

Department of General and Applied Geography

School of Applied Sciences



Curriculum Framework

B.A. / B.A.- B.Ed. / B.Sc.

Based on National Education Policy- 2020

Date of BoS: June 24, 2024

Doctor Harisingh Gour Vishwavidyalaya

(A Central University)

Sagar-470003, Madhya Pradesh

About the Department

The Department of General and Applied Geography is one of the pioneer departments in the country, established in 1953 with Prof. Mackim as its first Head. The department has a glorious history of sharing their domain knowledge and research at national and international academic platforms. The department has produced research of international repute, published in international journals such as Nature, Science and publishers viz. Elsevier, Springer, Taylor and Francis, etc. The department offers Ph.D., M.Sc./M.A. and B.Sc./B.A. programs in Geography. The department is currently supported by DST (GOI) under FIST Level-I program. The department has a Remote Sensing and GIS Lab and all advanced surveying instruments. The faculty of the department is committed to train the students to develop their skills in geoinformatics, surveying, statistical analyses and landscape interpretation. These skills are integral to the course and help the students in their research pursuits. Presently, the department has six meritorious, experienced and devoted faculties. The department has been pioneer in the teaching of Astronomy, Cartography and Applied Geography since its inception. The department has been attracting students from all over the country and has produced several academicians, scientists, administrative officers. Population Research Centre (PRC), Ministry of Health and Family Welfare, Govt. of India, New Delhi is an integral part of the department since 1999.

Curriculum Framework based on National Education Policy-2020

NEP-2020 has conceptualized the idea to develop well rounded competent individuals for making the nation a self-reliant and global leader. In the same spirit, we at **Department of General and Applied Geography** have developed a curriculum framework to encompass the goals of NEP 2020. To this end, we have incorporated choice of subject/disciplines of study, creating academic pathways having constructive combinations of disciplines for study with multiple entry and exit points as well as focus on **experiential learning** for students by introducing **multidisciplinary and skill enhancement courses** and actual Hand's on training in the recent and trending aspects of the area concern.

Under Graduate Curriculum Framework for Bachelor of Arts & Bachelor of Science

1. Name of the Programme: B. Sc., B. A. & B. A. B. Ed.

2. About the Programme:

The Bachelor of Science (B.Sc.), Bachelor of Arts (B.A.) and Bachelor of Education (B.A.-B.Ed.) in Geography programs offer students a holistic understanding of Geography. The purpose of the undergraduate geography program at Department of General and Applied Geography is to provide the fundamental knowledge of the major fields of geography to the students covering the general areas of physical and human geography along with the skills and abilities of fundamental cartographic practices, digital technologies and surveying so as the students may be specialised and skilled to undertake the various careers in government and private sectors. Moreover, the student will be trained in applied laboratory techniques, critical thinking, independent and team learning, and are provided with research opportunities. The faculty is committed to providing an apt academic milieu to address the individual needs of each student and encourage them to develop their potential.

3. Objectives of the Programme:

After Completion of the programme the student will learn:

- Understand and apply the fundamental principles, concepts and methods of Geographical Studies.
- Demonstrate the problem solving, analytical and logical skills in understanding physical and cultural landscapes.
- Apprise the techniques of surveying in spatial analysis and measurements.
- Understand the importance of geo-informatics in understanding the land use and land cover mapping.
- Enhance the learning of judicious use of GI technology for the sustainable growth of mankind in synergy with nature.
- Understand the professional, ethical and social responsibilities in the creation and use of geographical knowledge.
- Enhance the research culture and uphold the scientific integrity and objectivity.
- Express proficiency in oral and written communications to appreciate geographical knowledge.
- Develop industry focused skills and learning to lead a successful career.

4. **Programme Learning Outcomes:**

After the completion of the programme, students will be able to:

- **Disciplinary knowledge:** Demonstrate and understand basic concepts, and fundamental principles of geography.
- **Communication skills:** Effectively express their geographical understanding through means reports and presentations.
- **Critical thinking:** Collect and analyse the various scientific problems and draw a conclusion to design apt solutions.
- **Problem solving:** observe and simulate the geographical problems in day-to-day life.
- **Analytical reasoning:** Analyse and interpret data with appropriate methods and techniques in the domain.
- **Cooperation/Teamwork:** deliver and facilitate cooperative effort as a group in the field and lab experiment, assignments and group activities etc.
- **Information/digital literacy:** Access, evaluate, and use of relevant data sources in a systematic manner through appropriate software and web-based platforms.
- **Self-directed learning:** Engage in independent and self-directed learning to get in-depth knowledge through e-learning resources and MOOC courses.
- **Scientific reasoning:** Acquire reasoning and problem-solving skills to analyse, interpret and draw conclusions from quantitative and qualitative data.
- **Moral and ethical awareness/reasoning:** Embrace and practice research ethics adopted in geographical studies.
- **Leadership readiness/qualities:** Formulate an inspiring vision and motivate the team for the collective efforts in an efficient way.
- **Lifelong learning:** Develop knowledge and skills for personal and institutional development by adapting the industrial and work demands through skill development.

5. Structure of the Programme

Curriculum Framework Syllabus: B A/ B.Sc. Geography

L-5 (I & II Semester)

Level: 5 Semester I							
Nature of Course	Course Code	Course Title	MM	L	T	P	C
Discipline Specific Major	GOG-DSM-111	Physical Geography:Lithosphere	100	4	0	0	4
Discipline Specific Major	GOG-DSM-112	Map Reading and Interpretation (Practical)	100	0	0	2	2
Discipline Specific Major	DSM-113	Other Department	100	6	0	0	6
Ability Enhancement Course (Either I or II Sem)	GOG-AEC-111	Chain & Tape Surveying	100	2	0	0	2
Skill Enhancement Course (SEC) (Either I or II Sem)	GOG-SEC-111	Introduction to Cartography	100	2	0	0	2
Value Enhancement Course	VEC - 111	Other Department	Qualifying				
Total Credits							20

Note: Student can opt either AEC or SEC in one Semester

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Multi-Disciplinary Major	GOG-MDM-111	Physical Landscapes of India	100	6	0	0	6

Level: 5 Semester II							
Nature of Course	Course Code	Course Title	MM	L	T	P	C
Discipline Specific Major	GOG-DSM-211	Human Geography	100	4	0	0	4
Discipline Specific Major	GOG-DSM-212	Relief Analysis and Surveying (Practical)	100	0	0	2	2
Discipline Specific Major	DSM-213	Other Department	100	6	0	0	6
Ability Enhancement Course (Either I or II Sem)	GOG-AEC-211	Prismatic Compass Survey	100	2	0	0	2
Skill Enhancement Course (SEC) (Either I or II Sem)	GOG-SEC-211	Introduction to Statistical Methods in Geography	100	2	0	0	2
Value Enhancement Course	VEC - 211	Other Department	Qualifying				
Total Credits							20
Exit with Certificate							

Note: Student can opt either AEC or SEC in one Semester

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Multi-Disciplinary Major	GOG-MDM-211	Resource Geography of India	100	6	0	0	6

L-6 (III & IV Semester)

Level: 6 Semester III							
Nature of Course	Course Code	Course Title	MM	L	T	P	C
Discipline Specific Major	GOG-DSM-311	Economic Geography	100	4	0	0	4
Discipline Specific Major	GOG-DSM-312	Representation of Data and Surveying (Practical)	100	0	0	2	2
Discipline Specific Major	DSM-313	Other Department	100	6	0	0	6
Ability Enhancement Course (Either I or II Sem)	GOG-AEC-311	Plane Table Surveying	100	2	0	0	2
Skill Enhancement Course (SEC) (Either I or II Sem)	GOG-SEC-311	Introduction to Regional Planning & Development	100	2	0	0	2
Value Enhancement Course	VEC - 311	Other Department	Qualifying				
Total Credits							20

Note: Student can opt either AEC or SEC in one Semester

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Multi-Disciplinary Major	GOG-MDM-311	Indian Monsoon Mechanism	100	6	0	0	6

Level: 6 Semester IV							
Nature of Course	Course Code	Course Title	MM	L	T	P	C
Discipline Specific Major	GOG-DSM-411	Physical Geography: Climatology and Oceanography	100	4	0	0	4
Discipline Specific Major	GOG-DSM-412	Weather Interpretation & Forecasting (Practical)	100	0	0	2	2
Discipline Specific Major	DSM-413	Other Department	100	6	0	0	6
Ability Enhancement Course (Either I or II Sem)	GOG-AEC-411	Indian Clinometer	100	2	0	0	2
Skill Enhancement Course (SEC) (Either I or II Sem)	GOG-SEC-411	Introduction to Remote Sensing	100	2	0	0	2
Value Enhancement Course	VEC - 411	Other Department	Qualifying				
Total Credits							22
Exit with Diploma							

Note: Student can opt either AEC or SEC in one Semester

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Multi-Disciplinary Major	GOG-MDM-411	Population Geography of India	100	6	0	0	6

L-7 (V & VI Semester)

Level: 7 Semester V

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Discipline Specific Major	GOG-DSM-511	Environment and Resources	100	4	0	0	4
Discipline Specific Major	GOG-DSM-512	Map Projection and Surveying (Practical)	100	0	0	2	2
Discipline Specific Major	DSM-513	Other Department	100	6	0	0	6
Ability Enhancement Course (Either I or II Sem)	GOG-AEC-511	Disaster Risk Reduction	100	2	0	0	2
Skill Enhancement Course (SEC) (Either I or II Sem)	GOG-SEC-511	Introduction to GIS & GPS	100	2	0	0	2
Value Enhancement Course	VEC - 511	Other Department	Qualifying				
Total Credits							20

Note: Student can opt either AEC or SEC in one Semester

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Multi-Disciplinary Major	GOG-MDM-511	Geography of Tourism	100	6	0	0	6

Level: 7 Semester VI

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Discipline Specific Major	GOG-DSM-611	Geography of India	100	4	0	0	4
Discipline Specific Major	GOG-DSM-612	Quantitative Techniques in Geography (Practical)	100	0	0	2	2
Discipline Specific Major	DSM-613	Other Department	100	6	0	0	6
Ability Enhancement Course (Either I or II Sem)	GOG-AEC-611	Sustainability and Development	100	2	0	0	2
Skill Enhancement Course (SEC) (Either I or II Sem)	GOG-SEC-611	Field Techniques and Survey	100	2	0	0	2
Value Enhancement Course	VEC - 611	Other Department	Qualifying				
Total Credits							22
Exit with Degree							

Note: Student can opt either AEC or SEC in one Semester

Nature of Course	Course Code	Course Title	MM	L	T	P	C
Multi-Disciplinary Major	GOG-MDM-611	Disaster Management	100	6	0	0	6

6. Exit: Certificate in

7. Teaching Learning Approach:

Mainly this programme will transact the under given pedagogic approach-

- a. Lecture/ Seminar format: Chalk and board, PPT presentation, Field work
- b. Demonstration: Demonstration of Maps, Models and Geo-informatic data sets
- c. Readings/written assignments and Field Projects: Written Assignment, Seminars and Field Projects
- d. Group discussions/tutorial: Group discussions & tutorials in field projects and dissertations
- e. Project work: Project work and Assignments
- f. Field Visit/Survey/Dissertation: Geography being a spatial science field visits and surveys are integral part of geographical studies.

8. Assessment

The learner in the programme will be assessed throughout the duration of the programme in a formative and summative evaluations i.e. Mid (I & II) and End Semester examinations. To be eligible to appear in End semester examination a student must appear in Mid semester examinations along with 75 per cent attendance in classroom processes.

Level 5
First Semester

GOG DSM- 111- Physical Geography: Lithosphere

Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L5 Sem I	GOG-DSM-111	Physical Geography: Lithosphere	L 60	T 0	P 0	C 4	IA (Mid)-40 EA (End Sem)-60	Dr. Satheesh C. Dr. Rakesh Saini Dr. Parvendra Kumar

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the evolution, structure and configuration landforms and land forming process.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

- i. Understand the components of the earth system – atmosphere, lithosphere and hydrosphere;
- ii. Appreciate and understand various features of the spheres with local, regional and global examples;
- iii. Understand the Earth Movements and development of landforms.

3. Unit wise Learning Outcomes:

UO 1. Know about the different theories of origin of the Earth.

UO 2. Learn about the evolution of first and second order landforms.

UO 3. Understand the major endogenetic processes of landscape evolution.

UO 4. Understand the major exogenetic processes of landscape evolution.

UO 5. Learn about the landform evolution in different environments.

Unit	Content	Lecture/Period
Unit I	Origin of the Earth - Hypotheses and theories: Nebular, Tidal and Big Bang Theory - The constitution of the earth's interior - Age of the earth - Geological time scale	12
Unit II	Landform Evolution - First order land forms: Continents and Oceans: Wegner's theory; Plate tectonics - Second order land forms: Mountains, Plateau, plains: their classification and distribution; - Earth's Materials: Rocks- their origin, classification and characteristics	12
Unit III	Endogenetic Processes - Epeirogenetic and Orogenetic - Folds and Faults; - Seismic activities: causes and distribution - Earthquakes- Classification and world distribution; - Volcanic activity: causes, types, distribution and resultant landforms	12
Unit IV	Exogenetic Processes: - Denudational agents - Weathering Process: Physical, Chemical and Biological; - Mass wasting and resultant landforms	12
Unit V	Agents of Landforms Development: - Work of running water- erosional and depositional landforms. - Aeolian Landforms: erosional and depositional land forms; - Glacial landforms: erosional and depositional land forms	12

Essential Readings

1. Strahler, A.N. and Stahler, A.M. Modern Physical Geography. Wiley India, New Delhi, 2016.
2. Singh, S. Physical Geography. Pravalika Publications, Allahabad, 2016.
3. Bryant Richard, H. Physical Geography. Rupa Publication. New Delhi, 2016.
4. fllag lfoUn Hkksfrd Hkxksy] izokfydk izdk'ku] xksj[kiqj] 2017
5. fllag lfoUn Hkw&vkd`fr foKku] ol/kjk] xksj[kiqj] 2017

Suggested Readings

1. Hugget, R. J. Fundamentals of Geomorphology, Routledge Taylor & Francis, London, 2017.
2. Bloom A. L. Geomorphology. Rawat Pulication, Jaipur, 2012.
3. Robinson, P.J. & S. Henderson. Contemporary Climatology. Henlow, 1999.
4. Singh, S. Geomorphology. Prayag Publications, Allahabad, 1998.
5. Stoddart, D. R. Process and Form in Geomorphology (Edited). Routledge, New York, 1996.
6. Garner, H.F. The Origin of Landscape- A Synthesis of Geomorphology. O. U.P. London, 1974.
7. Chorley, R.J. Spatial Analysis in Geomorphology. Methuen, London. 1972.
8. Sparks, B.W. Geomorphology. Longman, London, 1960.
9. Thornbury, W. D. Principles of Geomorphology. John Wiley, New York, 1960.
10. Wooldridge, S.W. and Morgan, R. S. The Physical Basis of Geography- An Outline of Geomorphology. Longman, London, 1959.
11. dkSf'kd] ,l- Mh- Hkw&vkd`fr foKku] jLrksxh] esjB] 2012

GOG DSM- 112- Map Reading and Interpretation (Practical)

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L5 Sem I	GOG-DSM-112	Map Reading and Interpretation (Practical)	L	T	P	C	IA (Mid)-40 EA (EndSem)- 60	Dr. Satheesh C. Dr. Rakesh Saini Dr. R. B. Anuragi
			0	0	30	2		

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the basics of map science, basic reading and interpretational skills.

2. Course Learning Outcomes: After the completion of course, the students will have ability to:

1. Understand the Nature and Development of Cartography
2. Able to prepare maps with their basic elements.
3. Identification of different rocks structures with their basic properties.

3. Unit wise Learning Outcomes:

UO 1. Learn and appreciate the basics of cartography and their major application areas.

UO 2. Learn the different types of scales.

UO 3. Learn the methods of construction of scale.

UO 4. Understand the types of maps and techniques of map enlargement and reduction.

UO 5. Recognise the various types and characteristics of rocks

Unit	Content	Lecture/Period
Unit I	Introduction to Cartography • The nature and scope of cartography • Development of cartography • elements of cartography • Application of cartography	12
Unit II	Scale: Basic Concepts • Statement scale, • Representative Fraction (R.F.) • Graphical scale	12
Unit III	Construction of Scales • Graphical /Linear Scale • Simple & Comparative Scale • Diagonal and Time Scale • Conversion and Uses of Scale	12
Unit IV	Maps: Concept and Types • Enlargement and reduction of Maps • Graphical method: Square Method • Similar Triangle Method	12
Unit V	Identification of different rocks • Igneous rocks • Sedimentary rocks • Metamorphic rocks	12

Essential Readings

1. Singh L. R. *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad, 2016.
2. Singh, R.L. *Elements of Practical Geography*. Kalyani, New Delhi. 1991.
3. Sarkar, A. *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi, 2015. ts-ih- % Singh Gopal. *Map Work and Practical Geography*. Vikas Publishing, New Delhi. 2012
4. प्रायोगिक भूगोल, रस्तोगी, मेरठ, 2016.
5. मिश्रा आर. एन. एवं शर्मा पी. के. प्रायोगिक भूगोल, रावत पब्लिकेशन जयपुर 2019

Suggested Readings

1. Robinson, A.H, et. al. *Elements of Cartography*. 6th ed. John Wiley, New York, 1995.
2. Misra, R.P. & A. Ramesh : *Fundamentals of Cartography*. Concept, New Delhi. 1989.
3. Monkhouse, F.J. *Maps and Diagrammes*. Methuen, London. 1982.
4. Raisz, E. *General Cartography*. John Wiley and Sons, New York. 5th edition, 1962.
5. सिंह, आर. एल. : प्रायोगिक भूगोल का मूलतत्त्व, कल्याणी, नई दिल्ली 2015

GOG-MDM-111- Physical Landscapes of India

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L5 Sem I	GOG- MDM-111	Physical Landscapes of India	L 90	T 0	P 0	C 6	IA (Mid)-40 EA (End Sem)-60	Dr. Satheesh C. Dr. Rakesh Saini Dr. Parvendra Kumar

Lectures/Hrs. 90

1. Learning Objectives:

The purpose of the course is to introduce students an improved understanding on various physical landscapes of India and enhance their analytical capacity to relate the diverse physical conditions.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the physiographic profile of the country
2. Understand the climatic conditions and its impacts in India
3. Apprise the synergy of drainage system, soils and forest resources in India.

3. Unit wise Learning Outcomes:

- UO 1. Learn about the major physiographic divisions of India.
 UO 2. Learn about Indian Monsoon system and their spatial characters.
 UO 3. Know about the major drainage system of India.
 UO 4. Learn about the process of pedogenesis and soil classification of India.
 UO 5. Recognise the major forest resources of India and relevant policy.

Unit	Content	Lecture/Period
Unit I	Physiographic divisions • Himalayas: origin and classification • Northern Plains: origin and classification • Peninsular India: origin and classification • Coastal areas & Islands	18
Unit II	Climate • Origin of monsoon • Branches of monsoon • Climatic regions	18
Unit III	Drainage Systems • Himalayan River system • Peninsular drainage system • In-land drainage system	18
Unit IV	Soil • Pedogenesis processes • Classification of Indian soil • Soil erosion and conservation	18
Unit V	Vegetation • Classification of forests • Deforestation and conservation • National forest policy	18

Essential Readings:

1. Khullar, D.r. India: A Comprehensive study kalyani pub., Luchiana, New Delhi, 2016.
2. Tiwari, R.C., Geography of India. Allahabad: Pravalika Publication. Allahabad, 2016.
3. Singh Gopal. A Geography of India. Atmaram and Sons, New Delhi. 2010.
4. Husain, Majid, Geography of India, McGraw-Hill Com. New Delhi, 2008.
5. frokjh v{kj- lh- Hkkjr dk Hkxksy] bylgkckn% iz;kx iqLrd Hkou] 2016
6. xkSre] vydk] Hkkjr dk c'gn Hkxksy] "kkjnk iLrd Hkou] bylgkckn] 2015

Suggested Readings:

1. Basham, A. L. The Wonder that was India. Picador, London. 2004.
2. Das, P.K., The Monsoon. National Book Trust of India, New Delhi. 2002.
3. Sharma, T.C. & Countinho O., Economic and Commercial Geography of India, Vikash Publication, New Delhi. 1998.
4. Singh, R. L., ed., India- A Regional Geography. N. G. S. India, Varanasi, 1971.
5. caIy] lqjs'k pan % Hkkjr dk o'gn Hkxksy] ehuk{kh izdk'ku] esjB 2015
6. plSgku ih- vkj- Hkkjr dk c'gn Hkxksy] olq/kjk izdk'ku] xksj[kiqj] 2013

GOG-AEC-111- Chain & Tape Surveying

Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L5 Sem I	GOG-AEC-111	Chain & Tape Surveying	L	T	P	C	IA (Mid)-40 EA (End Sem)- 60	Dr. Satheesh C. Dr. R. B. Anuragi Dr. Rakesh Saini
			30	0	0	2		

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce method of chain and tape surveying.

2. Course Learning Outcomes : After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of surveying.
2. Apprise and understand method of chain and tape surveying
3. Apply the techniques of chain and tape surveying in preparation of area plan map.

3. Unit wise Learning Outcomes :

- UO 1. Learn and appreciate the basics of surveying.
 UO 2. Learn about the basics of Chain and Tape surveying.
 UO 3. Learn about the setting of the Chain and Tape for preparation of map.
 UO 4. Learn about the different methods of Chain and Tape surveying.
 UO 5. Learn the survey plotting, construction of Map.

Unit	Content	Lecture/Period
Unit I	Introduction to surveying • Basic concept and methods • Types of north: true north, grid north and magnetic north	06
Unit II	Types of surveying • Geodetic and Plane surveying • Triangulation and Traverse surveying • Topographical surveying	06
Unit III	Chain & Tap Surveying • Basic concept and significance • Instruments of Chain & Tap Surveying	06
Unit IV	Methods of Chain & Tap Surveying • Traverse method: closed and open method • Triangulation method	06
Unit V	Surveying and Plotting • Survey process and steps • Preparation of field book • Construction of Area Plan	06

Essential Readings:

1. Singh L. R. Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad, 2016.
2. Sarkar, A. Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi, 2015.
3. Singh Gopal. Map Work and Practical Geography. Vikas Publishing, New Delhi. 2012
4. Singh, R.L. Elements of Practical Geography. Kalyani, New Delhi. 1991.
5. 'kek] t-ih- % izk;ksfxd Hkxksy] jLrksxh] esjB] 2016-
6. flag] vkj- ,y- % izk;ksfxd Hkxksy ds ewyrRo] dY;kokh] ub fnYyho 1991.
7. feJk vkj- ,u- ,o 'kekZ ih- ds-% izk;ksfxd Hkxksy] jkor ifCyds'ku t;iqj 2019

Suggested Readings:

1. Robinson, A.H. , et. al. Elements of Cartography. 6th ed. John Wiley, New York, 1995.
2. Misra, R.P. & A. Ramesh : Fundamentals of Cartography. Concept, New Delhi. 1989.
3. Monkhouse, F.J. Maps and Diagrammes. Methuen, London. 1982.
4. Raisz, E. General Cartography. John Wiley and Sons, New York 5th edition, 1962.

GOG-SEC-111- Introduction to Cartography								
Level& Semester	Course Code	Title of the Course	Credits				Marks	Course Coordinator
L5 Sem I	GOG-SEC-111	Introduction to Cartography	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. Satheesh C. Dr. Rakesh Saini Dr. R. B. Anuragi Dr. Hemant Patidar
			30	0	0	2		

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce the basics of cartography, their principles and applications in geographical studies.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the basics of cartographical methods in representation of variable earth features and processes.
2. Appreciate and understand the various principles, conventions and types of map-making.
3. Generate suitable map of the area of interest for relevant studies.

3. Unit wise Learning Outcomes:

- UO 1. Learn and appreciate the basics of cartography.
 UO 2. Learn about the branches of cartography.
 UO 3. Understand the historical development of cartography.
 UO 4. Know about the recent trends in cartography.
 UO 5. Learn the basics of Geo-informatics and their application.

Unit	Content	Lecture/Period
Unit I	Introduction to Cartography • Cartographic problems of the Earth • Meaning & Definition of Cartography • Nature and Scope of Cartography	06
Unit II	Branches of Cartography • Theoretical cartography • Analytical cartography • Applied cartography	06
Unit III	Development of cartography • Ancient cartography • Medieval cartography • Modern cartography	06
Unit IV	Recent trends in cartography • Aerial photographs • Satellite imageries	06
Unit V	Advanced techniques in cartography • Basics of Remote sensing • Basics of GIS and GPS • Hands on QGIS	06

Essential Readings:

1. Singh L. R. Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad, 2016.
2. Sarkar, A. Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi, 2015.
3. Singh Gopal. Map Work and Practical Geography. Vikas Publishing, New Delhi. 2012
4. Singh, R.L. Elements of Practical Geography. Kalyani, New Delhi. 1991.
5. 'kek] t-ih- % izk;ksfxd Hkxksy] jLrksxh] esjB] 2016-
6. flag] vkj- ,y- % izk;ksfxd Hkxksy ds ewyrRo] dY;kokh] ub fnYyho 1991.
7. feJk vkj- ,u- ,o 'kekZ ih- ds-% izk;ksfxd Hkxksy] jkor ifCyds'ku t;iqj 2019

Suggested Readings:

1. Robinson, A.H. , et. al. Elements of Cartography. 6th ed. John Wiley, New York, 1995.
2. Misra, R.P. & A. Ramesh : Fundamentals of Cartography. Concept, New Delhi. 1989.
3. Monkhouse, F.J. Maps and Diagrammes. Methuen, London. 1982.
4. Raisz, E. General Cartography. John Wiley and Sons, New York 5th edition, 1962.

Level 5
Second Semester

GOG DSM- 211- Human Geography

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L 5 Sem II	GOG- DSM- 211	Human Geography	L	T	P	C	IA (Mid)-40 EA (End Sem)- 60	Dr. Hemant Patidar Dr. R. B. Anuragi
			60	0	0	4		

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the processes and patterns of human occupancy through changing state of human understanding and use of Earth's surface by employing spatial concepts and landscape analysis of human organization and its environmental consequences.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the basic concepts in various sub-fields of human geography;
2. Appreciate the growth, distribution and composition of population in different parts of the world;
3. Analyse the types and patterns of rural and urban settlements, urbanisation and related issues in India and other regions of the world.
4. Appreciate the nature and quality of human landscapes.

3. Unit wise Learning Outcomes:

- UO 1. Learn about the nature and scope of human geography.
 UO 2. Know about the concept, division and distribution of human races.
 UO 3. Understand the basic characteristics and distribution of human population in the world.
 UO 4. Recognise the different types of human settlement in their geographic contexts.
 UO 5. Learn the significance of geographic spaces on international politics.

Unit	Content	Lecture/Period
Unit I	Introduction to Human Geography • Meaning, Nature, scope and relevance of human Geography • Man–Environment relationships • Cultural regions of the world: classification and its attributes	12
Unit II	Human Races • Human races: concept, Division characteristics and • Distribution human races in the world and India • Human Adaptation to the natural environment: Eskimo, Bushman and Pigmy	12
Unit III	Human Population • Growth, Distribution and density of population • Migration: types, causes and consequences • Trends of urbanization	12
Unit IV	Human Settlements • Rural settlements: Types and patterns • Urban settlements: evolution and classification • Theories of urban settlements	12
Unit V	Geo-politics • Geo-politics, Indian Ocean and World politics • Nation, state and nation-state • Frontiers and Boundaries	12

Essential Readings

1. Hussain Mazid, *Human geography*, Anmol Publication, New Delhi, 2014.
2. Shelar, S. K. *Human Geography*. Chandralok Prakashan, Kanpur. 2012.
3. Singh, L.R. *Fundamentals of Human Geography*. Sharda Pustak Bhawan, Allahabad, 2012.
4. Prajapati, R. V. *Principles of Human Geography*. Cyber Tech. Publication. New Delhi. 2011.
5. Knowles R. & Wareing J., *Economic and Social Geography*, Rupa Publication, New Delhi, 2004.
6. dkSf'kd] ,l-Mh-% ekuo Hkxksy] jLrksxh] esjB] 2015
7. gqIsu] ekftn % ekuo Hkxksy] jkor ifcyds'kUl] t;iqj] 2014
8. flag] oh ,u-% ekuo Hkxksy] bylgkckn% iz;ix iqlrd Hkou] 2003

Suggested Readings

1. Dikshit, R.D. *Geographical Thought: A Contextual History of Ideas*. Prentice-Hall of India, New Delhi. 2016.
2. Chandna, R.C. *Population Geography*. Kalyani Publisher, New Delhi. 2015.
3. Whyrne, Hammond, Charles. *Elements of Human Geography*, George Allen & Unwin, London, 1985.
4. Brock, J.C. & J.W. Webb, *Geography of Mankind*. McGraw Hills, New York. 1978.
5. Chisholm, M. *Human Geography Evolution or Revolution*. 1975
6. DeBlij, H.J. *Human Geography- Culture Society and Space*. John Wiley, New York, 1996.
7. Haggett, Peter, et al. *Locational Models*. Arnold Heinemann, 1979.
8. Llyod, P.E. & P. Dicken *Location in Space*. Harper & Row, London.
9. Smith, D.M. *Human Geography – A Welfare Approach*. Arnold Heinemann, London, 1984.
10. Ambrose, Peter *Analytical Human Geography*. Longman, 1970.
11. pkanuk] jes'kpUn% tula[;k Hkxksy] dY;kokh] ubZ fnYyh 2015
12. iaMk] ch-ih- tula[;k Hkxksy] e-iz- fgUnh xFk vdkneh] Hkksiky] 2004-

GOG DSM- 212- Relief Analysis and Surveying (Practical)

Level& Semester	Course Code	Title of the Course	Credits				Marks	Course Coordinator
L5 Sem II	GOG- DSM- 212	Relief Analysis and Surveying (Practical)	L	T	P	C	IA (Mid)-40 EA (End Sem)- 60	Dr. Satheesh C. Dr. Rakesh Saini Dr. R. B. Anuragi
			0	0	30	2		

Lectures/Hrs. 60

1. Learning Objectives:

Course Objectives: The purpose of the course is to introduce students the procedures of representation, surveying and mapping.

2. Course Learning Outcomes : After the completion of the course, the students will have the ability to:

1. Distinguish between various types of maps and also appreciate the elements of map;
 2. Appreciate how projections are applied to prepare maps from the globe;
 3. Understand the basic principles of surveying
 4. Acquire knowledge to interpretation of Topographic maps
- The purpose of the course is to introduce students the basics of map science, basic reading and interpretational skills.

3. Unit wise Learning Outcomes :

- UO 1. Know and appreciate the major relief representation techniques.
 UO 2. Learn the methods of contouring and role of profiles in landscape depiction and analysis.
 UO 3. Learn about the basics of topographic maps and their classification.
 UO 4. Learn about the fundamentals of surveying.
 UO 5. Learn about the basics of chain and tape surveying.

Unit	Content	Period/Hours
Unit I	Relief representation • Hachure, Shading, spot heights, and Bench Mark • Contours: Representation of different landforms • Contours interpolation	12
Unit II	Contouring • Contour inspection method, Cross-section method and Gradient method • Cross Profiles: Types- Serial, Superimposed, composite, projected • Relevance in landforms mapping and analysis	12
Unit III	Topographic maps • Classification and Numbering • Conventional Sign; • Interpretation of physical and cultural features	12
Unit IV	Surveying • Basic principles of surveying • Types of surveying- Geodetic and Plane • Triangulation and Transverse surveying	12
Unit V	Chain and tape surveying • Open traverse • Closed traverse • Tie line method	12

Essential Readings

1. Singh L. R. *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad, 2016.
2. Singh, R.L. *Elements of Practical Geography*. Kalyani, New Delhi. 1991.
3. Sarkar, A. *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi, 2015
4. 'kekZ] ts-ih- % SinghGopal. *Map Work and Practical Geography*. Vikas Publishing, New Delhi. 2012
5. izk;ksfxd Hkxksy] jLrksxh] esjB] 2016-
6. feJk vLj- ,u- ,o 'kekZ ih- ds-% izk;ksfxd Hkxksy] jlor ifCyds'ku t;iq 2019

Suggested Readings

1. Robinson, A.H, et. al. *Elements of Cartography*. 6th ed. John Wiley, New York, 1995.
2. Misra, R.P. & A. Ramesh : *Fundamentals of Cartography*. Concept, New Delhi. 1989.
3. Monkhouse, F.J. *Maps and Diagrammes*. Methuen, London. 1982.
4. Raisz, E. *General Cartography*. John Wiley and Sons, New York. 5th edition, 1962.
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GOG-MDM-211- Resource Geography of India

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L5 Sem II	GOG-MDM-211	Resource Geography of India	L 90	T 0	P 0	C 6	IA (Mid)-40 EA (End Sem)-60	Dr. R. B. Anuragi Dr. Satheesh C. Dr. Hemant Patidar

Lectures/Hrs. 90

- Course Objectives:** The purpose of the course is to introduce students about the state and distribution of resources in India.

2. Course Learning Outcome:

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

- Understand resource profile of the country.
- Evaluate the resource base, and potential and problems of resource development in India.
- Comprehend the importance of resource development and conservation in India.

3. Unit wise Learning Outcomes:

- UO 1. Know the resource base and resource regions of India.
 UO 2. Know the different types of water resources and drainage systems of India.
 UO 3. Recognise the forest resources and their economic and environmental significance.
 UO 4. Learn about classification and distribution of mineral resources of India.
 UO 5. Learn about classification and distribution of power resources of India.

Unit	Content	Lecture/Period
Unit I	Resource base of India - Definition and Classification - Resource reserves & potentials - Resource regions of India - Resource conservation	18
Unit II	Water resource - Ground water resource - Surface water resource - Drainage systems	18
Unit III	Forest resource - Classification of forests - Economic and Environmental Significance of forest - Forest resource: degradation & conservation	18
Unit IV	Mineral resources - Types and importance - metallic minerals - Non-metallic minerals	18
Unit V	Power resources - Conventional sources - Non-conventional sources - Problems and policies	18

Essential Readings:

1. Khullar, D.r. India: A Comprehensive study kalyani pub., Luchiana, New Delhi, 2016.
2. Tiwari, R.C., Geography of India. Allahabad: Pravalika Publication. Allahabad, 2016.
3. Singh Gopal. A Geography of India. Atmaram and Sons, New Delhi. 2010.
4. Husain, Majid, Geography of India, McGraw-Hill Com. New Delhi, 2008.
5. frokjh vj- lh- Hkkjr dk Hkxksy] bykgckn% iz;lx iqlrd Hkou] 2016
6. xkSre] vydk] Hkkjr dk c'gn Hkxksy] "kkjnk iqlrd Hkou] bykgckn] 2015

Suggested Readings:

1. Basham, A. L. The Wonder that was India. Picador, London. 2004.
2. Das, P.K., The Monsoon. National Book Trust of India, New Delhi. 2002.
3. Sharma, T.C. & Countinho O., Economic and Commercial Geography of India, Vikash Publication, New Delhi. 1998.
4. Singh, R. L., ed., India- A Regional Geography. N. G. S. India, Varanasi, 1971.
5. caly] lqj's'k pan % Hkkjr dk o'gn Hkxksy] ehuk{kh izdk'ku] esjB 2015
6. plSgku ih- vkj- Hkkjr dk c'gn Hkxksy] olq/kjk izdk'ku] xksj[kiqj] 2013

GOG-AEC-211- Prismatic Compass Survey

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L5 Sem II	GOG- AEC- 211	Prismatic Compass Survey	L 30	T 0	P 0	C 2	IA (Mid)-40 EA (End Sem)-60	Dr. R. B. Anuragi Dr. Satheesh C. Dr. Parvendra Kumar

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce methods of prismatic compass surveying.

2. Course Learning Outcomes : After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of surveying.
2. Apprise and understand method of prismatic compass surveying.
3. Apply the techniques of prismatic compass surveying in preparation of area plan.

3. Unit wise Learning Outcomes :

- UO 1. Learn and appreciate the basics of surveying.
 UO 2. Learn about the basics of prismatic compass surveying and types of bearing.
 UO 3. Learn about the setting of the prismatic compass for preparation of map.
 UO 4. Learn about the different methods of prismatic compass surveying.
 UO 5. Learn the survey plotting, construction and corrections in bearing.

Unit	Content	Lecture/Period
Unit I	Introduction to surveying - Basic concept and methods - Basic methods of surveying - Plane & Geodetic Open and Closed Traverse	06
Unit II	Prismatic Surveying - Basic concept, methods and significance - Instruments of Prismatic Surveying - Types of bearing: Whole Circle Bearing and Quadrant Bearing - True, Magnetic and Assumed bearing	06
Unit III	Prismatic Surveying Process - Setting of the prismatic compass - Reading of bearing - Preparation of field book	06
Unit IV	Methods of Prismatic Surveying - Radiation Method - Intersection Method - Traverse (Open and Closed) Method - Resection Method	06
Unit V	Surveying and Plotting - Correction of bearings - Construction of Area Plan - Merits & Demerits of Prismatic Surveying	06

Essential Readings:

1. Singh L. R. Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad, 2016.
2. Sarkar, A. Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi, 2015.
3. Singh Gopal. Map Work and Practical Geography. Vikas Publishing, New Delhi. 2012
4. Singh, R.L. Elements of Practical Geography. Kalyani, New Delhi. 1991.
5. 'kek] t-ih- % izk;ksfxd Hkxksy] jLrksxh] esjB] 2016-
6. flag] vkj- ,y- % izk;ksfxd Hkxksy ds ewyrRo] dY;kokh] ub fnYyho 1991.
7. feJk vkj- ,u- ,o 'kekZ ih- ds-% izk;ksfxd Hkxksy] jlor ifCyds'ku t;iq 2019

Suggested Readings:

1. Robinson, A.H. , et. al. Elements of Cartography. 6th ed. John Wiley, New York, 1995.
2. Misra, R.P. & A. Ramesh : Fundamentals of Cartography. Concept, New Delhi. 1989.
3. Monkhouse, F.J. Maps and Diagrammes. Methuen, London. 1982.
4. Raisz, E. General Cartography. John Wiley and Sons, New York 5th edition, 1962.

GOG-SEC-211- Introduction to Statistical Methods in Geography

Level& Semester	Course Code	Title of theCourse	Credits				Marks	Course Coordinator
L5 Sem II	GOG- SEC-211	Introduction to Statistical Methods in Geography	L 30	T 0	P 0	C 2	IA (Mid)-40 EA (End Sem)-60	Dr. Hemant Patidar Dr. Satheesh C. Dr. Rakesh Saini

Lectures/Hrs. 30

Learning Objectives:

The purpose of the course is to introduce the students the basic statistical methods and their applicability in geographical studies.

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

1. Understand the basic concept, types and formats of data.
2. Understand the basic statistical methods for data analysis.
3. Analyse and interpret geographical variables with appropriate statistical techniques.

Unit wise Learning Outcomes :

- UO 1. Learn and appreciate the major data types.
- UO 2. Learn about the techniques of data tabulation and classification.
- UO 3. Learn the measures of central tendency and their application.
- UO 4. Learn about measures of dispersion and application.
- UO 5. Learn about the measures of correlation.

Unit	Content	Lecture/Period
Unit I	Introduction to Data • Meaning & Definitions • Types of Data: Primary & Secondary • Types of data series	12
Unit II	Tabulation and Classification • Classification and Tabulation of data • Representation of data: Histogram, frequency polygon, Ogive curve	12
Unit III	Measures of Central Tendency • Arithmetic mean • Median • Mode	12
Unit IV	Measures of dispersion • Range • Mean deviation • Standard deviation	12
Unit V	Measures of Correlation • Scatter diagram • Karl Pearson's Correlation • Spearman's Rank Correlation	12

Essential Readings:

1. Mahmood Aslam. Statistical Methods in Geographical Studies, Rajesh Publication. New Delhi. 2016.
2. Singh L. R. Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad, 2016.
3. Sarkar, A. Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi, 2015.
4. Singh Gopal. Map Work and Practical Geography. Vikas Publishing, New Delhi. 2012
5. Gupta, S.P. Advanced Practical Statistics, Sultan Chand and Company, New Delhi. 1998.
6. Zamir, A. Statistical Geography: Methods and Applications, Rawat Publications, Jaipur. 2003.
7. Mahmood, A. Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi. 1986.
8. 'kek] t-ih- izk;ksfxd Hkxksy] jLrksxh] esjB] 2016-
9. feJk vkj- ,u- ,o 'kekZ ih- ds-% izk;ksfxd Hkxksy] jkor ifCysd'ku t;iqj 2019

Suggested Readings:

1. Bhagwathi, V. and Pillai, R.S.N. Practical Statistics, Sultan Chand and Company, New Delhi. 2003.
2. Robinson, A.H. et. al.: Elements of Cartography. 6th ed. John Wiley, New York, 1995.
3. Singh, R.L. Elements of Practical Geography. Kalyani, New Delhi. 1991.
4. Misra, R.P. & A. Ramesh. Fundamentals of Cartography. Concept, New Delhi. 1989.
5. Monkhouse, F.J. Maps and Diagrammes. Methuen, London. 1982.
6. Ebdon, D. Statistics in Geography: A Practical Approach, Blackwell Publishers Inc., Massachusetts. 1977.
7. Gregory, S. Statistical Methods and the Geographer, Longman, London. 1973.
8. Raisz, E. General Cartography. John Wiley and Sons, New York. 5th edition, 1962.
9. flag] vkj- ,y- izk;ksfxd Hkxksy d ewyrRo] dY;kokh] ub fnYyho 2015.

Essential e-Resources

1. [Statistical methods for geography | WorldCat.org](#)
2. [18MAG23C-U1.pdf \(gacbe.ac.in\)](#)
3. [Sample Chapter: Elementary Statistics for Geographers: Third Edition \(guilford.com\)](#)

Level 6
Third Semester

GOG DSM- 311 - Economic Geography									
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator	
L6 Sem III	GOG-DSM-311	Economic Geography	L	T	P	C	IA (Mid)-40	Dr. R. B. Anuragi Dr. Hemant Patidar	
			60	0	0	4	EA (End Sem)-60		

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the spatiality of resources, production of resources and regional distribution pattern

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

- i. Understand the components of major different sectors of economic production;
- ii. Appreciate and understand various economic resources of the world;

3. Unit wise Learning Outcomes:

- UO 1. Know about the different dimensions of economic geography.
- UO 2. Learn about the agricultural resources at global level.
- UO 3. Understand the major mineral resources in the world.
- UO 4. Understand the major manufacturing processes in the world
- UO 5. Learn about means of transportation in the world.

Unit	Content	Lecture/Period
Unit I	Introduction to Economic Geography - Economic geography: Definition, Scope and Significance - Sectors of economic activity: Primary, Secondary and Tertiary - Agriculture: Primary crops-Wheat, Rice and Maize.	12
Unit II	Agriculture and Fisheries - Agriculture: Commercial crops –Cotton, Sugarcane, Tea, Coffee - Fisheries – factors and important fishing grounds; Agriculture regions of the world.	12
Unit III	Types of Resources - Mineral resources: Iron ore, Bauxite, manganese and Copper - Power resources: Coal, petroleum and hydroelectric power - Non-conventional sources of energy- types and potentials; Atomic energy.	12
Unit IV	Manufacturing industries - Manufacturing industries: locational factors, distribution and production - Iron and steel: (USA, Russia and Germany) - Textile (cotton and wollen) -(USA, China and Japan); Petro-chemical.	12
Unit V	Trade and Transportation - World Transportation: Relative significance of different means of transport- Land, Air and Water, Factors affecting land, water and air transport - World oceanic routes; important inland waterways and important canals - International trade, Impact of globalization on economic development.	12

Essential Readings

1. Singh K. & Siddiqui A. R. *Economic Geography*, Pravalika Publisher, Allahabad. 2016.
2. Roy, P. K. *Economic geography: A Study of Resources*, New Central Book Agency Ltd. Kolkata, 2014.
3. Saxena, H. M. *Economic geography*. Rawat Publication. New Delhi. 2013.
4. Sharm, T.C. *Economic geography of India*, Rawat Publication. New Delhi. 2013.
5. Knowles R. & Wareing J., *Economic and Social Geography*, Rupa Publication, New Delhi, 2004.
6. Brynt, R. H., *Economic and Social Geography*, Made Simple Book, Rupa Publication, New Dehi, 1990.
7. flag] dk'khukFk ,oa txnh'k flag vkfFkZd Hkwksy ds ewwyrRo] Kkuksn;) xksj[kiqj 2002

Suggested Readings

1. Guha, J. L. & Chhotoraj, P. R. *A New Approach to Economic geography: A Study of Resources*. World Press Pvt. Ltd. Kolkata. 2001.
2. Wheeler, J.O. et.al. *Economic Geography*. John Wiley, New York, 1995.
3. Hartshorn, T.N. & J.W. Alexander: *Economic Geography*. Prentice Hall India, New Delhi, 1988.
4. Smith, D.M. ;*Human Geography – A Welfare Approach*. Arnold Heinemann, London, 1984.
5. Smith, D.M: *Industrial Location- An Economic Geographical Analysis*. John Wiley, New York, 1981.
6. Leong, G. C. and Morgan, G. C. Human and Economic Geography. Oxford Economic Press. 1973.
7. Mc Carty, H.H. & J.B. Lindberg: *A Preface to Economic Geography*. Prentice Hall, New Jersey. 1966.

GOG DSM- 312- Representation of Data and Surveying (Practical)

Level& Semester	Course Code	Title of the Course	Credits				Marks	Course Coordinator
L6 Sem III	GOG- DSM-312	Representation of Data and Surveying (Practical)	L	T	P	C	IA (Mid)-40 EA (EndSem)- 60	Dr. Parvendra Kumar Dr. R. B. Anuragi
			0	0	30	2		

Lectures/Hrs. 60

1. Learning Objectives:

Course Objectives: The purpose of the course is to acquaint with the methods of representation of data and techniques of prismatic compass surveying.

2. Course Learning Outcomes :

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

1. Competent to represent data in graphical and diagrammatic manner
2. Improve the quality to represent isopleths mapping.
3. Understand the basic principles of prismatic compass surveying.

3. Unit wise Learning Outcomes :

- UO 1. Know the methods of graphical data representation.
 UO 2. Learn the methods of diagrammatic data analysis.
 UO 3. Learn about the basics of isopleths mapping.
 UO 4. Learn about the fundamentals of prismatic compass surveying.
 UO 5. Learn about field methods of prismatic compass surveying.

Unit	Content	Period/Hours
Unit I	Data and Representation: One Dimensional • Diagrammatic representation of geographical data: types and their uses; • One-dimensional: Line diagram, bar diagrams- simple bar, compound bar • Multiple bar diagram; pyramid diagram- age-sex pyramid.	12
Unit II	Data and Representation: Two Dimensional • Two-dimensional: Square and Rectangular diagrams, Pie diagram • Three-dimensional: Cube, and Sphere diagrams.	12
Unit III	Isopleth Maps • Distribution maps: Dot, Isopleth, Choropleth, Chorochromatic • Choroschematic methods and their characteristics.	12
Unit IV	Introduction to Prismatic compass survey • Prismatic compass survey: Principles; Methods • Introduction to the Instruments	12
Unit V	Mapping with Prismatic compass • Field Surveying: Prismatic compass survey • Radiation and Inter-section methods.	12

Essential Readings

1. Singh L. R. **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad, 2016.
2. Sarkar, A. **Practical geography: A systematic approach**. Orient Black Swan Private Ltd., New Delhi, 2015.
3. Singh Gopal. **Map Work and Practical Geography**. Vikas Publishing, New Delhi. 2012
4. Misra, R.P. & A. Ramesh. **Fundamentals of Cartography**. Concept, New Delhi. 1989.

5. 'kekZ] ts-ih- izk;ksfxd Hkwxsy] jLrksxh] ifCysd'ku esjB] 2015-
6. feJk vkj- ,u- ,oa 'kekZ ih- ds-% izk;ksfxd Hkwxsy] jkor ifCysd'ku t;iqj 2019
7. ih- vkj- Hkkjr dk c'gn Hkxsy] oLq/kjk izdk'ku] xksj[kiqj] 2013

Suggested Readings

1. Robinson, A.H, et. al. **Elements of Cartography**. 6th ed. John Wiley, New York, 1995.
2. Misra, R.P. & A. Ramesh : **Fundamentals of Cartography**. Concept, New Delhi. 1989.
3. Monkhouse, F.J. **Maps and Diagrammes**. Methuen, London. 1982.
4. Raisz, E. **General Cartography**. John Wiley and Sons, New York. 5th edition, 1962.
5. flag] vkj- ,y- % izk;ksfxd Hkxsy ds ewyrRo] dY;kokh] ub fnYyho 2015.

GOG-MDM-311- Indian Monsoon Mechanism

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L6 Sem III	GOG- MDM-311	Indian Monsoon Mechanism	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. Rakesh Saini Dr. Parvendra Kumar Dr. Satheesh C.
			90	0	0	6		

Lectures/Hrs. 90

1. Learning Objectives:

The purpose of the course is to introduce students with an improved understanding of Monsoon system and its spatial variation in Indian subcontinent

2. Course Learning Outcomes: after the completion of the course, the candidate will have the ability to:

1. Understand the mechanism of monsoon origin in Indian subcontinent.
2. Understand the spatial and temporal variation of monsoon in Indian subcontinent.
3. Appraise the importance of Monsoon in global wind circulation model.

3. Unit wise Learning Outcomes:

- UO 1 Learn the concept of Monsoon and its importance as a study.
- UO 2 Learn about the types of Monsoon and their spatial and temporal character.
- UO 3 Understand the Classical views of Monsoon origin.
- UO 4 Understand the modern concepts of Monsoon origin in relation to global wind circulation.
- UO 5 Recognise the trend and pattern of Monsoon behaviour through proxies.

Unit	Content	Lecture/Period
Unit I	Introduction to Monsoon: • Concept, definition • Importance of the Monsoon as a subject to study.	10
Unit II	Types of Monsoon: • South West Monsoon, • Winter Monsoon. • Onset timing of Summer Monsoon in India and its spatial variations. • Winter Monsoon and its spatial precipitation characteristics, • Monsoon Break, Monsoon Burst, • Pre Monsoon weather activities in Indian subcontinent.	26
Unit III	Theories of Monsoon origin: • Traditional views of monsoon origin; • Differential Land & Sea heating during winter and summer; • Pattern of wind.	18
Unit IV	Modern views of monsoon origin; • Role of Tibetan High, • Westerlies, Somali upwelling, • ENSO, El-Nino/ La-Nino, South East Trade winds etc	18
Unit V	Trend and Pattern in Monsoon activities in Indian Subcontinent: • Proxies of palaeo and present monsoon reconstruction • The role of Monsoon in global wind circulation.	18

Essential Readings:

1. Anthony J. Voga, and Robert V. Rohli, **Climatology**. Jones & Bartlett Learning, 2017.
2. Siddhartha, K. **Oceanography A Brief Introduction**, National Book Trust, New Delhi. 2013
3. Garrison Tom, **Essentials of Oceanography**. Brooks/ Cole, C.A., USA, 2011. (International Ed.). Singh Savindra, **Climatology**, Prayaga Pustak Bhawan, Allahabad, 2006.
4. Singh, Sukhvinder, **Oceanography**, Wisdom Press, New Delhi. 2014.
5. Malik Ramesh. **Oceanography**. Sonali Publication. New Delhi. 2012.
6. Lal, D.S. **Climatology**, chaitanya publication, Allahabad, 1986
7. pkScs] dSyk'k HkkSfrd Hkwksy% ok;qeaMy ,oa tyeaMy]] e-iz- fgUnh xzaFk vdkneh] Hkksiky] 2009-

Suggested Readings:

1. Berry, B.J.L. and Chorley, P.J. **Atmosphere weather and climate**, Routledge India, New Delhi, 2009.
2. Menon, P. A. 2007. **Ways of the Weather**, National Book Trust, New Delhi. 2007.
3. Das, P. K. **The Monsoon**. National Book Trust, India, New Delhi. 2000.
4. Critchfield, J.S. **General Climatology** prentice Hall, India, 1993
5. Trewarth, G. T. An Introduction to Climate. McGraw Hills Inc. New York, 1991.
6. Peterson, **Introduction to meteorology** McGraw Hill Book London, 1969
7. flag] lfoUnz% tyok;q foKku] izokfydk izdk'ku] xksj[kiqj 2016
8. flag lfoUnz % HkkSfrd Hkwksy] izokfydk izdk'ku] xksj[kiqj 2017

GOG-AEC-311- Plane Table Surveying

Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L6 Sem III	GOG- AEC-311	Plane Table Surveying	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. R. B. Anuragi Dr. Hemant Patidar
			30	0	0	2		

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce method of plane table surveying.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of surveying.
2. Apprise and understand method of plane table surveying
3. Apply the techniques of plane table surveying in preparation of area plan map.

3. Unit wise Learning Outcomes:

- UO 1. Learn and appreciate the basics of surveying.
 UO 2. Learn about the basics of plane table surveying.
 UO 3. Learn about the setting of the plane table for preparation of map.
 UO 4. Learn about the different methods of plane table surveying.
 UO 5. Learn the survey plotting, construction of Map.

Unit	Content	Lecture/Period
Unit I	Introduction to surveying - Basic concept and methods - Types of north: true north, grid north and magnetic north	06
Unit II	Types of surveying - Geodetic and Plane surveying - Triangulation and Traverse surveying - Topographical surveying	06
Unit III	Plane Table Surveying - Basic concept and significance - Instruments of Plane Table Surveying	06
Unit IV	Methods of Plane Table Surveying - Radiation method - Intersection method - Resection method	06
Unit V	Surveying and Plotting - Survey process and steps - Preparation of field book - Construction of Area Plan with various methods	06

Essential Readings:

1. Singh L. R. Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad, 2016.
2. Sarkar, A. Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi, 2015.
3. Singh Gopal. Map Work and Practical Geography. Vikas Publishing, New Delhi. 2012
4. Singh, R.L. Elements of Practical Geography. Kalyani, New Delhi. 1991.
- 5^ए शर्मा, ज.पी. : प्रायोगिक भूगोल, रस्तेगी, मेरठ, 2016.
- 6^ए सिंह, आर. एल. : प्रायोगिक भूगोल के मूलतत्त्व, कल्याणी, नई दिल्ली 1991^ए
- 7^ए मिश्रा आर. एन. एव शर्मा पी. के. प्रायोगिक भूगोल, रावत पब्लिकेशन जयपुर 2019

Suggested Readings:

1. Robinson, A.H. , et. al. Elements of Cartography. 6th ed. John Wiley, New York, 1995.
2. Misra, R.P. & A. Ramesh : Fundamentals of Cartography. Concept, New Delhi. 1989.
3. Monkhouse, F.J. Maps and Diagrammes. Methuen, London. 1982.
4. Raisz, E. General Cartography. John Wiley and Sons, New York 5th edition, 1962.

GOG-SEC-311- Introduction to Regional Planning & Development

Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L6 Sem III	GOG -SEC- 311	Introduction to Regional Planning & Development	L 30	T 0	P 0	C 2	IA (Mid)-40 EA (End Sem)-60	Dr. Hemant Patidar Dr. R B Anuragi

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce the basics of cartography, their principles and applications in geographical studies.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the basics of region.
2. Examine the importance of planning for development
3. Understand the theories of regional development.
4. To cope with better understanding on regional development.

3. Unit wise Learning Outcomes:

UO 1. Learn and appreciate the basics of region.

UO 2. Learn about the idea of development thoughts.

UO 3. Understand the history of regional planning in India.

UO 4. Know about the about the application of development theories.

UO 5. Learn the basics of preparing project report on regional development.

Unit	Content	Lecture/Period
Unit I	Concept of Region - Regional Concept of in Geography - Types of region: Formal and Functional, Uniform and Nodal Single feature region and Multi feature region. - Methods for delineation of region; Planning: Meaning and Definition.	06
Unit II	Regional Planning - Regional planning: Concept and scope of regional planning - Approaches to regional planning; India. - Significance of regional Planning and planning region.	06
Unit III	Regional Planning in India - Regional Planning in India: Sectoral and Regional planning in India - Need for regional planning in India, Historical Back Ground of Regional Planning in India. - Planning Region: concept, characteristics and delineation; Planning regions of India.	06
Unit IV	Regional Development - Regional Development: Concept and Indicators - Regional imbalance, Regional disparities in socio- economic development. - Theories of regional development: Growth pole theory.	06

Unit V	Project report Project report: A project report assignment of regional development and disparity of a geographical unit area with the constant guidance from a faculty member.	06
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Essential Readings:

1. Gupta, H. S. **Regional Development and Planning**. Kalyanai Publication, New Delhi. 2017.
2. Chandana, R. C. **Regional Planning and Development**, Kalyani Publication. 2016.
3. Mishra R. P. *Regional Planning: Concepts, Techniques, Policies and Case Studies*. Concept, 2002
4. Sundram K. V. **Geography of Planning**. Concept Publishing Co. New Delhi, 2012.
5. Sundram K. V. **Development Planning at the Grass Roots**, Concept, 2012
6. Chandana, R.C., **Regional Development and Planning**. Kalyani Publishers, New Delhi, 2005.
7. Dube, K.K. and Singh, M.B. **Pradeshik Niyojan**. Tara Book Agency, Varanasi, 1986.

Suggested Readings:

1. Chand, M. and Puri, V.K. **Regional planning in India**; Allied Publishers, New Delhi, 2016.
2. Publishing Co. New Delhi, 2012.
3. Haynes J., **Development Studies**, Polity Short Introduction Series, 2008.
4. Bhat, L.S. **Micro Planning: A Case Study of Karnal Area**, KB Publications, New Delhi, 2003.
i. Publishing, New Delhi, 2002.
5. Claval P.I., **An Introduction to Regional Geography**, Blackwell Publishers, Delhi, 1998.
6. Mishra, R.P, Sundaram, K.V., and Prakasarao, V.L.S. **Regional Development** MIT Press, Massachusetts, 1976.
7. Kuklinski, A.R. **Growth Centres in Regional Planning**. Mouton & Company, Paris, 1972.
8. Bhat, L.S. **Regional Planning in India**, Indian Statistical Institute, Calcutta, 1972.
9. Blij H. J. De, **Geography: Regions and Concepts**, John Wiley and Sons, 1971.
10. Johnson E. A. J. **The Organization of Space in Developing Countries**, MIT Press, 1970.
11. Friedman, J. and Alonse, W. (eds.), **Regional Development and Planning**, M.I.T. Press, Cambridge-Massachusetts, 1968.
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14. JhokLro] "kekZ ,oa pkSgku izknsf'kd fu;kstu vkSj larqfyr fodkl] olqU/kjk izdk'ku] xksj[kiqj] 2017

Level 6
IV Semester

GOG DSM- 411- Physical Geography- Climatology and Oceanography								
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L6 Sem IV	GOG -DSM-411	Physical Geography- Climatology and Oceanography	L	T	P	C	IA (Mid)-40	Dr. Rakeash Saini Dr. Parvendra Kumar Dr. Satheesh C
			60	0	0	4	EA (End Sem)-60	

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the spatiality of atmosphere and hydrosphere, distribution of atmospheric and oceanic elements and its functioning

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the components of atmosphere and oceans;
2. Appreciate and understand spatial and temporal factors controlling atmosphere and composition and movements in the ocean.

3. Unit wise Learning Outcomes:

- UO 1. Know about the different composition of atmosphere.
UO 2. Makes better understating on components of atmosphere.
UO 2. Learn about the bottom ocean topography.
UO 3. Understand the composition of the ocean.

Unit	Content	Lecture/Period
Unit I	Introduction to climatology; • Elements of weather and climate; composition and structure of the atmosphere; • Temperature: horizontal and vertical distribution; • Atmospheric pressure and pressure belts; • Winds: planetary, periodic and local.	12
Unit II	Atmospheric Components • Moisture –Humidity; processes of evaporation and condensation; • Air Masses, Fronts: Origin, Classification and Characteristics; Atmospheric Disturbances: • Cyclone: tropical and temperate; theories of origin and associated weather conditions.	12
Unit III	Types of precipitation: • Pattern of Rainfall at Global, Regional and seasonal scales; • Climatic classification by Koppen; • Global Warming, climate change: causes, consequences and measures of control.	12
Unit IV	Introduction to Oceanography • Surface configuration of the ocean floor; Relief of Atlantic, Pacific, and Indian Oceans; • Temperature of Oceanic water: horizontal and vertical distribution; • Salinity of Oceanic water: composition, sources and horizontal and vertical distribution.	12
Unit V	Circulation of oceanic water: • Waves, currents, streams, drifts; Currents of Atlantic, Pacific and Indian Ocean; • Tides –Causes, Types and Theories; Coral reefs: types, formation, theories; coastal environment; • Marine deposits, Importance of ocean as storehouse of resources.	12

Essential Readings:

1. Anthony J. Voga, and Robert V. Rohli, ***Climatology***. Jones & Bartlett Learning, 2017.
2. Siddhartha, K. ***Oceanography A Brief Introduction***, National Book Trust, New Delhi. 2013
3. Garrison Tom, ***Essentials of Oceanography***. Brooks/ Cole, C.A., USA, 2011. (International Ed.). Singh Savindra, ***Climatology***, Prayaga Pustak Bhawan, Allahabad, 2006.
4. Singh, Sukhvinder, ***Oceanography***, Wisdom Press, New Delhi. 2014.
5. Malik Ramesh. ***Oceanography***. Sonali Publication. New Delhi. 2012.
6. Lal, D.S. ***Climatology***, chaitanya publication, Allahabad, 1986
7. pkScs] dSyk'k HkkSfrd Hkwxsy% ok;qeaMy ,oa tyeaMy]] e-iz- fgUnh xzaFk vdkneh] Hkksiky] 2009-

Suggested Readings:

1. Berry, B.J.L. and Chorley, P.J. ***Atmosphere weather and climate***, Routledge India, New Delhi, 2009.
2. Menon, P. A. 2007. ***Ways of the Weather***, National Book Trust, New Delhi. 2007.
3. Das, P. K. ***The Monsoon***. National Book Trust, India, New Delhi. 2000.
4. Critchfield, J.S. ***General Climatology*** prentice Hall, India, 1993
5. Trewarth, G. T. An Introduction to Climate. McGraw Hills Inc. New York, 1991.
6. Peterson, ***Introduction to meteorology*** McGraw Hill Book London, 1969
7. flag] lfoUnz% tyok;q foKku] izokfydk izdk'ku] xksj[kiqj 2016
8. flag lfoUnz % HkkSfrd Hkwxsy] izokfydk izdk'ku] xksj[kiqj 2017

GOG DSM- 412- Weather Interpretation & Forecasting (Practical)

Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L6 Sem IV	GOG-DSM-412	Weather Interpretation & Forecasting (Practical)	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. Rakesh Saini Dr. Parvendra Kumar
			60	0	0	4		

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the Climate data analysis and representation

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the methods of data representation;
2. Appreciate and understand interpretation of weather maps;

3. Unit wise Learning Outcomes:

- UO 1. Know about the different dimensions of weather mapping and data representation.
 UO 2. Learn about the mapping of climatic data.
 UO 3. Competable in using weather instruments.
 UO 4. Understand the ways of weather data collection.
 UO 5. Learn about interpretation of weather maps.

Unit	Content	Lecture/Period
Unit I	Weather Interpretation: Weather symbols, Representation of atmospheric features: temperature, pressure and rainfall data by Line Graph simple, polygraph, compound, ergograph, climograph and hythergraph.	12
Unit II	Mapping Isopleth maps- uses, merits and demerits- Isotherm, Isobars and Isohyets.	12
Unit III	Meteorological Instruments: - Introduction and their uses: Maximum and minimum Thermometer, - Dry and Wet Bulb Thermometer, Fortin's Barometer, - Aneroid Barometer, Rain Gauge, Wind Vane, Anemometer.	12
Unit IV	Weather Data Collection - Classification of Indian Meteorological Observatories - methods of collection of weather data.	12
Unit V	Weather Maps: - Preparation of weather maps in India; Symbols used in weather maps; - Interpretation of Indian daily weather maps (July, October and January).	12

Essential Readings:

1. Singh L. R. **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad, 2016.
2. Sarkar, A. **Practical geography: A systematic approach**. Orient Black Swan Private Ltd., New Delhi, 2015.
3. Singh Gopal. **Map Work and Practical Geography**. Vikas Publishing, New Delhi. 2012
4. Misra, R.P. & A. Ramesh : **Fundamentals of Cartography**. Concept, New Delhi. 1989.
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Suggested Readings:

1. Robinson, A.H. , et. al.: **Elements of Cartography**. 6th ed. John Wiley, New York, 1995.
2. Singh, R.L.: **Elements of Practical Geography**. Kalyani, New Delhi. 1991.
3. Monkhouse, F.J. : **Maps and Diagrammes**. Methuen, London. 1982.
4. Raisz, E. **General Cartography**. John Wiley and Sons, New York. 5th edition, 1962.
5. flag] vkj- ,y- % izk;ksfxd Hkwxsy ds ewyrRo] dY;k.kh] ubZ fnYyh. 1991.

GOG -MDM-411 – Population Geography of India

Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L6 Sem IV	GOG-MDM-411	Population Geography of India	L	T	P	C	IA (Mid)-40 EA (End Sem)- 60	Dr. R. B. Anuragi Dr. Hemant Patidar
			60	0	0	4		

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the processes and patterns of human population in India through spatial analysis of human population and its environmental consequences.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the basic concepts of population geography;
2. Appreciate the growth, distribution and composition of population in different parts of India;
3. Understand the growth of population in India and its socio-spatial impacts..
4. Understand the problem of growing population, related issues and planning in the country.

3. Unit wise Learning Outcomes:

- UO 1. Learn about the nature and scope of population geography of India.
- UO 2. Know about the distribution, density and growth of human population.
- UO 3. Understand the composition and characteristics of population in India.
- UO 4. Know population dynamics in India.
- UO 5. Learn the population problems and policies.

Unit	Content	Lecture/ Period
Unit I	Introduction to Population Geography in India • Development of Population Geography in India; • Sources of population data: primary and secondary sources- Census of India, Sample Registration, Sample Surveys, etc.	12
Unit II	Distribution and Density of Population • Population distribution and density, Regional pattern and their determinants; • Trends in the Growth of population, causes and consequences and Regional pattern.	12
Unit III	Population Composition • Age and Sex structure; population aging; • Literacy and education; Occupational structure; dependency ratio; • Rural and urban population and trends in urbanization.	12
Unit IV	Population Dynamics: • Measurements and patterns of fertility and mortality; • Internal Migration, Demographic Transition in India.	12
Unit V	Population Problems and Policies • Population problems and prospects in India; • Population policies, population and development	12

Essential Readings:

1. Chandna, R.C. Population Geography. Kalyani Publisher, New Delhi. 2016.
2. Roy, R. A Handbook of Population Geography. Anmol Publication , New Delhi. 2013.
3. Hussain A. Population geography, Vishwabharti Publication. New Delhi. 2013.
4. Kulkarni, K. C. Population and Settlement Geography. Pacific Publication, Delhi, 2012.
5. Clark, J.I. Population Geography. Pergamon Press, Oxford, 1973
6. pkWnuk] vkj lh tula[;k Hkwxsy] dY;k.kh ifCy'klZ u;h fnYyh] 2015

Suggested Readings:

1. Agrawal, K. Population Ecology, Pacific Publication, Delhi, 2010.
2. Dyson, Tim. Population and Development: The Demographic Transition. Zed Books, London. 2010.
3. Srinivasan, K.: Basic Demographic Techniques and Applications, Sage Publications, Delhi, 1998.
4. Daugherty, H.G.,Kenneth C.W.Kammeyir: An Introduction to Population. The Guilford Press, New York, 1998
5. Crooch, Nigel: Principles of Population and Development. Pergamon, New York, 1997.
6. Mishra, R.P. Demographic Upsurge. Book Centre, New Delhi, 1995.
7. Sundaram, K.V. and Sudesh Nagia (ed.): Population Geography. Heritage Publications, Delhi, 1986.
8. Woods, R.: Population Analysis in Geography. Longman, London. 1979.
9. United Nations: Determinants and Consequences of Population Trends. New York, 1973.
10. Garnier, B.J.: Geography of Population. Longman London, 1970.
11. Trewartha, G.T.: Geography of Population: World Patterns, Pergamon Press, New York, 1969.
12. Bogue, D.J.: Principles of Demography. John Wiley, New York, 1969.
13. Zelinsley, Wilbur: A Prologue to Population Geography. Prentice Hall, 1966.
14. Boserup, E. The Conditions of Agricultural Growth. George. Allen & Unwin, London, 1965.
15. Barclay, G.W. Techniques of Population Analysis. John Wiley, New York, 1959.
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GOG – AEC 411- Indian Clinometer

Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L6 Sem IV	GOG AEC-411	Indian Clinometer	L 60	T 0	P 0	C 4	IA (Mid)-40 EA (End Sem)-60	Dr. Satheesh C Dr. Rakesh Saini

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students surveying the relative elevations

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the components of Indian Clinometer surveying;
2. Equipped with mapping of relative elevation.

3. Unit wise Learning Outcomes:

- UO 1. Know about the different dimensions of surveying and geometrics.
 UO 2. Learn about the basics of representing relative elevations in a map.
 UO 3. Understand the major ways of represent the elevation unknown locations.
 UO 4. Understand the major manufacturing processes in the world
 UO 5. Learn about means of transportation in the world.

Unit	Content	Lecture/Period
Unit I	Surveying: • Definition; Principles; • Types of surveying- Geodetic, Plane, Triangulation and Transverse.	12
Unit II	Surveying and Geometry: • Altitude and Distance; Methods of levelling; • Collimation method • Types of Clinometer	12
Unit III	Indian Clinometer: • Introducing Indian clinometer • Parts of Indian Clinometer	12
Unit IV	Methods of Indian Clinometer Surveying: • Distance known; Distance unknown • Mathematical solutions	12
Unit V	Field Work: • Relative Altitudes • Contouring with Indian Clinometer	12

Essential Readings:

Singh L. R. **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad, 2016.
 Sarkar, A. **Practical geography: A systematic approach**. Orient Black Swan Private Ltd., New Delhi, 2015.
 Singh Gopal. **Map Work and Practical Geography**. Vikas Publishing, New Delhi. 2012
 Misra, R.P. & A. Ramesh : **Fundamentals of Cartography**. Concept, New Delhi. 1989.
 'kekZ] ts-ih- % izk;ksfxd Hkwxksy] jLrksxh] esjB] 2016-

Suggested Readings:

Robinson, A.H. , et. al.: **Elements of Cartography**. 6th ed. John Wiley, New York, 1995.
 Singh, R.L.: **Elements of Practical Geography**. Kalyani, New Delhi. 1991.
 Monkhouse, F.J. : **Maps and Diagrammes**. Methuen, London. 1982.
 Raisz, E. **General Cartography**. John Wiley and Sons, New York. 5th edition, 1962.

GOG SEC- 411- Introduction to Remote Sensing

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L6 Sem IV	GOG -SEC-411	Introduction to Remote Sensing	L 60	T 0	P 0	C 4	IA (Mid)-40 EA (End Sem)-60	Dr. Rakesh Saini Dr. Parvendra Kumar

Lectures/Hrs. 60

1. Learning Objectives:

The purpose of the course is to introduce students the basics of remote sensing aerial photography and its interpretation

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of arial and satellite remote sensing;
2. Fill with the skills of utilizing remote sensing data

3. Unit wise Learning Outcomes:

UO 1. Know about the different types of remote sensing.

UO 2. Learn about the areal remote sensing.

UO 3. Understand the interpretation of spatial features from remote sensing data.

Unit	Content	Lecture/Period
Unit I	Remote Sensing: • Definition, types and platforms; Development in the world and India, • Relevance of remote sensing data in geographical studies	12
Unit II	Satellite Remote Sensing: • Principles, EMR Interaction with Atmosphere and Earth Surface; • Satellites (Landsat and IRS) and Sensors	12
Unit III	Mapping and Interpretation • Interpretation skills of remote sensing data • Application of remote Sensing: Land use/ Land Cover studies.	12
Unit IV	Aerial Photography: • Types of photographs, marginal information on aerial photographs; • Simple geometry of conventional vertical aerial photographs.	12
Unit V	Global Positioning System • Introduction to GPS • GPS segments; Source of errors • Application of GPS in geographical studies	12

Essential Readings:

Singh L. R. **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad, 2016.
 Sarkar, A. **Practical geography: A systematic approach**. Orient Black Swan Private Ltd., New Delhi, 2015.
 Singh Gopal. **Map Work and Practical Geography**. Vikas Publishing, New Delhi. 2012
 Misra, R.P. & A. Ramesh : **Fundamentals of Cartography**. Concept, New Delhi. 1989.
 'kekZ] ts-ih- % izk;ksfxd Hkwxksy] jLrksxh] esjB] 2016-

Suggested Readings:

Robinson, A.H. , et. al.: **Elements of Cartography**. 6th ed. John Wiley, New York, 1995.
 Singh, R.L.: **Elements of Practical Geography**. Kalyani, New Delhi. 1991.
 Monkhouse, F.J. : **Maps and Diagrammes**. Methuen, London. 1982.
 Raisz, E. **General Cartography**. John Wiley and Sons, New York. 5th edition, 1962.
 flag] vkj- ,y- % izk;ksfxd Hkwxksy ds ewyrRo] dY;k.kh] ubZ fnYyh. 1991.

Level: 7
Semester: V

GOG DSM- 511- Environment and Resources								
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L7 Sem V	GOG - DSM-511	Environment and Resources	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Prof. Vinod K Bhardwaj Dr. Parvendra Kumar
			4	0	0	4		

Lectures/Hrs. 60

1. Learning Objectives:

Purpose of this paper is to make students conversant with the nature and distribution of resources. Further the paper aims to ensure the communication of sustainable use of resources to the students.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of natural and cultural resources.
2. Course will communicate the ways for establishing a sustainable environmental management.

3. Unit wise Learning Outcomes:

- UO 1. Introduces the fundamentals of ecosystem.
- UO 2. Learn about the physical resource base.
- UO 3. Understand the importance of human resource base.
- UO 4. Make aware of environmental disasters.
- UO 5. Basic idea of environmental impact assessment.

Unit	Content	Lecture/Period
Unit I	Environment • Meaning, definition and components; Ecosystem: types and functioning • Classification of resources - renewable and non-renewable, biotic and abiotic resources • Resources and environment interfaces	12
Unit II	Resources • Minerals and energy resources; water, forests and soils resources-their economic • Environmental significance and conservation methods.	12
Unit III	Human resource • Size, distribution and density; • Population explosion, Population • Pressure and resources utilization, Food security.	12
Unit IV	Environmental disasters and pollutions • Types, causes and related problems; • Emerging environmental problems: Global warming, climatic change.	12
Unit V	Impact of human activities on environment • Deforestation, excessive mining, intensive agriculture and industrialization on environment • Environmental conservation and management • Sustainable resource use.	12

Essential Readings:

Singh, S. **Environmental Geography**. Prawalika Publication, Allahabad, 2016.
Barucha, Arach. **Textbook of Environmental Studies**, University Press India, Hyderabad. 2016.
Siddhartha, K. **Ecology and Environment**. Kishalaya Publication Pvt. Ltd. New Delhi. 2015.
Saxena, H. M. **Environmental Geography**. Rawat Publications. Jaipur, 1999.
Roy, P. K. **Resource Studies**. New Central Book Agency, Calcutta, 2006.
सविन्द्र सिंह पर्यावरण भूगोल प्रयाग पुस्तक सदन इलाहाबाद, 2015

Suggested Readings:

Gautam, A. **Geography of resources: Exploitation, conservation and management**. Sharda Pustak Bhawan, Allahabad, 2013.
Sharma, B.L. & Puar P. **Global Environmental Challenges**. Rohini Books, Publishers & Distributors, Jaipur, 2004.
Saxena, H. M. **Environmental Management**. Rawat Publications, Jaipur, 2000.
Goudie, Andrew. **The Human Impact on the Natural Environment**. Blackwell Oxford, 1994.
Mukerji, A. and V.K. Agnihotri. **Environment and Development**. Concept, New Delhi, 1993.
Smith, R. L. **Man and his Environment: An Ecosystem Approach**. Harper & Row, London, 1992.
Singh, K.N. and D.N. Singh. **Population Growth, Environment and Development: Issues, Impacts and Responses**. Environment & Development Study Centre Varanasi, 1991.
Detwyler, J.R. **Man's Impact on Environment**. Pelican, 1970.
U.N.E.P.: **Global Environmental Outlook**. U.N. Pub. New York. Online
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रघुवंशी अरुण और चन्द्रलेखा रघुवंशी पर्यावरण तथा प्रदूषण मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल, 1989

GOG DSM- 512- Map Projection and Surveying (Practical)								
Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L7 Sem V	GOG - DSM-512	Map Projection and Surveying (Practical)	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. R B Anuragi Dr. Hemant Patidar
			0	0	2	2		

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce students the basic principles, types and applications of map projection, and the basic concepts, principles and applications of Plane Table Surveying.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of map projection techniques.
2. Learn the techniques of plane table surveying and their applications.

3. Unit wise Learning Outcomes:

- UO 1. Learn the definitions, basic concepts and types of map projection.
 UO 2. Understand the basic concepts and uses of Zenithal Projection.
 UO 3. Understand the basic concepts and uses of Conical Projection.
 UO 4. Understand the basic concepts and uses of Cylindrical Projection.
 UO 5. Learn the basic principles and techniques of plane table surveying.

Unit	Content	Lecture/Period
Unit I	Properties of the maps and globe • Map Projection: General principles • classification of Projections: Construction, Properties,	06
Unit II	Zenithal projections • Gnomonic, Stereographic and Orthographic (Polar cases)- characteristics and their uses.	06
Unit III	Conical projections • One standard parallel, Two standard parallels, Bonne's • Polyconic projection- characteristics and their uses.	06
Unit IV	Cylindrical projections • Simple cylindrical, Equal area cylindrical- characteristics and uses.	06
Unit V	Surveying • Plane Table survey by intersection and Resection methods	06

Essential Readings:

Singh L. R. **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad, 2016.
 Sarkar, A. **Practical geography: A systematic approach**. Orient Black Swan Private Ltd., New Delhi, 2015.
 Singh Gopal. **Map Work and Practical Geography**. Vikas Publishing, New Delhi. 2012
 Singh, R.L. **Elements of Practical Geography**. Kalyani, New Delhi. 1991.
 शर्मा, जे.पी. : प्रायोगिक भूगोल, रस्तोगी, मेरठ, 2016

मिश्रा आर. एन. एवं शर्मा पी. के.: प्रायोगिक भूगोल, रावत पब्लिकेशन जयपुर 2019

Suggested Readings:

Robinson, A.H. et. al.: **Elements of Cartography**. 6th ed. John Wiley, New York, 1995.
 Misra, R.P. & A. Ramesh. **Fundamentals of Cartography**. Concept, New Delhi. 1989.
 Monkhouse, F.J. **Maps and Diagrammes**. Methuen, London. 1982.
 Raisz, E. **General Cartography**. John Wiley and Sons, New York. 5th edition, 1962.
 सिंह, आर. एल. : प्रायोगिक भूगोल के मूलतत्व, कल्याणी, नई दिल्ली 1991

GOG AEC- 511- Disaster Risk Reduction								
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L7 Sem V	GOG - AEC- 511	Disaster Risk Reduction	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Prof. Vinod K Bhardwaj Dr. R B Anuragi
			2	0	0	2		

Lectures/Hrs. 3 0

1. Learning Objectives: After completion of this paper, students are able to understand about the disaster-related physical risk and social harms.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of environmental hazards.
2. Fill with the skills of disaster risk reduction

3. Unit wise Learning Outcomes:

- UO 1. Students will be aware of risk, disaster, and hazards.
 UO 2. Make the students to know about the different types and causes of hazards
 UO 3. Students will be conversant with disaster-occurring zones in India.
 UO 4. Awareness about the preventive measures of various types of hazards.
 UO 5. Provide better policy outlook about disaster and hazards management agencies in India.

Unit	Content	Lecture/Period
Unit I	Environmental Hazards • Risk, Vulnerability and Disasters: Definition and Concepts • Types of Environmental Hazards.	06
Unit II	Types of Hazards • Flood, Landslide, Drought, Earthquake, Tsunami and Cyclone; • Man-induced hazards - Technological disasters • Armed conflicts and Civil Unrest.	06
Unit III	Disasters in India • Causes Impact, Distribution and Mapping: Flood and Drought, • Earthquake and Cyclone.	06
Unit IV	Disaster Risk Reduction • Mitigation and Preparedness; Disaster Risk Reduction Strategies, • Disaster Cycle, Phases of Disaster, Preparedness Plans, Action Plans and Procedures.	06
Unit V	Models in disaster preparedness • Components of Disaster Relief: Water, food, sanitation, shelter, • Health and Waste Management; NDMA and NIDM; • Community-Based Disaster Management; Do's and Don'ts during Disasters.	06

Essential Readings:

Singh, S. **Environmental Geography**. Prawalika Publication, Allahabad, 2016.
 Barucha, Arach. **Textbook of Environmental Studies**, University Press India, Hyderabad. 2016.
 Siddhartha, K. **Ecology and Environment**. Kisalaya Publication Pvt. Ltd. Newdelhi. 2015.
 Thakur, D. K. **A Text Book of Environment Disaster Management**. Manisha Prakashan. Jaipur. 2014.
 Singh, R.B., **Risk Assessment and Vulnerability Analysis**, IGNOU, New Delhi, Chapter 1, 2 & 3, 2005.
 Sinha, A., **Disaster Management- Lessons Drawn and Strategies for Future**, New United Press, New Delhi, 2001.
 मिश्र, शिवगोपाल आपदा प्रबन्धन, सत्साहित्य प्रकाशन, दिल्ली, 2013

Suggested Readings:

- Kapur, A., ***Vulnerable India: A Geographical Study of Disasters***, Sage Publication, New Delhi., 2010.
- Modh, S., ***Managing Natural Disaster: Hydrological, Marine and Geological Disasters***, Macmillan, Delhi, 2010.
- Singh, R. B. (ed.), ***Natural Hazards and Disaster Management: Vulnerability and Mitigation***, Rawat Publications, New Delhi, 2006.
- Stoltman, J.P. et al., ***International Perspectives on Natural Disasters***, Kluwer Academic Publications, Dordrecht, 2004.
- Government of India, ***Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council***, Ministry of Urban Development, Government of India, 1997.
- मिश्रा, महेन्द्र कुमार, आपदा प्रबंधन तकनीकी एवं प्रकृति, चतुर्वेदी प्रकाशन, जयपुर, 2013

GOG SEC- 511- Introduction to GIS & GPS								
Level& Semester	CourseCode	Title of theCourse	Credits				Marks	Course Coordinator
L7 Sem V	GOG - SEC-511	Introduction to GIS & GPS	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. Parvendra Kumar
			2	0	0	2		

Lectures/Hrs. 30

1. Learning Objectives: After completion of this paper, students will be able to understand the basic of GIS and GPS along with DBMS

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of arial and satellite remote sensing;
2. Fill with the skills of utilizing remote sensing data

3. Unit wise Learning Outcomes:

- UO 1. Basic understanding of GIS and Remote sensing
- UO 2. Learn about the GIS and Mapping
- UO 3. Understand the integration of remote sensing data with GIS.
- UO 4. Provide a better knowledge on DBMS and GPS
- UO 5. Capable of drawing projects with the help of geo-informatic tools.

Unit	Content	Lecture/Period
Unit I	- Geographical Information System (GIS): Definition, scope and specific characteristics; development in the world and in India - Relation of GIS with other collateral subjects like Cartography, Remote Sensing, Computer Science and Geography.	06
Unit II	- Basic concepts and essential elements of GIS – Map concepts; - Data types involved in GIS; types of data structures, their characteristics, and merits-demerits - Components of GIS. Methods of inputting data in GIS.	06
Unit III	- GIS softwares: paid and open. Integration of remote sensing data with GIS; - Digital terrain modeling and its application in GIS; Spatial analysis in GIS.	06
Unit IV	- Generation Date Base Management System (DBMS), shapefile; point, line, polygon. Geo-referencing and preparation of maps. - Components of GPS; Data Extraction from GPS to GIS and mapping	06
Unit V	Prepare a project report as assigned by the course coordinator	06

Essential Readings:

Lillesand, Thomas M. **Remote Sensing and Image Interpretation**. Wiley India, New Delhi. 2016.
Michael, N. Demers. **Fundamentals of Geographic Information System**, Wiley India. New Delhi. 2015.
Nag, P., **Introduction to GIS**, Concept India, New Delhi, 2008.
Lo C.P. & Yeung A.K.W., **An Introduction to GIS**, P.H.I/Pearson Edu., Asia, 2002
Haywood I., Cornelius I. & Carver S., **An introduction to GIS**, Longman/Pearson Education Asia, 1998/2000.
Martin D. **GIS and their Socio-economic Applications**, Routledge, 2nd ed., 1997.
Goutam, N.C., **Fundamentals of GIS**, Pink Pubs. 1993.
चौनियाल, देवी दत्त: **सुदूर संवेदन एवं भौगोलिक सूचना-प्रणाली**, शारदा पुस्तक भवन इलाहाबाद 2010

Suggested Readings:

Joseph George. **Fundamentals of Remote Sensing**, Universities Press. India. 2016.
Schowengerdt, R. A. **Remote Sensing: Models and Methods for Image Processing**. Elsevier, Amsterdam. 2013.
Jha, M.M. and Singh, R.B., **Land Use: Reflection on Spatial Informatics Agriculture and Development**, Concept, New Delhi, 2008.
Heywoods, I., Cornelius, S and Carver, S., **An Introduction to Geographical Infromation system**. Prentice Hall, 2006.
Kraak M.J. & Ormeling F., **Cartography: visualization of Geo-spatial Data**, Pearson Education Asia., 2nd Ed., 2004.
Agarwal N.K., **Essentials of GPS**, Spatial Networks, 2004.
Burrough P.A. & McDonnell R.A., **Principles of GIS for Land Resource Assessment**, OUP, 2nd ed. 1998.
Chrisman N., **Exploring Geographic Information Systems**, Wiley, 1997.
Geodetic Survey Division, **GPS Positioning Guide**, Govt. of Canada, 1995.
Singh, R.B. and Murai, S., **Space Informatics for Sustainable Development**, Oxford and IBH, New Delhi, 1998.
ओझा, एम. के. **फोटोग्रामिति एवं सुदूर संवेदन**, मास्टर माइंड प्रिंटिंग वर्ल्ड, इन्दौर, 2001.

GOG MDM- 511- Geography of Tourism								
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L7 Sem V	GOG - MDM-511	Geography of Tourism	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. R B Anuragi
			6	0	0	6		

Lectures/Hrs. 90

1. Learning Objectives: In this course, the students will be introduced with the meaning, concept, and typology of tourism. After completing this course, the students will be well known about the importance, impacts, and benefits of tourism in any country, its benefits for the generation of economy, employment, and the importance of conserving natural and cultural phenomenon of conservation landscape.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Introduces the importance of tourism for economy.
2. Fill with the skills of developing tourism potentials at micro level.

3. Unit wise Learning Outcomes:

- UO 1. Deliver the basic concept of tourism.
- UO 2. Introduces the typology of tourism and its importance.
- UO 3. This unit will help to understand sustainable development with its development.
- UO 4. In this unit, the students will be able to know the various impacts of tourism on society and society on tourism.
- UO 5. With this unit, the students will be acquainted with regional study of tourism.

Unit	Content	Lecture/Period
Unit I	Tourism • Concepts, Nature, Scope and Importance; Inter-Relationships of Tourism, Recreation and Leisure; • Determinants of tourism; Geographical Parameters of Tourism by Robinson; Recent Trends of Tourism.	18
Unit II	Type of Tourism • Nature Tourism, Cultural Tourism, Medical Tourism and Pilgrimage; • Classification of tourism based on nationality- national and international.	18
Unit III	Eco- Tourism • concept, types and importance; Sustainable Tourism: • concept and importance; Meetings, Incentives, Conventions and Exhibitions (MICE) in tourism	18
Unit IV	Impact of Tourism on Society • Culture, Economy and Environment; Tourism and national development.	18
Unit V	Tourism in India • Tourism Infrastructure; Case Studies of Himalaya, Desert, Coastal and Heritage; • National Tourism Policy; Tourism in Madhya Pradesh /Bundelkhnad.	18

Essential Readings:

- Khan, M. Y. **Tourism Geography**. Wisdom Press. New Delhi. 2016.
- Krisnan, K. karma & Mohinder Chand **Basic of Tourism – Theory, operation and Practices**. Kanishka Pub. New Delhi 2015
- Bhatia, A.K. **International Tourism Management**, Sterling Pub. (p) Ltd. New Delhi, 2014
- Hall, M. and Stephen, P., **Geography of Tourism and Recreation –Environment, Place and Space**, Routledge, London, 2006.
- जेशी अतुल, महिमा एवं अमित कुमार भारत में आधुनिक पर्यटन, रावत पब्लिकेशन, जयपुर, 2010

Suggested Readings:

Singh Jagbir, **Eco-Tourism**, Published by - I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, 2014. (www.ikbooks.com).

Page, S. J. **Tourism Management: An Introduction**, Butterworth- Heinemann- USA. Chapter 2, 2011.

Kamra, K. K. and Chand, M. **Basics of Tourism: Theory, Operation and Practise**, Kanishka Publishers, Pune, 2007.

Raj, R. and Nigel, D., **Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective** by, CABI, Cambridge, 2007. www.cabi.org.

Dhar, P.N., **International Tourism: Emerging Challenges and Future, Prospects**. Kanishka, New Delhi, 2006.

खत्री, हरीश कुमार, पर्यटन भूगोल, कैलाश पुस्तक सदन, भोपाल, 2011

Level: 7
Semester: VI

GOG DSM- 611- Geography of India								
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L7 Sem VI	GOG - DSM-611	Geography of India	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Dr. R B Anuragi Dr. Satheesh C.
			4	0	0	4		

Lectures/Hrs. 60

1. Learning Objectives:

After completion of this paper student will be acquainted with physiographic and climatic configuration of India. Further student will be communicated with resource structure and the regional distribution pattern of India.

2. Course Learning Outcomes: After the completion of this course, student will have the ability to:

1. Understand the fundamentals of physiographic and climatic complexities of India.
2. The use of resource base and productivity for the welfare and well-being of the society.

3. Unit wise Learning Outcomes:

- UO 1. Know about the physical characteristics of India.
 UO 2. Introduce the nature of demographic structure of India.
 UO 3. Provide a better understanding on the physical resource of the country.
 UO 4. Introduce with the agrarian background of Indian economy.
 UO 5. Better understanding of manufacturing in India and its international trade.

Unit	Content	Lecture/Period
Unit I	Physical setting • Locational characteristics, Geology, Physiographic divisions; Drainage system • Climate: Origin of monsoon, Climatic regions in India; • Soils: types, characteristic and distribution • Vegetation: types and distribution.	12
Unit II	Population • Size, Growth, Distribution and Density; Population • Characteristics: literacy, sex ratio • Trends of Urbanization in India.	12
Unit III	Resource Base • Minerals –Iron ore, Manganese, Bauxite and Copper; Power resources- Coal, Petroleum, • Hydroelectric power; non-conventional sources of energy.	12
Unit IV	Agriculture • Major crops- wheat, rice, sugarcane, cotton and tea –their distribution, • production and trade; Impacts of Green revolution on Indian agriculture; Agricultural regions in India.	12
Unit V	Industries • Iron and Steel, Cement, Cotton textile and Sugar –locational factors, distribution and production; • International trade; Globalization and Economic Development.	12

Essential Readings:

Khullar, D.r. **India: A Comprehensive study** kalyani pub., Luchiana, New Delhi, 2016.
Tiwari, R.C., **Geography of India**. Allahabad: Pravalika Publication. Allahabad, 2016.
Singh Gopal. A Geography of India. Atmaram and Sons, New Delhi. 2010.

Husain, Majid, **Geography of India**, McGraw-Hill Com. New Delhi, 2008.

तिवारी आर. सी. **भारत का भूगोल**, इलाहाबाद: प्रयाग पुस्तक भवन, 2016

गौतम, अलका, **भारत का बृहद् भूगोल**, भारदा पुस्तक भवन, इलाहाबाद, 2015

Suggested Readings:

Basham, A. L. **The Wonder that was India**. Picador, London. 2004.

Das, P.K., **The Monsoon**. National Book Trust of India, New Delhi. 2002.

Sharma, T.C. & Coutinho O., **Economic and Commercial Geography of India**, Vikash Publication, New Delhi. 1998.

Singh, R. L., ed., **India- A Regional Geography**. N. G. S. India, Varanasi, 1971.

बंसल, सुरेश चंद : **भारत का वृहद् भूगोल**, मीनाक्षी प्रकाशन, मेरठ 2015

चौहान पी. आर. **भारत का बृहद् भूगोल**, वसुन्धरा प्रकाशन, गोरखपुर, 2013

शर्मा, श्रीकमल, सम्पादक: **भारत का भूगोल**, म.प्र. हिन्दी ग्रंथ अकादमी भोपाल, 2013

सिंह, जगदीश : **भारत—भौगोलिक आधार एवं आयाम**, ज्ञानोदय प्रकाशन गोरखपुर, 2003.

अग्रवाल, पी.सी. **भारत का भौतिक भूगोल**, एशिया प्रकाशन कम्पनी रायपुर 2003—04

GOG DSM- 612- Quantitative Techniques in Geography (Practical)								
Level& Semester	Course Code	Title of theCourse	Credits				Marks	Course Coordinator
L7 Sem VI	GOG - DSM-612	Quantitative Techniques in Geography (Practical)	L 0	T 0	P 2	C 2	IA (Mid)-40 EA (End Sem)-60	Dr. Hemant Patidar

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce students the statistical techniques used in geography and allied disciplines and also to train students about the field survey techniques.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of statistical techniques and its application in geographical studies.
2. Learn the field survey techniques.

3. Unit wise Learning Outcomes:

- UO 1. Know the sources of data, learn the basic of tabulations and classification of data.
 UO 2. Learn measures of central tendency and their uses.
 UO 3. Learn measures of dispersion and their uses.
 UO 4. Learn methods of correlation analysis and uses.
 UO 5. Learn the field survey techniques and prepare a field survey based project report.

Unit	Content	Lecture/Period
Unit I	Sources of Data • Tabulation and Classification of Data; Frequency Distribution, Histogram, • Frequency Polygon and Ogive Curve.	06
Unit II	Measures of Central Tendency • Mean, Median and Mode	06
Unit III	Measures of dispersion • Range, Quartiles • Mean Deviation and Standard Deviation.	06
Unit IV	Correlation • Karl Pearson and Spearman's rank correlation coefficient.	06
Unit V	Project report • One day field excursion of any specific geographical unit-village/ward • Geomorphic site and its survey based project report.	06

Essential Readings:

Mahmood Aslam. **Statistical Methods in Geographical Studies**, Rajesh Publication. New Delhi. 2016.
 Singh L. R. **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad, 2016.
 Sarkar, A. **Practical geography: A systematic approach**. Orient Black Swan Private Ltd., New Delhi, 2015.
 Singh Gopal. **Map Work and Practical Geography**. Vikas Publishing, New Delhi. 2012
 Gupta, S.P. **Advanced Practical Statistics**, Sultan Chand and Company, New Delhi. 1998.
 Zamir, A. **Statistical Geography: Methods and Applications**, Rawat Publications, Jaipur. 2003.
 Mahmood, A. **Statistical Methods in Geographical Studies**, Rajesh Publications, New Delhi. 1986.

शर्मा, जे.पी. **प्रायोगिक भूगोल**, रस्तोगी, मेरठ, 2016.

मिश्रा आर. एन. एवं शर्मा पी. के.: **प्रायोगिक भूगोल**, रावत पब्लिकेशन जयपुर 2019

Suggested Readings:

Bhagwathi, V. and Pillai, R.S.N. **Practical Statistics**, Sultan Chand and Company, New Delhi. 2003.

Robinson, A.H. et. al.: **Elements of Cartography**. 6th ed. John Wiley, New York, 1995.

Singh, R.L. **Elements of Practical Geography**. Kalyani, New Delhi. 1991.

Misra, R.P. & A. Ramesh. **Fundamentals of Cartography**. Concept, New Delhi. 1989.

Monkhouse, F.J. **Maps and Diagrammes**. Methuen, London. 1982.

Ebdon, D. **Statistics in Geography: A Practical Approach**, Blackwell Publishers Inc., Massachusetts. 1977.

Gregory, S. **Statistical Methods and the Geographer**, Longman, London. 1973.

Raisz, E. **General Cartography**. John Wiley and Sons, New York. 5th edition, 1962.

सिंह, आर. एल. **प्रायोगिक भूगोल के मूलतत्त्व**, कल्याणी, नई दिल्ली 2015.

GOG AEC- 611- Sustainability and Development								
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L7 Sem VI	GOG - AEC- 611	Sustainabilit y and Development	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Prof. Vinod K Bhardwaj
			2	0	0	2		

Lectures/Hrs. 30

1. Learning Objectives: Introduce the students the importance of sustainable development strategies for the future of the society.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of sustainability and development.
2. Introduced with state policies s and programmes for sustainable development.

3. Unit wise Learning Outcomes:

- UO 1. Introduce with the basic concept of sustainability and development.
- UO 2. Learn about the national and international strategies of development.
- UO 3. Better understanding on human resource base.
- UO 4. Aware about the role of climate change on sustainable development.
- UO 5. Introduced with financing sustainable development.

Unit	Content	Lecture/Period
Unit I	Sustainability • Definition, Components and Sustainability for Development; • Sustainable development: meaning, concept and Need and examples from different Ecosystems.	06
Unit II	The Millennium Development Goals • National Strategies and International Experiences.	06
Unit III	Inclusive Development • Education, Health; The role of higher education in sustainability; • The human right to health; Poverty and disease.	06
Unit IV	Sustainable Livelihood Model • Policies and Global Cooperation for Climate Change; • Sustainable Development Policies and Programmes: Rio+20.	06
Unit V	Goal-Based Development • Financing for Sustainable Development; Principles of Good Governance; • National Environmental Policy, CDM.	06

Essential Readings:

Sharma, P. D. **Ecology and Environment**. Rastogi Publication. Meerut. 2016.
 Fulekar, M.H. et al. **Environment and Sustainable Development**. Springer India, 2014.
 Robbins, Paul **Political Ecology: A Critical Introduction**. Blackwell Publishing, 2004.
 सविन्द्र सिंह पर्यावरण भूगोल प्रयाग पुस्तक सदन इलाहाबाद, 2015

Suggested Readings:

Martínez-Alier, Joan et. al., **Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm**, Ecological Economics 69: 1741-1747, 2010.
 Ayers, J. and David D., **Climate change adaptation and development I: the state of the debate**. Progress in Development Studies 10 (2): pp. 161-168, 2010.

- Baker, Susan ***Sustainable Development***. Milton Park, Abingdon, Oxon; Routledge, New York, 2006.
- Osorio, Leonardo et al., ***Debates on sustainable development: towards a holistic view of reality***, *Environment, Development and Sustainability* 7: 501-518, 2005.
- Agyeman, Julian, Robert D. Bullard and Bob Evans (Eds.) ***Just Sustainabilities: Development in an Unequal World***. London, 2003.
- Lohman, Larry, ***Re-imagining the population debate***, Corner House Briefing 28, 2003.
- Brosius, Peter, ***Endangered forest, endangered people: Environmentalist representations of indigenous knowledge***, *Human Ecology* 25: 47-69, 1997.
- Merchant, Carolyn (Ed.), ***Ecology. Atlantic Highlands***, N.J: Humanities Press, 1994.

GOG SEC- 611- Field Techniques and Survey

Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L7 Sem VI	GOG - SEC- 611	Field Techniques and Survey	L 2	T 0	P 0	C 2	IA (Mid)-40 EA (End Sem)-60	Dr. Parvendra Kumar

Lectures/Hrs. 30

1. Learning Objectives:

The purpose of the course is to introduce the field survey techniques used in geographical studies and to prepare a field survey-based report.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the fundamentals of field survey techniques their applications in geographical studies.
2. Learn the methods of primary data collection.

3. Unit wise Learning Outcomes:

- UO 1. Understand role, values and ethics in field work.
 UO 2. Learn the merits and techniques of selection of field area.
 UO 3. Learn the methods of primary data.
 UO 4. Learn methods of space survey.
 UO 5. Learn the preparation of a field survey based project report.

Unit	Content	Lecture/Period
Unit I	Field Work in Geographical Studies • Role, Value and Ethics of Field-Work; Defining the Field and • Identifying the Case Study – Rural / Urban / Physical / Human / Environmental.	06
Unit II	Field Techniques • Merits, Demerits and Selection of the Appropriate Technique; observation (Participant / Non Participant).	06
Unit III	Methods of primary data collection • Questionnaires (Open/ Closed / Structured / Non-Structured); Schedule, Interview.	06
Unit IV	Space Survey • Transects and Quadrants, constructing a Sketch	06
Unit V	Designing the Field Report • Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.	06

Essential Readings:

Kanitkar, T. P. **Surveying and Leveling (Part I & Part II)**, Vidyarthi Griha. Pune. 2016.
 Creswell J. **Research Design: Qualitative and Quantitative Approaches**, Sage Publications, 1994.
 Wolcott, H. **The Art of Fieldwork**. Alta Mira Press, Walnut Creek, CA, 1995.
 Stoddard R. H. **Field Techniques and Research Methods in Geography**, Kendall/Hunt, 1982.
 शर्मा, जे.पी. **प्रायोगिक भूगोल**, रस्तोगी, मेरठ, 2016.
 मिश्रा आर. एन. एवं शर्मा पी. के.: **प्रायोगिक भूगोल**, रावत पब्लिकेशन जयपुर 2019

Suggested Readings:

- Dikshit, R. D. ***The Art and Science of Geography: Integrated Readings***, Prentice-Hall of India, New Delhi, 2003.
- Mukherjee, Neela ***Participatory Learning and Action: with 100 Field Methods***. Concept Publs. Co., New Delhi, 2002.
- Robinson A. ***Thinking Straight and Writing That Way***, in *Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences*, eds. by F. Pryczak and R. Bruce Pryczak Publishing, Los Angeles, 1998.
- Mukherjee, Neela ***Participatory Rural Appraisal: Methodology and Application***, Concept Publs. Co., New Delhi, 1993.
- Evans M. ***Participant Observation: The Researcher as Research Tool*** in *Qualitative Methods in Human Geography*, eds. J. Eyles and D. Smith, Polity, 1988.

GOG MDM- 611- Disaster Management								
Level& Semester	CourseCode	Title of the Course	Credits				Marks	Course Coordinator
L7 Sem VI	GOG - MDM- 611	Disaster Management	L	T	P	C	IA (Mid)-40 EA (End Sem)-60	Prof. Vinod K Bharadwaj
			6	0	0	6		

Lectures/Hrs. 90

1. Learning Objectives: After completion of this paper, will create an understanding among the students about the disaster and their occurrence. The students will also be aware towards the problems associated with the disaster and their management.

2. Course Learning Outcomes: After the completion of the course, the students will have the ability to:

1. Understand the meaning and concept of disaster.
2. To the need of precautions for the environmental disasters.

3. Unit wise Learning Outcomes:

UO1. Introduces the different types of environmental hazards.

UO2. Better understanding on the types and impacts of man-made disasters.

UO 3. Presents the pattern natural disasters in India

UO 4. Introduces the preparedness before and after the occurrence of the disaster.

UO 5. Produces the state policies and programmes concerned with disaster management.

Unit	Content	Lecture/Period
Unit I	Environmental Hazards, • Risks, Vulnerability and Disasters: Meaning, Definitions and Concepts • Types of Environmental Hazards: Natural- Flood, Landslide, Drought, Earthquake, Tsunami and Cyclone.	18
Unit II	Man-induced hazards • Technological disasters, Armed conflicts and Civil Unrest • Human induced disasters: Causes, Types, Impacts, Distribution and Mapping.	18
Unit III	Disasters in India • Causes, Impact, Distribution and Mapping- Flood, Landslide, Drought, Earthquake, Tsunami and Cyclone.	18
Unit IV	Response and Mitigation to Disasters • Mitigation and Preparedness; Psychosocial issues and recovery during emergency situations, Equity issues in disasters, • different stake holders in Disaster Relief; Refugee operations during disasters,	18
Unit V	Disaster Management • National Disaster Management Authority (NDMA) and National Institute of Disaster Management (NIDM) and NDRF: Functions and strategies; • Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During Disasters Relationship between Disasters,	18

Essential Readings:

Singh, S. **Environmental Geography**. Prawalika Publication, Allahabad, 2016.
 Barucha, Arach. **Textbook of Environmental Studies**, University Press India, Hyderabad. 2016.
 Siddhartha, K. **Ecology and Environment**. Kishalay Publication Pvt. Ltd. Newdelhi. 2015.
 Thakur, D. K. **A Text Book of Environment Disaster Management**. Manisha Prakashan. Jaipur. 2014.
 Singh, R.B., **Risk Assessment and Vulnerability Analysis**, IGNOU, New Delhi, Chapter 1, 2 & 3, 2005.
 Sinha, A., **Disaster Management- Lessons Drawn and Strategies for Future**, New United Press, New Delhi, 2001.

मिश्र, शिवगोपाल आपदा प्रबंधन, सत्साहित्य प्रकाशन, दिल्ली, 2013

Suggested Readings:

- Kapur, A., **Vulnerable India: A Geographical Study of Disasters**, Sage Publication, New Delhi., 2010.
- Modh, S., **Managing Natural Disaster: Hydrological, Marine and Geological Disasters**, Macmillan, Delhi, 2010.
- Government of India, **Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council**, Ministry of Urban Development, Government of India, 1997.
- Singh, R. B. (ed.), **Natural Hazards and Disaster Management: Vulnerability and Mitigation**, Rawat Publications, New Delhi, 2006.
- Stoltman, J.P. et al., **International Perspectives on Natural Disasters**, Kluwer Academic Publications, Dordrecht, 2004.
- मिश्रा, महेन्द्र कुमार, आपदा प्रबंधन तकनीकी एवं प्रकृति, चतुर्वेदी प्रकाशन, जयपुर, 2013

Learning Outcomes-based Curriculum Framework for Undergraduate Education (2020), UGC, New Delhi

Qualification descriptors for a Bachelor's Degree programme:

The students who complete one/two/three years of full-time study of an undergraduate programme of study will be awarded a Certificate/Diploma/Bachelor's Degree.

Some of the expected learning outcomes that a student should be able to demonstrate on completion of a Certificate/Diploma/Degree -level programme may include the following:

- Demonstrate:
 - (i) a fundamental/systematic or coherent understanding of an academic field of study, its different learning areas and applications, and its linkages with related disciplinary areas/subjects;
 - (ii) procedural knowledge that creates different types of professionals related to the disciplinary/subject area of study, including research and development, teaching and government and public service;
 - (iii) skills in areas related to one's specialization and current developments in the academic field of study.
- Use knowledge, understanding and skills required for identifying problems and issues, collection of relevant quantitative and/or qualitative data drawing on a wide range of sources, and their application, analysis and evaluation using methodologies as appropriate to the subject(s) for formulating evidence-based solutions and arguments;
- Communicate the results of studies undertaken in an academic field accurately in a range of different contexts using the main concepts, constructs and techniques of the subject(s);
- Meet one's own learning needs, drawing on a range of current research and development work and professional materials;
- Apply one's disciplinary knowledge and transferable skills to new/unfamiliar contexts, rather than replicate curriculum content knowledge, to identify and analyse problems and issues and solve complex problems with well-defined solutions.
- Demonstrate subject-related and transferable skills that are relevant to some of the job trades and employment opportunities.