

UNIVERSITY OF PUNE
Revised structure of B.Sc. Geography to be effective from June, 2008

F.Y.B.Sc. – June, 2008

S.Y.B.Sc. – June, 2009

T.Y.B.Sc. – June, 2010

F.Y.B.Sc.		
Gg-110	Paper I	Physical Geography
Gg-120	Paper II	Geography of Atmosphere & Hydrosphere
Gg-101	Paper III	Techniques in Physical Geography

S.Y.B.Sc.		
Gg-211 (Sem. 1 st)	Paper I	Fundamentals of Geography of Resources
Gg-221 (Sem. 2 nd)	Paper I	Distribution, Development and Planning of Resources
Gg-212 (Sem. 1 st)	Paper II	Introduction to Hydrology
Gg-222 (Sem. 2 nd)	Paper II	Surface and Groundwater Hydrology
Gg-201	Paper III	Map Projections & Surveying

T.Y.B.Sc.		
Gg-331	Paper I	Principles and Techniques of Watershed Management
Gg-341	Paper II	Principles and Techniques of Watershed Management
Gg-332	Paper III	Geography of Travel and Tourism
Gg-342	Paper IV	Geography of Travel and Tourism
Gg-333	Paper V	Fundamentals of Geoinformatics – Paper I
Gg-343	Paper VI	Fundamentals of Geoinformatics – Paper I
Gg-334	Paper VII	India : A Geographical Analysis
Gg-344	Paper VIII	India : A Geographical Analysis
Gg-335	Paper IX	Geography of Soils – Paper I
Gg-345	Paper X	Geography of Soils – Paper II
Gg-336	Paper XI	Fundamentals of Geoinformatics - Part II
Gg-346	Paper XII	Fundamentals of Geoinformatics - Part II
Gg-347	Paper I	Map Analysis and Field Work
Gg-348	Paper II	Techniques of Spatial Analysis
Gg-349	Paper III	Techniques of Geomorphology

Equivalence of T.Y.B.Sc Geography Syllabus

	Old Syllabus	New Syllabus
Gg-331 Paper I	Resources and techniques in	Principles and
Gg-342 Paper II	Environment management	water Shed
Gg-332 Paper III	Geography of and	Geography of Travel
Gg-342 Paper IV	Tourism	Tourism
Gg-333 Paper V	Fundamentals of	Fundamentals of Geo-
Gg-343 Paper VI	GIS	Informatics Part-I
Gg-334 Paper VII	Geography of	India: Geographical
Gg-344 Paper VIII	India	Analysis
Gg-335 Paper IX	Geography of	Geography of
Gg-345 Paper X	Soil	soils
Gg-336 Paper XI	Remote	Fundamentals of Geo-
Gg-346 Paper XII	Sensing	Informatics Part-II
Gg-347 Paper I	Study of Toposheets Project work and Excursion	Map Analysis and Field Work
Gg-348 Paper II	Cartographic Techniques And Statistical methods	Techniques and Spatial Analysis
Gg-349 Paper III	Practical in Geomorphology And Soil analysis	Techniques in Geomorphology

UNIVERSITY OF PUNE

T.Y., B.Sc.

Gg 331: Principles and Techniques of Watershed Management - Paper 1

(Semester III)

From June 2010

- Objectives:**
1. To acquaint the students with concepts in Watershed Management.
 2. To familiarize the students with the importance of Watershed Management.

Sr. No.	Topics	Periods
1.	Concept of watershed management : Definition, Principals, objectives, Need of watershed management, Identification of problems in watershed management.	8
2.	Characteristics of watershed : Delineation, Geomorphological Characteristics, linear aspects, aerial aspects and relief aspects, land use, runoff characteristics	8
3	Hydrological Process in Watershed : hydrological cycle, precipitation, interception, infiltration, evaporation, evapo-transpiration, surface runoff, ground water-flow, water budget, Ecological characteristics of the river	8
4	Soils in a Watershed: a) Soil characteristics- Physical, Hydrological b) Processes of soil erosion- Erosion due to water and wind, c) Measurement and estimation of soil erosion – Universal Soil Loss Equation	8
5	Land Capability Classification : Criteria, methods & Need- Criteria for classification, methods of classification, Need for land capability classification	8

Reference Books:

1. Watershed Planning and Management, 2nd Edition, Dr. Rajvir SIngh, Yash Publishing House, Bikaner, India.
2. Watershed Management, V. V. Dhruvanarayana, G. Sastry, U. S. Patnik.
3. Watershed Manual – A Guide for Watershed Development Practitioners and Trainers, B. K. Kakde, BAIF Development Research Foundation, Pune.
4. Soil and Watershed Conversation Engineering, 2nd Edition, R. Suresh – Standard Publication Distributors, Delhi.
5. Soil and Water Conservation Engineering, 4th Edition, G. O. Schwab, etc. John Wiley & Sons.
6. Integrated Watershed Management: A Field Manual for Equitable, Productive and Sustainable Development. Rajesh Rajora. Rawat Publicatios, Jaipur.

UNIVERSITY OF PUNE

T.Y., B.Sc.

Gg 332 : Geography of Travel & Tourism
(Semester III)

From June 2010

- Objectives:**
1. To acquaint the students with Concepts in tourism.
 2. To make the students aware of the tourism potential of the area.

Sr. No.	Topic	Sub-Topic	Learning Points	Periods
1.	Introduction Geographical Studies of Tourism	a. Definition b. Early Concepts c. Role of Geography in Tourism. d. Major components of Tourism.	(i) Tourism as a regional resource. (ii) Tourism as a multifaceted phenomena. (iii) Basic elements of tourism – dynamic, static, consequential elements. (i) Spatial patterns of supply. (ii) Spatial patterns of demand. (iii) The geography of resorts – seaside, resorts, winter & summer resorts. (iv) Tourist movements and flows. The impact of tourism.	10
2.	Tourism Resources	a. Locational factors b. Attractions	(i) Geographic location – Absolute and relative location. (ii) Major attractions – Natural features, manmade objects and man and culture. (iii) Seasonality – effect of seasonality, temperature, wind speed, precipitation, visibility. (iv) Accessibility – physical assets. (v) Accessibility - with reference to travel time, cost and distance. (vi) Market accessibility. (vii) Concept of intervening opportunities.	10
3.	Factors affecting Tourism	a. Physical Factors b. Historical and Cultural Factors	(i) Natural features – Geography, Topography, Soils, Slope, Stability (ii) Relief features – Mountains, Lakes, Coasts, Water Falls, Hot Springs, Volcanic Islands. (iii) Climate –Temperature & rainfall, Sunny Days, Snow Free Days. (iv) Vegetation – National Parks, Sanctuaries (examples from India) (i) Growth of Historical Places. (ii) National Culture and heritage preservation. (iv) Cultural Diversity – Language, Social Customs, Tribal Cultures.	10
4.	Tourists and Tourism	a. Basic of Classification	(i) Difference between Tourists and Tourism. (ii) Difference between Travel and Tourism.	10

			(iii) Tourism and Travel as basic needs of man. (iv) Nationality – International and Domestic.	
		b. Tourist Characteristics	(i) Socio-economic Characteristics. (ii) Visitor Density. (iii) Length of Stay. (iv) Types of Tourist activity. (v) Levels of Tourist Satisfaction.	
		c. Purpose of Travel	(i) Recreation, Culture, Health, Medical, Sports, Education and Business. (ii)	

Reference Books:

1. Pearce Douglas (1981) - "Tourist Development" – Longman, New York.
2. Arun Pratap Singh (1989) – "Himalayan Environment and Tourism" – Chugh Publications, Allahabad.
3. Nirmal Kumar (1996) – "Tourism and Economic Development" – APH Publishing Corporation, New Delhi.
4. L. E. Hudman and R. H. Jackson (1999) – "Geography of Travel and Tourism" – Delmar Publishers, New York.
5. J. K. Sharma (2000) – "Tourism Planning Development" – Kanishka Publishers, Distributors, New Delhi.
6. Yogesh Kumar Sharma and Praggya Sharma (2006) – "Handbook of Tourism" – Pointer Publishers, Jaipur.

UNIVERSITY OF PUNE

T.Y., B.Sc.

Gg – 333 Fundamentals of Geo-informatics - Paper I

(Semester III)

From June 2010

- Objectives:**
1. To acquaint the students with new concepts and approaches in Geography
 2. To familiarize the students with the wide application fields in Geography

Sr No	Topic	Sub topic	Learning points	Periods
1.	Introduction to Geoinformatics	Definition and History	Definition of Geoinformatics History of GIS Components of GIS Functions of GIS GIS tasks-Input, Manipulation, Management, Query analysis, Visualisation	10
2.	Sources and types of GIS data	Sources Types	Toposheet ,Surveying, Aerial photographs ,Satellite images Data types-Spatial and Non spatial	08
3.	GIS data structures	Data models	Raster data and their characteristics Vector data and their characteristics	08
4.	Data base management	Data analysis and modeling	Spatial measurements (measuring lengths and areas) Modeling surfaces (DEM and DTM)	08
5.	Remote sensing and GIS integration	RS and GIS applications	Applications in Urban, Agriculture, Land forms studies	06

Reference Books:

1. Kang-tsung Chang (2003) Geographic Information Systems, Tata Mc Graw Hill, New Delhi
2. Star J, and J. Estes, (1994), Geographic Information Systems: An Introduction, Prentice Hall, New Jersey.
3. Michael F. Goodchild and Karen K. Kemp (1990) Introduction to GIS, National Center for Geographic Information and Analysis, University of California, Santa Barbara.
4. Clarke, Keith C. (1999) Getting Started with Geographic Information Systems, Prentice Hall, New Jersey,
5. Lo Albert, C.P., and Young, K.W (2003) Concepts and Techniques of Geographical Information Systems, Prentice Hall of India Pvt. Ltd., New Delhi.
6. Williams J. (1995): *Geographic information from space*, John Wiley and Sons, England,
7. DeMers Michel N.(2000): Geographic Information Systems, John Wiley and Sons.

UNIVERSITY OF PUNE
T.Y., B.Sc.
Gg – 334: India – A Geographical Study
(Semester III)

From June 2010

- Objectives:**
1. To acquaint the students with Geography of our nation.
 2. To make the students aware of the magnitude of problems and prospectus at national level.
 3. To help the students to understand the inter relationship between the subject and the society.
 4. To help the students to understand the recent trends in regional studies.

Reference Books:

Sr No	Topic	Sub topic	Learning points	Periods
1.	Introduction	a. Geographical Location b. Position c. Geology of India	1. Geographical and relative location of India 2. Space relationship with neighboring countries 3. Major geological formations in India	08
2.	Physiography and Drainage	a. Main physiographic Regions b. Drainage Systems	1. The northern mountains 2. The north Indian plains 3. The peninsular plateau 4. The coastal lowlands and islands 1. East flowing rivers, Ganga, Brahmaputra, Godavari, Krishna. 2. West flowing rivers, Sindhu, Tapi, Narmada	08
3.	Climate	Summer, Winter, Monsoon	1. Various seasons and weather associated with these seasons. 2. Mechanism of Indian monsoon. 3. Major climatic regions of India. 4. Floods and droughts.	08
4.	Soils	Types	1. Major soil types and their distribution in India 2. Soil degradation and soil conservation. 3. Lateritic, Black cotton and red soil in India	08
5.	Forests	Types	1. Major forest types and their distribution in India. 2. Deforestation and conservation of forests 3. Importance of forest resources in national economy.	08

1. Agrawal A.N. - Indian economy, problems of development planning.
2. Chopra S.N. - India, An area study.
3. Dubey & Negi - Economic Geography of India.
4. Gosal singh - India.
5. Memoria C.B. - Geography of India.
6. Sharma R.C. - India.
7. Singh R.L. - Regional Geography of India.
8. Sharma & Cutinho - Economic and commercial Geography of India.

UNIVERSITY OF PUNE
T.Y., B.Sc.

Gg 335: Geography of Soils
(Semester III)

From June 2010

- Objectives:**
1. To acquaint the students with concepts in Soil Science.
 2. To familiarize the students with the importance of soil science in Geography

Sr. No.	Topic	Subtopic	Learning Points	Periods
1.	Introduction	Nature & Scope	Definition of Soil, Brief history of Soil Science/ Pedology, General ideas about formation of soils and soil profile, Importance of soil studies.	07
2.	Fundamentals of Soil Formation	Processes Mineral Composition	a) Weathering and Pedogenesis b) Genetic structure of soil profile. Primary minerals, clay minerals, behavior of clay minerals in tropics.	10
3.	Soil Physics	Basic Concepts	Soil texture and structure, Porosity and density, Soil moisture, Soil temperature, Soil color, Water holding capacity, Field capacity and wilting point.	07
4.	Soil Chemistry	Chemical Processes	Oxidation-Reduction, Ion exchange, Hydrogen ion concentration, Redox potential, Cation- Anion exchange.	08
5.	Soil Classification	Types	Basis of classification, zonal, intrazonal and azonal soils, Classification of Tropical soils.	08

Reference Books:

1. Bunting: Geography of Soils, Hutchinson, London
2. Rode A. A. : Soil science
3. Briggs David. : Soils, Butterworth, London
4. Birkland P. Weathering Pedology and Geo-morphological Research.

UNIVERSITY OF PUNE
T.Y., B.Sc.
Gg 336: Fundamentals of Geoinformatics – Paper II
(Semester III)
From June 2010

- Objectives:** 1. To acquaint the students with new concepts and approaches in Geography.
2. To familiarize the students with the wide application fields in Geography.

Sr. No.	Topic	Subtopic	Learning Points	Periods
1.	Introduction	History and Development	Historical development, Definition, A tool for resource surveys Applications.	06
2.	Electromagnetic energy	Electromagnetic Radiation Electromagnetic Spectrum	Electromagnetic Radiation: Definition Properties of electromagnetic waves: velocity, wavelength, frequency. Atmospheric interactions, scattering, reflection, emission, transmission. Division of spectrum in various spectral regions Imaging Systems: Normal color photos, IR color photos IR scanners	10
3.	Aerial Photography	Basic Concepts Geometry of Aerial Photographs	Aerial cameras, Types of photographs: vertical, oblique and terrestrial Aerial photographs as central perspective projection, Photo nadir, air base, flying height, Scales, swing and tilts	07
4.	Aerial Photographs	Types Annotation Strip, Stereoscopic View	Panchromatic(black and white), IR black & white, IR color photographs, Multispectral photographs. • Fiducial marks, Principal and conjugate principal point, Altimeter reading, level bubble, Run No., Sortie no, Task No. Depth perception, Pseudoscopic image, Forward overlap, Sidelap, stereograms, stereopairs, stereoscopes: Pocket & Mirror.	12
5.	Photo Interpretation		Visual and stereoscopic interpretation Method and elements of interpretation, interpretation keys	05

Reference Books :

1. Sabins Floyd(1987): Remote sensing: Principals and applications. Freeman and Company, London
2. Curran P.J.. (1995): Principals of Remote Sensing, John Wiley and Sons, England,
3. Lillesand T. & Kiefer R.W. (2000): Remote sensing and Image Interpretation. John Wiley and Sons.

UNIVERSITY OF PUNE

T.Y., B.Sc.

Gg 341: Principles and Techniques of Watershed Management – Paper II

(Semester IV)

From June 2010

- Objectives:**
1. To acquaint the students with concepts in watershed management.
 2. To familiarize the students with the importance of watershed management.

Sr. No.	Topics	Periods
1.	Resource Appraisal of a Watershed: Methods- Survey, Database Generation, Resource Mapping	8
2.	Introduction to Watershed Planning : Importance of Watershed planning, need of planning for small rain fed catchments, Importance of watershed planning in national development.	8
3.	Design and Plan for watershed Planning: Production oriented sustainability, food security, livelihood security, participatory planning, equity, capacity building, cost sharing, and restoration of landscape.	8
4.	Water and soil conservation measures: Water Conservation- Nala band, water harvesting techniques, storage of harvested water, traditional methods. soil conservation- contour bunding, gully plugging, trench cum mound, leveling, check dams	8
5.	Watershed Development Programmes: A forestation, plantation of grass and trees, Rural and integrated watershed development plan, Watershed based farming system, crop-production, dryland farming, livestock production, energy plants.	8

Reference Books:

1. Watershed Planning and Management, 2nd Edition, Dr. Rajvir SIngh, Yash Publishing House, Bikaner, India.
2. Watershed Management, V. V. Dhruvanarayana, G. Sastry, U. S. Patnik.
3. Watershed Manual – A Guid for Watershed Development Practitioners and Trainers, B. K. Kakde, BAIF Development Research Foundation, Pune.
4. Soil and Watershed Conversation Engineering, 2nd Edition, R. Suresh – Standard Publication Distributors, Delhi.
5. Soil and Water Conservation Engineering, 4th Edition, G. O. Schwab, etc. John Wiley & Sons.
6. Integrated Watershed Management: A Field Manual for Equitable, Productive and Sustainable Development. Rajesh Rajora. Rawat Publicatios, Jaipur.

UNIVERSITY OF PUNE

T.Y., B.Sc.
Gg 342: Geography of Travel & Tourism
 (Semester IV)
 From June 2010

- Objectives:**
1. To acquaint the students with Concepts in tourism.
 2. To make the students aware of the tourism potential of the area.

Sr. No.	Topic	Sub-Topic	Learning Points	Periods
1.	Types of Tourism	a. Classification b. Forms	(i) Historical and Cultural Tourism, Religious Tourism. (ii) Rural Tourism – Agro-tourism, Farm-tourism (iii) Concept of Second Homes. (iv) Geo-tourism. (v) Eco-tourism. (i) Caravan Tourism, Camping. (ii) Water Transport Tourism – Boating, Cruise, Ship Travel, Rivers, Canals, Yachting (iii) Sports Tourism. (iv) Adventure Tourism.	10
2.	Tourism and Economic Activity	a. Role of Tourism in National Economy. b. Role of Transportation c. Role of Accommodation	(i) Employment Generation (ii) Foreign Exchange Earnings. (iii) Balance of Payments. (iv) Range of Services in Tourism Sector. (v) Regional Development – Sustainable Tourism Development. (i) Modes of Transport used by Tourists – Air, Rail, Road and Waterways. (ii) Factors influencing Choice of Transport. (iii) Transportation Costs. (iv) Incentives offered – Tour Packages. (i) Need for the different types of accommodations – Hotels, Dormitories, Youth Hostels, Cottages, Homes, Tents, House Boats, Yatri Bhavans, Dharamshalas	10
3.	Impact of Tourism.	a. Economic Impact of Tourism. b. Environmental Impact of Tourism.	(i) Three types of expenditures – Direct, Indirect, and Induced. (ii) Types – a. Sales or Transaction Multipliers. b. Output Multipliers. c. Employment Multipliers. d. Income Multipliers. (iii) Methods of Deriving Tourism Multipliers. (iv) Increase in Land Values, Government Revenues and Trading Activity. (i) Impacts of Recreation on Wildlife. (ii) Pollution Emissions.	10

		c. Social and Cultural Impacts of Tourism.	(iii) Trampling of Vegetation and Soils. (iv) Destruction of Species. (i) Tourism and Cultural Change. (ii) Impacts on Religion, Language and Health. (iii) Impact on Local People Lifestyle. (iv) Deterioration of Traditional Arts (v) Effects of Foreign Elements on Indigenous Culture.	
4.	Case Studies	a. Hill Stations b. Beach Resorts c. Temples and Caves d. Historical Places e. National Parks	(i) Darjeeling, Nainital. (ii) Ooty. (i) Kerala and Goa (i) Ajanta, Ellora, Hampi. (i) Agra, Bodhgaya. (i) Jim Corbett National Park, Kaziranga, Melghat.	10

Reference Books:

1. Pearce Douglas (1981) - "Tourist Development" – Longman, New York.
2. Arun Pratap Singh (1989) – "Himalayan Environment and Tourism" – Chugh Publications, Allahabad.
3. Nirmal Kumar (1996) – "Tourism and Economic Development" – APH Publishing Corporation, New Delhi.
4. L. E. Hudman and R. H. Jackson (1999) – "Geography of Travel and Tourism" – Delmar Publishers, New York.
5. J. K. Sharma (2000) – "Tourism Planning Development" – Kanishka Publishers, Distributors, New Delhi.
6. Yogesh Kumar Sharma and Praggya Sharma (2006) – "Handbook of Tourism" – Pointer Publishers, Jaipur.

UNIVERSITY OF PUNE
T.Y., B.Sc.
Gg 343: Fundamental of Geoinformatics – Paper II
(Semester IV)

From June 2010

- Objectives:**
1. To acquaint the students with new concepts and approaches in Geography
 2. To familiarize the students with the wide application fields in Geography

Sr. No.	Topic	Subtopic	Learning Points	Periods
1.	Digital Images	Properties and Types	RGB format, BIP, BIL, BSQ formats, Pixels	08
2.	Image Processing	a. Techniques b. Classification	Registration, Georeferencing. Enhancement: Filtering, Band Ratioing Supervised, Unsupervised Classification	08
3.	Analysis in GIS	Major types of analysis	Spatial analysis, Multicriteria analysis, Overlay analysis, Topographic analysis.	08
4.	Query in GIS	Major types of queries	Spatial, Non spatial, Spatio temporal	08
5.	Project in GIS	Report Writing	Types of Reports, Design in GIS, Utility	08

NOTE: Demonstrations of the above techniques on COMPUTERS in the Departments or elsewhere are recommended

Reference Books:

1. Goodchild M.F (1993): Environmental Modeling with GIS ,l Oxford University Press, London
2. Williams J. (1995): *Geographic information from space*, John Wiley and Sons, England,
3. DeMers Michel N. (2000): Geographic Information Systems, John Wiley and Sons
4. Chang Kang-tsung (2002): Introduction to Geographic Information Systems, Tata McGraw Hill, New Delhi

UNIVERSITY OF PUNE
T.Y. B.Sc.
Gg – 344: India – A Geographical Study
(Semester IV)

From June 2010

- Objectives:**
1. To acquaint the students with Geography of our nation.
 2. To make the students aware of the magnitude of problems and prospectus at national level.
 3. To help the students to understand the inter relationship between the subject and the society.
 4. To help the students to understand the recent trends in regional studies.

Reference Books :

Sr No	Topic	Sub topic	Learning points	Periods
1.	Minerals and Energy Resources	Distribution and Utilization	1. Iron ore, manganese and bauxite. 2. Coal, petroleum, natural gas 3. Hydro, thermal, atomic power projects. Energy crisis.	08
2.	Agriculture	a. Infrastructural factors b. Institutional factors c. Development	Irrigation, Seeds, Fertilizers, Power & Finance 1. Land holding, land tenure, land reforms. 2. Agricultural productivity and intensity. 1. Green revolution, its socio economic & ecological importance 2. Significance of dry farming 3. White revolution and blue revolution. 4. Agricultural regionalization.	10
3.	Industry	Major industries and Development	1. Locational factors, development and distribution of textile, iron and steel, fertilizer, chemical, automobile and sugar industries. 2. Industrial complexes and industrial regionalization, new industrial policy. 3. Multinationals and liberalization.	10
4.	Population	Growth & Distribution	1. Growth & distribution of population. 2. Composition of population. 3. Rural - urban migration. 4. Urbanization and related problems.	04
5.	Transport, Communication and Trade	Transportation Network	1. Network of roads, railways, waterways, airways and pipelines. Their complementary role in regional development. 2. Growing importance of ports in national and foreign trade. Trade balance. 3. Developments in communication technology. Its impact on economy and society.	08

9. Agrawal A.N. - Indian economy, problems of development planning.
10. Chopra S.N. - India, An area study.
11. Dubey & Negi - Economic Geography of India.
12. Gosal singh - India.
13. Memoria C.B. - Geography of India.
14. Sharma R.C. - India.
7. Singh R.L. - Regional Geography of India.
8. Sharma & Cutinho - Economic and commercial Geography of India.

UNIVERSITY OF PUNE
T.Y., B.Sc.

Gg 345: Geography of Soils
(Semester IV)

From June 2010

- Objectives:** 1. To acquaint the students with concepts in Soil Science.
2. To familiarize the students with the importance of soil science in Geography.

Sr. No.	Topic	Subtopic	Learning Points	Periods
1.	Soil Forming Processes	Factors Processes	Natural factors: Living organisms, parent rocks, relief, climate and vegetation. Stalinization, Lateratization, Podzolization.	12
2.	Soil Biochemistry	Basic Ideas	Organic matter: Formation of Humus Biochemical compounds	10
3.	Tropical Soils	Types	Soils in humid climate, Laterites	8
4.	Soil as a Resource	Problems, Management	Soil degradation: deforestation, overgrazing, Methods of soil management.	10

Reference Books:

5. Bunting: Geography of Soils, Hutchinson, London
6. Rode A. A. : Soil science
7. Briggs David. : Soils, Butterworth, London
8. Birkland P. Weathering Pedology and Geo-morphological Research.

UNIVERSITY OF PUNE
T.Y., B.Sc.
Gg 346: Fundamentals of Geoinformatics – Paper II
(Semester IV)

From June 2010

- Objectives:**
1. To acquaint the students with new concepts and approaches in Geography
 2. To familiarize the students with the wide application fields in Geography.

Sr. No.	Topic	Subtopic	Learning Points	Periods
1.	Satellite Imaging	A) Types of Satellites B) Sensors	Geostationary and Sun Synchronous, ERTS, LANDSAT, SPOT, INSAT, IRS & IKONOS Satellite platforms, Optical mechanical scanners, Infrared scanners, types of resolution.	10
2.	Satellite Images	Types	Multispectral images, Thermal infrared images, Radar images.	08
3.	INSAT & IRS	Types	INSAT series, IRS series, Resolution and other properties.	08
4.	Image Interpretation		Annotation strip, Method and elements of interpretation, interpretation keys. Ideas about digital image processing.	08
5.	Applications	Aerial Photos and Satellite Images	Applications in resource and environmental studies	06

Reference Books:

1. Sabins Floyd (1987): Remote sensing: Principals and applications. Freeman and Company, London
2. Curran P. J. (1995): Principals of Remote Sensing, John Wiley and Sons, England,
3. Lillesand T. & Kiefer R.W. (2000): Remote sensing and Image Interpretation. John Wiley and Sons.

UNIVERSITY OF PUNE
T.Y., B.Sc.
Gg – 347 : Map Analysis and Field Work

From June 2010

- Objectives:** 1. To acquaint the students with techniques of toposheet interpretation in Geography
 2. To familiarize the students with field techniques and data collection in Geography

Section I: Study and Interpretation of SOI toposheets.

Sr No	Topic	Sub topic	Learning points	Periods
1.	SOI Toposheets	a. Representation of relief, slope and contour features	1) Qualitative and quantitative methods of relief representation: Hachures, hill shading, color tints, Spot heights, bench marks, Trig points, Contours, Form lines 2) Methods of slope expression by contours: Even, uneven, concave, convex, gentle, steep and terraced 3) Representation of features by contours: Conical hill, plateau, ridge, spur, escarpment and waterfall, overhang, river valley, pass, saddle	5
		b. Introduction to Toposheet	1) Index to SOI sheets, , extent, contour interval on 1:1,000,000, 1:250,000, 1:50,000, 1:25,000 SOI sheets and their corresponding scales in British and Metric systems 2) Marginal information 3) Grid reference - international and six figure 4) Description and drawing of conventional signs and symbols.	5
		c. Profile drawing to assist Interpretation	1) Drawing and description of regional cross profile with a mention of vertical exaggeration. 2) Determination of intervisibility from the cross profiles. 3) Drawing and description of longitudinal profile of a river.	6
2.	Study of fluvial landscape	Features of river work.	Identification and interpretation of features of river erosion and deposition in upstream, and downstream sectors (Such as Gorge, V shaped valley, Waterfalls, knick points, meanders, oxbow lakes, terraces, flood plains, deltas etc.) for two toposheets on 1:50,000 or one inch scale.	8
3.	Study of Coastal landscape	Features on the coast	Identification and interpretation of features of coastal erosion and deposition by sea waves (Such as Beaches and dunes, Bars, Spits, Cliffs, Shore platforms, shoreline terraces, Creeks, Estuaries, Swamps etc.) for two toposheets on 1:50,000 or one inch scale.	8
4.	Study of settlements	Characteristics of Settlements	Study and interpretation of settlements with reference to site and situation, types, functions, facilities, connectivity etc for two toposheets on 1:50,000 or one inch scale.	8

Section II : Project work and field excursion

Sr No	Topic	Sub topic	Learning points	Periods
5.	Project work		Preparation of a set of maps and the description of each map showing relief, soils, vegetation, Climate, settlements and landuse in a taluka from Maharashtra. Or Study of a tribe or an industry or a small town or a village.	30
6.	Field excursion		One short tour of two days duration and preparation of tour report Or One long tour of more than five days duration and preparation of tour report	10

Note:

1. Use of map stencils, log tables, statistical tables and calculators is allowed at the time of examination.
2. Journal completion by the student and the certificate of completion by the practical in charge and the Head of the department is compulsory.
3. Candidate without a certified journal should not be allowed for the practical examination.

Reference Books:

1. Singh G. 1996, Map work and practical geography, Vikas publ. New Delhi
2. Singh R.L., 1979, Elements of practical Geography, Kalyani publ., New Delhi

UNIVERSITY OF PUNE
T.Y., B.Sc.
Gg – 348: Techniques of Spatial Analysis

From June 2010

- Objectives:**
1. To acquaint the students with various techniques in cartography.
 2. To familiarize the students with the methods of statistical analysis.

Section I: Cartographic techniques

Sr No	Topic	Sub topic	Learning points	Periods
1.	Introduction	Reference systems	1) Co ordinate systems, Geographical co ordinates. 2) Grid systems, grid north, magnetic north and true north. 3) Bearing- magnetic and true	10 G B
2.	Scales	Meaning and types	1) Meaning ,definition and types of map scales 2) Methods of scale representation- verbal, graphical and numerical, representative fraction. 3) Conversion of scales.	10
3.	Cartographic Interpretation	Signs and symbols	1) Signs and symbols used in quantitative, cartographic data representation, their merits and demerits 2) Point, line and area symbols 3) Proportional symbols	10
4.	Drawing of maps	Quantitative maps	Isopleth, choropleth maps, dot maps, flow diagram. (One map each)	10

Section II: Project work and field excursion

Sr No	Topic	Sub topic	Learning points	Periods
5.	Statistical data	Frequency distribution	1) Tally marks and frequency table 2) Frequency histogram, polygon and curve 3) Cumulative frequency and Ogive curves	10
6.	Statistical methods	a. Measures of Central Tendencies	1) Meaning and description of central tendencies namely mean, mode and median 2) Calculation of mean, mode and median for ungrouped and grouped data (2 examples each)	6
		b. Measures of Dispersion	Mean deviation mean absolute deviation, variance, standard deviation and coefficient of variation.	6
		c. Population and samples	i. Definition of population and sample., Meaning of unbiased random sample. ii. Methods of sampling: Random, Systematic and stratified.	6
		d. Testing of hypothesis	Meaning and definition of: a. Null and alternative hypothesis . Level of significance (Rejection level) . Degrees of freedom . Parametric and non parametric tests	6

		e. Correlation and regression	Application of following tests: . Chi squared test (one way only) . Student's t test (comparison of sample means) a. Concept of bivariate correlation and regression. b. Meaning of coefficient of correlation. c. Calculation of Pearson's product moment correlation coefficient (two examples) d. Spearman's rank order correlation coefficient. (two examples). e. Calculation, plotting and interpretation of simple regression equation (two examples).	6
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Note:

1. Use of map stencils, log tables, statistical tables and calculators is allowed at the time of examination.
2. Journal completion by the student and the certificate of completion by the practical in charge and the Head of the department is compulsory.
3. Candidate without a certified journal should not be allowed for the practical examination.

Reference Books:

1. Ebdon David, 1989, Statistics for Geographers
2. King, 1975, Statistical Geography
3. Singh G. 1996, Map work and practical geography, Vikas publ. New Delhi
4. Singh R.L., 1979, Elements of practical Geography, Kalyani publ., New Delhi

UNIVERSITY OF PUNE
T.Y., B.Sc.
Gg – 349: Techniques of Geomorphology

From June 2010

- Objectives:**
1. To acquaint the students with various techniques in geomorphic analysis.
 2. To familiarize the students with the basic methods of soil analysis.

Section I: Practicals in Geomorphology

Sr No	Topic	Sub topic	Learning points	Periods
1.	Relief analysis	Methods of analysis	<ol style="list-style-type: none"> 1) Drawing and description of a regional cross profile with a mention of vertical exaggeration. 2) Drawing and description of longitudinal profile of a river. 3) Construction of superimposed, projected and composite profiles 4) Map showing relative relief by Smith's method. 5) Slope map by Wentworth's method. 	20
2.	Drainage basin analysis	Demarcation and calculation of drainage network parameters	<ol style="list-style-type: none"> 1. Demarcation of drainage basin and calculation of drainage area by graphical method. 2. Determination of stream orders by Strahler's method. 3. Demarcation of lower order drainage basins and calculation of drainage area by graphical method. 	10
3.	Drainage network analysis	Calculation of aspects of drainage network	<ol style="list-style-type: none"> i. Counting of stream numbers of each order. ii. Measurement of stream lengths and calculation of basin areas of each order. iii. Calculation of drainage density, stream frequency and bifurcation ratio. iv. Stream order and number relationship (Calculation and plotting). v. Stream order and length relationship (Calculation and plotting). vi. Stream order and area relationship (Calculation and plotting). 	10

Section II: Soil Analysis

Sr No	Topic	Sub topic	Learning points	Periods
4.	Concept of soil sampling	Methods	Various methods of soil sampling and at least one field sampling (by hand sampling and using soil augur)	05
5.	Study of physical properties of soils	Laboratory determination	Determination of <ol style="list-style-type: none"> i. Soil texture properties of soils determination ii. Bulk density iii. Specific gravity and porosity iv. Soil p^h v. Soluble salts 	15
6.	Study of chemical properties of	Laboratory determination	Determination of <ol style="list-style-type: none"> i. CaCO₃ ii. Fe₂ O₃ 	20

	soils		iii. Al_2O_3 iv. SiO_2 v. Organic matter vi. N,P,K	
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1. Use of map stencils, log tables, statistical tables and calculators is allowed at the time of examination.
2. Journal completion by the student and the certificate of completion by the practical in charge and the Head of the department is compulsory.
3. Candidate without a certified journal should not be allowed for the practical examination.

Reference Books :

1. Miller Austin, 1979, Skin of the earth
2. Wilkinson & Monkhouse 1975, Maps & Diagrams
3. King 1994, Techniques in geomorphology
4. Briggs, 1979, Soils
5. Piper, 1975, Soil chemical analysis