of energy conservation.	10

References

1. Blowers, Andrews, 'Planning for a sustainable Environment,' 1993, Earthscan Publication, London.
2. Chapman, J.D.: Geography and Energy: Commercial energy systems and National Policies, Longman Scientific & Technical Publication, USA, 1989.
3. Essam EL. Hinnawi: The Environmental Impacts of Productions and use of Energy: Nairobi: U.N. Environmental Programme (UNEP), 1981.
4. Goldemberd, Jose: Energy environment and Development; Earthscan publications, U.K., 1996
5. Ion, D.C. : Availability of World Energy Resources, Great and Tretnon Ltd. London, 1980.
6. Kursunoglu, B.N. et.al. (ed.): A Global View of Energy: Lexington Books, 1982.
7. Mahajan, V.S. (ed.): National Energy, Policies, Crisis and Growth: Ashish Publication, New Delhi, 1991.
8. O 'Dell, P.R : Energy Needs and Resources, McMillan, London, 1977.
9. Pachauri, R.K. (ed.) Energy Policy in India An Interdisciplinary Analysis, Mac Millian, London, 1985.
10. Planning Commission, Ninth Five Year Plan, New Delhi,1997 .
11. Read, P: 'Responding to Global Warming: the Technology, Economics and Politics of Sustainable Energy; Zed book Ltd., London and New Jersey, 1994.
12. Schumacher, D: Energy Crisis or Opportunity: An Introduction to Energy Studies: Mac Millian, London 1985
13. Soussan, J: 1988, ' Primary Resources and Energy in the Third World', Routledge Publications, London, 1998.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 207 **Title: Practicals in Terrain Analysis**

No. of Credits: 03 **Total No. of Periods: 45**

Sr. No	Topic	Subtopics	Learning Points	Periods
1.	Data sources	Topographic Map Aerial Photographs Satellite images	Construction of Superimposed ,Projected and Composite profiled from contours –its interpretation and preparation of elevation map of the area Stereoscope view and calculation of % overlapped area- Measurements with parallax bar of same area IRS data products, mapping and interpretation	10
2.	Spatial Terrain maps	Slope, Relative relief and %dissection Index	Preparation of Slope, Relative relief and %dissection Index and area measurement under each category	10
3.	Relationship between terrain parameters	Slope, Relative relief and %dissection Index	Matrix calculation of area under Slope, Relative relief and %dissection Index And preparation of observation table	08
4	Thalweg Analysis	Long profiles	Construction and interpretation of long profiles of rivers	02
5.	Digital Terrain analysis I	Preparation of DEM from contours and point elevation data	Preparation of Grid elevation data TIN model and interpolation of Grid 3 D perspective views and view shed analysis	05

6.	Digital Terrain analysis II	Digital Terrain analysis using GIS softwares	Determination of Primary attributes any 4	05
7.	Digital Terrain analysis III	Digital Terrain analysis using GIS softwares	Determination of Secondary attributes any 4	05

References

1. Brändli, M., 1997. Modelle und Methoden für die Extraktion geomorphologischer und hydrologischer Objekte aus digitalen Geländemodellen. Unpublished . Geographisches Institut der Universität Zürich.
2. Burrough, P. A., McDonnell, R. A., 1998. Principles of Geographical Information Systems. New York: Oxford University Press.
3. Chilès, J., Delfiner, P., 1999. Geostatistics: Modeling Spatial Uncertainty. New York: John Wiley and Sons.
4. Foley, J.D., van Dam, A., Feiner, S.K., Hughes, J.F., 1992. Computer Graphics: Principles and Practice. Reading: Addison-Wesley. [Second Edition, Revised Fifth Printing.]
5. Goodchild, M.F., 1980. Algorithm 9: Simulation of Autocorrelation for Aggregate Data. Environment and Planning, 12, 1073-1081.
6. Kotz, S., Johnson, N. L., 1985. Encyclopedia of Statistical Sciences. New York: John Wiley and Sons.
7. Longley, Paul A., Goodchild, Michael F., Maguire, David J., Rhind, David W., 1999. Geographical Information Systems. Principles, techniques, applications and management. New York: John Wiley and Sons. [2 volumes. 580 pages. 2nd edition]
8. Moore, I. D., 1996. Hydrological Modeling and GIS. In: M. F. Goodchild, L. T. Steyaert, B. O. Parks, C. Johnston, D. Maidment, M. Crane, and S. Glendinning, ed. GIS and Environmental Modeling: Progress and Research Issues. Fort Collins, Colorado: GIS World Books.
9. Quinn, P., Beven, K., Chevalier, P., Planchon, O., 1991. The Prediction of Hillslope Flow Paths for Distributed Hydrological Modelling Using Digital Terrain Models. Hydrological Processes, 5(1), 59-79.
10. Sigle, M., Hellwich, O., Köstli, A., 1992. Intersection and Combination of Digital Elevation Models - Methods and Applications. International Archives of Photogrammetry and Remote Sensing, 29(B4), 878-882.
11. Sutherland, I.E., Sproull, R.F., Schumacker, R.A., 1974. A Characterization of Ten Hidden-Surface Algorithms. ACM Computing Surveys, 6(1), 1-55.
12. Wilson, J. , Gallant, J., 2000. Terrain Analysis: Principles and Applications. New York: John Wiley and Sons.
13. Yoeli, P., 1985. The Making of Intervisibility Maps with Computer and Plotter. Cartographica, 22(3), 88-103.

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June, 2013)

Code No. Gg: 208 **Title: Geoinformatics - I**

No. of Credits: 03 **Total No. of Periods: 45**

Sr. No	Topic	Subtopics	Learning Points	Periods
1.	Introduction to GIS	Basics of GIS	Definition, Potential of GIS, Concept of space & time, Spatial Information Theory, History of GIS, Objectives of GIS, Elements of GIS, Hardware & software requirements, GIS applications, GIS tasks – Input, Manipulation, Management, Query & Analysis, Visualization	10
2.	Database	Spatial Non-spatial	Spatial relationship, Functional Relationship, Logical relationship Nominal, Ordinal, Ratio and Cyclic	5
3.	Data Models	Spatial Non-spatial	Geometric primitives, Raster, Vector, Quadtree Tessellation, Comparative overview of raster and vector models, Layers and Coverage DBMS: Advantages, Conceptual models, Implementational models – Hierarchical, Network and Relational	10
4.	Structuring of spatial data	Digitizing	Digitizers: Manual, Semi-automatic & Automatic Editing: Error Detection & Correction Topology Building	8
5.	Data Analysis (I)	Attribute databases	Operations from Algebraic Theory, Operations from Set Theory SQL: Attribute Query	6

6.	Data Analysis (II)	Spatial databases	Map Algebra, Grid Operations: Local, Focal SQL: Spatial Query	6

Reference Books:

1. P. A. Burrough and R. A. McDonnell, Principles of Geographical Information System, 2000, Oxford University Press.
2. C.P.Lo and AlbertK. W. Yeung, Concepts and Techniques of Geographic Information System, 2002Prentice –Hall, India.
3. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D.W. Rhind, Introduction to Geographic Information Systems and Science, 2002, John Wiley and Sons Ltd.
4. Kang – tsung – Chang, Introduction to Geographical Information System, 2002, McGraw Hill.
5. George Joseph, Fundamentals of Remote Sensing, 2004, Universities Press Pvt. Ltd., Hyderabad.
6. J.R. Jensen, Remote Sensing of Environment, An Earth Resource Perspective, 2003, Pearson Education Pvt. Ltd., New Delhi.
7. Lillesand T.M. and Kiefer R.W., 2002, Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
8. Heywood I, (el.) An Introduction to Geographical Information Systems , Pearson (2011)

UNIVERSITY OF PUNE

MA/MSC Syllabus in Geography (credit system)

Revised Syllabus (from June,2013)

Code No. Gg: 209 **Title: Geoinformatics II**

No. of Credits: 03 **Total No. of Periods: 45**

Sr No.	Topics	Sub Topics	Learning Points	Periods
1.	Data sources	1. Primary and Secondary	1. Fieldwork and Surveys 2. Published data and Reports and maps 3. Remotely sensed data 4. GPS coordinates	2
2.	Introduction to Remote Sensing (RS)	Principles of RS EMR	1. Definition, Historical Perspective-National & International Scenario 2. Spectrum, Spectral Quantities, Theories of EMR, Laws of Radiation, Concept of Blackbody radiation , Spectral Signatures	5
3.	Interaction of EMR	Atmosphere and Surface	1. Scattering, Absorption, Refraction, Path Radiance Reflection, Transmission, Absorption Scattering 2. Surfaces, Atmospheric Windows and Types of RS	6
4.	Aerial Photography	Basics of Aerial Photography Ariel Camera	1. Scale, Resolution, Projection, Flight Planning, Overlaps 2. Optical accepts – Spherical Aberrations, Astigmation, Chromatic Aberrations Components of camera	8
5.	Aerial Photography (AP)	Measurement	1. Geometric characteristics of AP, Measurement of scale and height on AP	5

6.	Satellite RS	Platforms Orbits Scanning Sensors	1. Group – base , Air-borne, Space- borne 2. Geosynchronous, Sun synchronous 3. Across- track and Along –track 4. Spectral, Spatial, Radiometric and Temporal characteristics, Types of Sensor – LANDSAT: MSS, TM, ETM, SPOT,: HRV, IRS : LISS,PAN, WiFS, OCM	8
7.	Data Products	Types	1. Reference Scheme, Photographic Products, 2. Digital Products: Data Formats	4
8.	Visual Interpretation	Elements	1. Factors governing the interpretability 2. Elements of Interpretation of satellite images and aerial photographs	3
9.	GPS	1. Fundamental Concepts 2. Receivers	1. Space Segment, Control segment and User Segment 1. Components and Types, GSP Signals	4

Reference Books:

1 P.A. Burroughs and R.A. McDonnell, Principles of Geographical Information System, 2002, Oxford University Press.
2 C.P.Lo and AlbertK. W. Yeung, Concepts and Techniques of Geographic Information System, 2002Prentice Hall, India
3 Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D W. Rhind, Introduction to Geographic Information Systems and Science, 2002, John Wiley and Sons Ltd.
4 Kang- tsung-Chang, Introduction to Geographical Information System, 2002, McGraw Hill.
5 George Joseph, Fundamentals of Remote Sensing, 2004, Universities Press Pvt. Ltd., Hyderabad.
6 J. R. Jensen, Remote Sensing of Environment, An Earth Resource Perspective, 2003, Pearson Education Pvt. Ltd., New Delhi.
7 Lillesand T.M. and Kiefer R. W., 2002, Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.