# LESSON PLAN (2020-2021)

## DEPARTMENT OF GEOGRAPHY

## GEOGRAPHY HONOURS

## 1ST SEMESTER
## JULY-DECEMBER, 2020

### CREDIT DISTRIBUTION ACROSS COURSE FOR FIRST SEMESTER

| COURSE CODE | TITLE | CREDIT | MARKS | ALLOTED CLASSES |
|---|---|---|---|---|
| GEOACOR01T | GEOTECTONICS AND GEOMORPHOLOGY | 4 | 50 | 60 |
| GEOACOR01P | | 2 | 25 | 60 |
| GEOACOR02T | CARTOGRAPHIC TECHNIQUES | 4 | 50 | 60 |
| GEOACOR02P | | 2 | 25 | 60 |

### GEO-TECTONICS AND GEOMORPHOLOGY (GEOACOR01T)

**Course Outcome**

1. Students will be able to distinguish between endogenic and exogenic forces
2. Students will realize the concept of Isostacy based on equilibrium concept. Students will be able to correlate between different types of geomorphic process and resultant landforms as a process response system.
3. Students will be able to identify the landforms as a geoheritge.
4. Students will be able to identify the appropriate landform for certain human activities.
5. Students will be able to interpret the landforms as a tourist guide.

**COURSE COORDINATOR: Dr. Rajat Halder (Rh)**
**Teachers: Dr. Rajat Halder (Rh) And Dr. Madhab Mondal (Mm)**

| GEOACOR01T | | | | |
|---|---|---|---|---|
| **UNIT-1 (GEO-TECTONIC)** | | | | |
| MONTH | HOURS | TEACHER | TOPIC | REMARKS |
| September | 2 | **MM** | Earth's tectonic structure | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 3 | | Structural evolution : concept and process | |
| | 2 | | Geological time scale | |
| October | 6 | | Study of earth's structural evolution in the perspective of geological time scale | |
| | 4 | | Earth's interior structure | |
| | 2 | | Layers of earth's interior in detail | |
| November | 3 | | Seismology: Concept and its association with earth's interior. | |
| December | 4 | | Plate tectonic: Basic concept, characteristics, significance | |
| | 4 | | Classification of plate boundaries and associated landforms | |
| | 2 | | Hotspots and vulcanicity. | |
| | 2 | | **Internal Assessment** | |
| **UNIT-II (GEOMORPHOLOGY)** | | | | |

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|---|---|---|---|---|
| September | 3 | **RH** | Degradational Processes: Concept, causes and significance | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 3 | | Weathering: Concept, Definition, classification and impact of landforms | |
| | 3 | | Mass-wasting: Concept, definition, categorization and impact of landforms | |
| October | 4 | | Development of river network and landforms on folded structure | |
| | 4 | | Glacier: Conceptual framework, classification, erosional and depositional landforms | |
| | 2 | | Glacio-fluvial processes and landforms | |
| November | 4 | | Wind: Conceptual framework, classification, erosional and depositional landforms | |
| | 3 | | Fluvial action: Conceptual framework, classification, erosional and depositional landforms | |
| December | 3 | | Fluvio-aeolian processes and landforms | |
| | 3 | | Cycle of erosion: Davis | |
| | 3 | | Model of landscape evolution: Hack | |
| | 1 | | **Internal Assessment** | |

## GEO-TECTONICS AND GEOMORPHOLOGY LAB (GEOACOR01P)

**Course Outcome:**

1. Students will be able to identify the rocks and minerals.
2. Students will be able to use the rocks and minerals based on their character.
3. From the geological map, the students will able to establish the correlation between the structure and landform
4. Students will be able to identify the appropriate landform for certain human activities and interpret the landforms as a tourist guide.
5. Know about the basic characteristics of rocks and minerals and method of identification

**COURSE COORDINATOR: Dr.Rajat Halder**
**Teachers: Deepika Mondal & Dr.Rajat Halder**

| GEOACOR01P | | | |
|---|---|---|---|
| MONTH | HOURS | TEACHER | TOPIC |
| September | 4 | DM | Megascopic identification: Rocks: Granite, basalt, laterite, sandstone, conglomerate, slate, phyllite, schist, gneiss, marble |
| | 3 | DM | Interpretation of geological maps with unconformity and intrusions on uniclinal structure |
| October | 8 | DM | Interpretation of geological maps with unconformity and intrusions on uniclinal structure |
| December | 4 | RH | Megascopic identification: Minerals: bauxite, calcite, chalcopyrite, galena, hematite, mica, quartz, tourmaline |

## CARTOGRAPHIC TECHNIQUES (GEOACOR02T)

**COURSE OUTCOME**

1. Students will get knowledge about projection, map and map making process.
2. Students will be able to apply the concept of scale according to their character.
3. Achieve hand hold knowledge about the scale, projection construction.
4. Understand about the differences among the scales as well as among the projections and also their applicability.
5. The concept of drainage basin delineation, relative relief, slope map, stream ordering, will help student for drainage basin management

**COURSE COORDINATOR: Dr.Madhab Mondal**
**Teachers: Susmita Halder (Sh), Dr. Aditi Matilal (Am) And Deepika Mondal (Dm)**

| GEOACOR02T | | | | |
|---|---|---|---|---|
| MONTH | HOURS | TEACHER | TOPIC | REMARKS |
| September | 3 | S.H | Maps: Concept and classification | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 3 | | Components of Map | |
| | 3 | | Scale: Concept and application | |
| October | 3 | | Classification of scale | |
| | 3 | | Plain scale | |
| | 3 | | Comparative scale | |
| November | 2 | | Diagonal scale | |
| September | 4 | AM | Survey of India topographical maps: concept, margin information | |
| | 5 | | Reference scheme of old and open series | |
| | 2 | | Coordinate system: concept and classification | |
| October | 3 | | Polar coordinate system | |
| | 3 | | Rectangular coordinate system | |
| | 3 | | Concept of generating globe | |
| | 1 | | **Internal Assessment** | |
| November | 4 | | UTM projection: concept and characteristics | |
| December | 3 | | Map projection: Definition, classification, properties and uses. | |

## CARTOGRAPHIC TECHNIQUES LAB (GEOACOR02P)

**Course Outcome:**

1. Students will get hand hold knowledge about the scale, projection construction.
2. Students will understand about the differences among the scales as well as among the projections

and also their applicability.

3. The concept of drainage basin delineation, relative relief, slope map, stream ordering, will help student for drainage basin management.
4. Know about map making process through different projection.
5. Student will be able to inculcated aesthetic values in them themselves.

**COURSE COORDINATOR: Dr. Aditi Matilal**
**Teachers: SH, AM, DM**

| GEOACOR02P | | | |
|---|---|---|---|
| MONTH | HOURS | TEACHER | TOPIC |
| December | 3 | SH | Graphical construction of Plain scale |
| | 3 | | Graphical construction of Comparative scale |
| | 3 | | Graphical construction of Diagonal scale |
| | 2 | | Practice class |
| | 3 | AM | Polar-zenithal Stereographic Projection: calculation & graphical construction |
| | 3 | | Bonne's cylindrical equal area projection: calculation & graphical construction |
| | 3 | | Mercator's projection: calculation & graphical construction |
| | 1 | | Practice class |
| November | 3 | DM | Delineation of drainage basin from Survey of India topographical map |
| | 3 | | Relative relief map: Calculation, diagrammatic representation & interpretation |
| December | 4 | | Average slope map: Calculation, diagrammatic representation & interpretation |
| | 4 | | Stream ordering (Strahler): Calculation, diagrammatic representation & interpretation |
| | 4 | | Transect Chart: correlation between physical and cultural features from Survey of India topographical maps. |

# 3RD SEMESTER (2020-2021)

# LESSON PLAN

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## DISTRIBUTION OF COURSES IN THIRD SEMESTER HONOURS

| COURSE CODE | COURSE NAME | CREDIT | MARKS | Allotted classes according to syllabus |
|---|---|---|---|---|
| GEOACOR05T | Climatology | 04 | 50 | 60 |
| GEOACOR05P | Climatology(Lab) | 02 | 25 | 60 |
| GEOACOR06T | Geography of India | 06 | 75 | 90 |
| GEOACOR07T | Statistical Methods in Geography | 04 | 50 | 60 |
| GEOACOR07P | Statistical Methods in Geography Lab | 02 | 25 | 60 |

## CLIMATOLOGY (GEOACOR05T)

**Course Outcome:**

1. Students will be able to learn about the elements of atmosphere i.e. nature, composition, insolation, distribution of temperature, green house gas etc.
2. These topic helps the student to understand about the change of climate and they will be able to correlate to their local climatic condition
3. Students will be able to learn about the atmospheric phenomena and also climatic condition such as condensation process, air mass, front, cyclone, monsoon circulation in India.
4. Students will be able to select suitable crop according to the climatic condition.
5. The knowledge about cyclone help in student to take necessary action any cyclonic event as a disaster management.

**COURSE COORDINATOR: Dr.Aditi Matilal**

**Teacher: Dr. Madhab Mondal**

| Month | Hours | Teacher | Topic | REMARKS |
|---|---|---|---|---|
| July | 2 | MM | Nature, composition and layering of the atmosphere | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 1 | | Insolation | |
| August | 2 | | Controlling factors of insolation, Heat budget of the Atmosphere | |
| | 1 | | Temperature :horizontal and vertical distribution | |
| | 1 | | Inversion of temperature: types, causes and consequences | |
| | 2 | | Green house effect and importance of ozone layer | |
| | 1 | | Revision | |
| | 2 | | Condensation: Process and forms, Mechanism of precipitation | |
| | 1 | | Internal assessment | |
| September | 2 | | Bergeron-Findeisentheory,collisionandcoalescence.Formsofprecipitatin | |
| | 1 | | Airmass: Typology, origin, characteristics | |
| | 2 | | Airmass: modification, Fronts: warm and cold | |
| | 1 | | Frontogenesis and Frontolysis | |
| | 2 | | Weather:stability and instability; barotropic and baroclinic conditions | |
| | 1 | | Internal assessment | |
| | 2 | | Circulation in the atmosphere: Planetary winds | |
| | 1 | | Jet stream, index cycle | |
| | 2 | | Mid-latitude cyclone | |

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|---|---|---|---|---|
| | 1 | | Tropical cyclones | |
| October | 2 | | Monsoon circulation | |
| | 1 | | Monsoon circulation and mechanism with reference to India | |
| | 2 | | Monsoon and jet stream | |
| | 1 | | Climatic classification after Köppen | |
| | 2 | | Climatic classification after Thornthwaite(1955) | |
| | 1 | | Climatic classification after Oliver | |
| November | 1 | | Climatology question answer discussion | |

## CLIMATOLOGY (GEOACOR05P)

**Course Outcome:**

1. Students will be able to interpret the weather map of India. These will increase the analytical ability of student
2. Students will be able to learn construct the hythergraph and climograph. Students will be able to correlate between two variables.
3. Student will able to understand about the windrose.
4. Student will be able to inculcated aesthetic values in them themselves.
5. Student will be able to work in a group.

**COURSE COORDINATOR: Dr. Aditi Matilal**

**Teacher: Susmita Halder**

| Month | Hours/Classes | Teacher | Topic | REMARKS |
|---|---|---|---|---|
| August | 2 | SH | Concept of weather map and introduction to symbols of weather map | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 1 | | Introduction to Pre-monsoon weather map | |
| | 2 | | Introduction to monsoon weather map | |
| | 1 | | Introduction to post-monsoon weather map | |
| | 2 | | Conceptofairpressureanditshorizontalandverticaldistributionindifferentphases of monsoon | |
| | 1 | | Pressureprofilepreparationandinterpretationforthree monsoonalphases | |
| September | 2 | | ComparativeIsobarstudyofpre-monsoon,monsoonandpostmonsoon,pressuregradientmap preparation | |
| | 1 | | Tabulation of wind direction from three types of maps | |
| | 2 | | Wind rose diagram, zonal wind distribution for all three seasons | |

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|---|---|---|---|---|
| | 1 | | Preparation of wind velocity map | |
| | 2 | | Relationship between pressure gradient and wind velocity and preparation of profile | |
| | 2 | | Study and representation of sky condition | |
| | 1 | | Study and representation of cloud condition | |
| October | 2 | | Isohyet map preparation | |
| | 1 | | Study of sea condition | |
| | 2 | | Transect chart | |
| | 1 | | Class assessment | |
| November | 1 | | Discussion | |
| | 2 | | Internal assessment | |
| | 1 | | Hythergraph | |
| December | 2 | | Climograph | |
| | 1 | | Practice of hythergraph and climograph | |
| | 2 | | Internal assessment | |
| | 1 | | Revision | |
| | 2 | | Discussion and feedback on preparation of project profile | |

## GEOACOR06T: Geography of India

**Course outcome**

1. Students will be able to know about the distribution of physiographic features, climatic provinces, soil, vegetation, population etc. Students will realize the vastness of India as well as West Bengal and and also realize the unity in diversity.
2. Students will be able to know about the distribution of recourses in India.
3. Students will be able to know about the distribution of recourses in West Bengal
4. Students will be able to realize about the allocation of industry in India and West Bengal.
5. Students will be able to know about the regional disparity of India and they will be able to suggest the proper planning for the less developed part of India.

**COURSE COORDINATOR: Dr. Aditi Matilal**

**Teacher:Dr.Aditi Matilal**

| Month | Teacher | Hours/Classes | Topic | REMARKS |
|---|---|---|---|---|

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|---|---|---|---|---|
| July | AM | 1 | Tectonic provinces of India | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | | 2 | Stratigraphic provinces of India | |
| August | | 1 | Physiographic divisions of India | |
| | | 2 | Physiographic divisions of India | |
| | | 1 | Climate of India: Characteristics and classification | |
| | | 2 | Soil: Characteristics and classification | |
| | | 1 | Vegetation: Characteristics and classification | |
| | | 2 | Population: Distribution, growth, structure and policy | |
| | | 1 | Tribes of India with special reference to Gaddi, | |
| | | 2 | Tribes of India with special reference Toda, Santal and Jarwa | |
| | | 1 | Agricultural regions. Green revolution and its consequences | |
| September | | 2 | Revision | |
| | | 1 | Question answer discussion | |
| | | 2 | Internal Assessment | |
| | | 1 | Power resources distribution coal, petroleum | |
| | | 1 | Natural gas | |
| | | 2 | Mineral utilization: iron ore, | |
| | | 1 | Industrial development: Automobile and information technology | |
| November | | 2 | Question answer discussion | |
| | | 2 | Internal Assessment | |
| December | | 2 | Regionalisation of India: Physiographic(R. L. Singh | |
| | | 1 | Economic regionalization in economic(P. Sengupta) | |
| | | 2 | Internal assessment | |
| | | 1 | Revision | |
| | | 2 | Question answer discussion | |

## GEOCORO7T:STATISTICAL METHODS IN GEOGRAPHY

**COURSE OUTCOME**

1. Students will be able to know about the theoretical concept of statistical data.
2. Students will be able to know about the sources of geographical data for statistical analysis.
3. Students will be able to know about the significances of frequency.
4. Students will be able to know about the cumulative frequency, normal and probability
5. will be able to correlate theses with geography.

**COURSE COORDINATOR: Dr. Rajat Halder Teacher: Dr.Rajat Halder**

| Month | Hours | Teacher | Topic | Remarks |
|---|---|---|---|---|
| JULY | 1 | RH | Concept and definition of statistics | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 1 | | Importance and significance of statistics | |
| AUG | 1 | | Discrete and continuous data: concept and examples | |
| | 1 | | Population and sample | |
| | 1 | | Scale of measurement(interval and ratio) | |
| | 1 | | Scale of measurement(nominal and ordinal) | |
| | 1 | | Sources of geographical data | |
| | 1 | | Use of geographical data for statistical analysis | |
| | 1 | | Method of data collection | |
| | 1 | | Formation of statistical table | |
| | 1 | | Sampling and its concept | |
| | 1 | | Need and types of sampling | |
| | 1 | | Sampling and its classification | |
| | 1 | | Significance and methods of random sampling | |
| | 1 | | Frequency distribution | |
| SEPTEMBER | 1 | | Normal distribution, cumulative frequency | |
| | 1 | | Probability distribution | |
| | 1 | | Revision | |
| | 1 | | Internal assessment of unit-1 | |
| OCTOBER | 1 | | Concept of central tendencies | |
| | 1 | | Mean-concept, definition, uses, advantages and disadvantages | |
| | 1 | | Median-concept, definition ,uses, | |

| | | | | |
|---|---|---|---|---|
| | | | advantages and disadvantages | |
| | 1 | | Mode-concept, definition, uses, advantages and disadvantages | |
| | 1 | | Partition values | |
| | 1 | | Internal assessment | |
| | 1 | | Measures of dispersion: mean deviation, quartile deviation | |
| NOVEMBER | 1 | | Standard deviation-definition, uses | |
| | 1 | | Coefficient of variation-significance | |
| | 1 | | Rank correlation | |
| DECEMBER | 1 | | Product moment correlation | |
| | 1 | | Linear regression | |
| | 1 | | Non-linear regression | |
| | 1 | | Time series analysis by moving average | |
| | 1 | | Time series analysis by least square method | |
| | 1 | | Revision | |
| | 1 | | Question answer discussion | |
| | 1 | | Doubt clearing | |

## GEOCORO7P: STATISTICAL METHODS IN GEOGRAPHICY LAB

**Course Outcome**

1. Students will be able to represent the geographical data for frequency table and will be able to measure
2. Students will be able to analysis the sample data set through scatter diagram and linear regression.
3. Students will be able to analysis the collected data from the scatter diagram and linear regression
4. Students will be able to inculcate the aesthetic values in the.
5. Students will be able to work in a group.

**COURSE COORDINATOR: Dr. Rajat Halder**

**Teacher: R.H, M.M, A.M**

| Month | Hours/Classes | Teacher | Topic | Remarks |
|---|---|---|---|---|
| September | 1 | R.H | Construction of data matrix | Mode of |

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|---|---|---|---|---|
| | 1 | | Tally marks ,frequency table construction | teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 1 | | Mean: by different methods | |
| | 1 | | Median and mode and their graphical representation | |
| | 1 | | Quartiles and their graphical representation | |
| | 1 | | Histogram, frequency polygon, ogive | |
| | 1 | | Measures of dispersion :Range, quartile deviation, mean deviation | |
| | 1 | | Standard deviation and coefficient of variation | |
| OCTOBER | 2 | A.M | Drawing sample set from data matrix | |
| | 1 | | Use of random sampling | |
| | 2 | | Use of systematic sampling | |
| | 1 | | Use of stratified sampling | |
| | 2 | | Mapping the samples | |
| | 1 | | Revision and discussion | |
| DECEMBER | 2 | M.M | Concept of scatter diagram and correlation | |
| | 1 | | Diagrammatic representation | |
| | 2 | | Pearson's correlation coefficient and Spearman's rank correlation | |
| | 1 | | Regression by least square method and line of best fit | |
| | 2 | | Residual calculation and mapping | |
| | 1 | | Revision and discussion | |

## Remote sensing (GEOSSECO1M)

**Course Outcome**

1. Understand the basic principles of Remote Sensing, Types of RS satellites and sensors.
2. Elucidate sensor resolutions and their applications with reference to IRS and Landsat mission
3. Prepare False Colour Composites from IRS LISS-3 and Landsat TM and OLIdata.
4. Explain the principles of image correction and interpretation
5. Prepare inventories of landuse land cover (LULC) features from satellite images**.**
6. Explain concept of GIS and its applicability with emphasis on GIS data structures: types: spatial and non-spatial, raster and vector
7. Identify principles of GNSS positioning and waypoint collection and transferring waypoints to GIS and ability to perform area and length calculations from GNSS data.
8. Georeferencing of maps and images using Open Source software (QGIS), preparation of FCC and identification of features using standard FCC and other band combinations.
9. Perform digitisation of features, data attachment, overlay and preparation of annotated thematic maps (choropleth, pie chart and bargraphs)

**COURSE COORDINATOR: Mousume Ghosh (MG)**
**Teacher- Deepika Mondal**

| Month | Teacher | Hours | Topic | Remarks |
|---|---|---|---|---|
| JULY | DM | 1 | Principles of Remote Sensing (RS): | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | | 1 | Classification of RS satellites and sensors | |
| AUGUST | | 1 | Sensor resolutions and their applications with reference to IRS and Land sat missions, | |
| | | 1 | Image referencing schemes and data acquisition. | |
| | | 1 | Preparation of False Color Composites from IRS LISS-3 | |
| SEPTEMBER | | 1 | Land sat TM and OLI data. | |
| | | 1 | Principles of image rectification and enhancement. | |
| | | 1 | Class test | |
| NOVEMBER | | 1 | Principles of image interpretation and feature extraction | |
| | | 2 | Preparation of inventories of land use features from satellite images | |
| | | 2 | Preparation of inventories of Land cover features from satellite images | |
| DECEMBER | | 1 | Revision of land use map | |
| | | 1 | Revision of land cover map | |
| | | 1 | Class test | |

# 5th SEMESTER
## JULY-DECEMBER, 2020

### CREDIT DISTRIBUTION ACROSS COURSE FOR FIRST SEMESTER

| Course | Course Code | Title | Credit | Marks | remarks |
|---|---|---|---|---|---|
| Core | GEOACOR11T | Field Work and Research Methodology | 4 | 50 | compulsory |
| | GEOACOR11P | Field Work and Research Methodology(Lab)* | 2 | 25 | |
| | GEOACOR12T | Remote Sensing and GIS | 4 | 50 | compulsory |
| | GEOACOR12P | Remote Sensing and GIS(Lab)* | 2 | 25 | |
| DSE | GEOADSE01T | Soil and Bio geography | 6 | 75 | compulsory |
| DSE | GEOADSE02T | Settlement Geography | 6 | 75 | Students can opt any one Out of 2** |
| | GEOADSE03T | Population Geography | 6 | 75 | |

## Field Work and Research Methodology (GEOACOR11T)

**Course Outcome:**

1. Student will be able to learn about the meaning and significance of research
2. Student will be able to learn about the techniques of literature review
3. Student will be able to learn about the research problems, objectives, hypothesis as well as research materials and method
4. Student will be able to learn about the selection of study area, and pre-field preparation.
5. Student will be able to learn about the field technique of survey method etc,
6. Student will be able to learn about the method of data collection
7. Student will be able to learn about the post field methods, i.e. processing, quantitative and qualitative data analysis.

**COURSE COORDINATOR: Dr.Aditi Matilal**

**Teachers: Dr. Aditi Matilal And Prof.Deepika Mondal**

| Month | Hrs | Teacher | Topic | Remarks |
|---|---|---|---|---|
| July | 1 | AM | Meaning of research | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 2 | | Types of research | |
| August | 3 | | | |
| | 3 | | Significance of research | |
| | 1 | | Inter action session | |
| | 2 | | Question answer discussion | |
| | 1 | | Internal assessment | |
| | 2 | | Literature review | |
| | 1 | | Formulation of research design | |
| September | 2 | | Interaction | |
| | 1 | | Question answer discussion | |
| | 2 | | Quiz and MCQ test | |
| | 1 | | Defining research problem | |
| | 1 | | Research objectives | |
| | 4 | | Research hypothesis | |
| October | 2 | | Interactive session | |
| | 1 | | Question answer | |
| | 1 | | Internal assessment | |
| | 3 | | Research methods | |

## FIELD WORK AND RESEARCH METHODOLOGY (GEOACOR11P)

**Course outcome**

1. Student will be able to select the study area based on the discussion in the class room
2. Students will be able to learn about the techniques of primary data collection

3. Students will be able to learn about the techniques of preparation of field report
4. Students will be able to learn to work in a group.
5. Students will be able to gather the geographical knowledge of studied location.

**COURSE COORDINATOR:Dr.Aditi Matilal**

| Month | Hours | Topic | |
|---|---|---|---|
| **December** | **10** | **Literature Review** | **Dr. Madhab Mondal and Dr. Aditi Matilal will guide the students in completing a project on literature review** |
| | **13** | **Field Report** | **Field report will be prepared with secondary data sources. Dr. Rajat Halder and Dr. Aditi Matilal will help students to complete the project work.** |

## REMOTE SENSING AND GIS (GEOACOR12T)

### Course outcome

1. Understand the basic principles of Remote Sensing, Types of RS satellites and sensors.
2. Elucidate sensor resolutions and their applications with reference to IRS and Landsat missions.
3. Prepare False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.
4. Explain the principles of image correction and interpretation
5. Prepare inventories of land-use land cover (LULC) features from satellite images**.**
6. Explain concept of GIS and its applicability with emphasis on GIS data structures: types: spatial and non-spatial, raster and vector.
7. Identify principles of GNSS positioning and waypoint collection and transferring waypoints to GIS and ability to perform area and length calculations from GNSS data.
8. Geo-referencing of maps and images using Open Source software (QGIS), preparation of FCC and identification of features using standard FCC and other band combinations
9. Perform digitization of features, data attachment, overlay and preparation of annotated thematic maps (choropleth, pie chart and bar graphs).

### Geo-referencing of maps and images using Open Source software (QGIS), preparation of FCC and identification of features using standard FCC and other band combinations

**COURSE COORDINATOR: Dr. Rajat Halder**
**Teacher: Dr.Rajat Halder and Dr.Aditi Matilal**

| Month | Teacher | Hrs | Topic | |
|---|---|---|---|---|
| August | RH | 1 | Principles of Remote Sensing (RS) | Mode of teaching: Online (PowerPoint presentations and use of google jam board, |
| | | 2 | Types of RS satellites and sensors | |
| September | | 1 | Sensor resolutions | |
| | | 2 | Their applications with reference to IRS and Landsat missions | |
| | | 2 | Preparation of False Colour Composites from IRSLISS-3 and Landsat TM and OLI data | |

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|---|---|---|---|---|
| | | 4 | Principles of image correction and interpretation | teaching board and Microsoft paint) |
| | | 3 | Preparation of inventories of land-use land cover (LULC) | |
| | | 2 | Features from satellite images | |
| | | 1 | Revision | |
| | | 2 | Question Answer | |
| | | 2 | Internal assessment | |
| July | AM | 2 | Concept of GIS and its application | |
| | | 1 | Types and data structure of GIS | |
| August | | 1 | Concept of attribute tables and principles | |
| | | 1 | Data structure | |
| | | 2 | Overlay analysis | |
| | | 1 | GNSS | |
| | | 2 | Principles of GNSS positioning | |
| | | 1 | Concept of GPS and its advantages and disadvantages | |
| | | 2 | Concept of waypoint | |
| | | 2 | Principles of waypoint collection | |
| | | 1 | Data collection through GPS | |
| September | | 2 | Principles of data transfer from GPS receiver to computer | |
| | | 1 | Transferring way pointsto GIS | |
| | | 2 | Area and length calculation from GNSS data | |
| | | 2 | Revision | |
| | | 1 | Internal assessment | |

## REMOTE SENSING AND GIS (GEOACOE012P)

**Course outcome**

1. Student will be able to learn about the practical application of geo-referencing of maps using QGIS software
2. Student will be able to learn about the preparation of FCC
3. Student will be able to learn about the image processing through QGIS software
4. This programme can help the student as profession in future.
5. Student will be able to do work in a group.

**COURSE COORDINATOR: Dr. Madhab Mondal**

| | |
|---|---|
| October-December | Students will be assisted by Dr. Madhab Mondal and Dipika Mondal to accomplish a project work in QGIS. The project will include Geo-referencing of a map, preparation of FCC and image processing. Special Online classes will be scheduled after September aftermath completion of theory syllabus. |

## SOIL AND BIOGEOGRAPHY (GEOADSE01T)

### Course outcome

**1.** Student will be able to identify the factors of soil formation and also realize the importance of man in soil formation.
2. Student will be able to learn about the character of Lateritic soil, Podzol soil and Chernozem soil. On the basis of this knowledge they will be able to identify their local soil and their utility.
3. Student will be able to learn about the physical and chemical properties of soil and will be able to imply these knowledge on their local soil. On the basis of this knowledge they can select suitable crop for the concern soil.
4. Student will be able to take the suitable mitigation processes for local soil erosion and degradation.
5. Student will be able to get the primary concept about the ecosystem, biome etc and be able to identify the character of their local ecosystem as well as biome.
6. Student will be able to apply the knowledge of food chain, tropic structure etc on their local ecosystem. These can enhance the concept of micro level ecosystem management.
7. Student will be able to learn about the importance of bio diversity and can take the active participation in Man and Biosphere Programme from the grass root level.

**COURSE COORDINATOR: Dr. Madhab Mondal (MM)**
**Teachers: MM, SH**

| Month | Hrs | Teacher | Topic | Remarks |
|---|---|---|---|---|
| July | 2 | MM | Soil formation features | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| August | 2 | | Factors of soil formation | |
| | 1 | | Man as active agent of soil formation | |
| | 2 | | Soil profile | |
| | 2 | | | |
| | 1 | | Origin and profile characteristics: laterite | |
| | 2 | | | |
| | 1 | | Origin and profile characteristics: chernozem | |
| | 2 | | | |
| | 3 | | Origin and profile characteristics: podzol | |
| | 2 | | Definition and significance of soil properties | |
| September | 2 | | Soil Texture, structure and moisture | |
| | 1 | | Soil structure: types, significance | |
| | 2 | | | |
| | 3 | | Soil moisture | |
| | 2 | | Revision | |
| | 2 | | Question answer discussion | |
| | 2 | | Internal Assessment | |
| | 2 | | Soil PH | |
| | 1 | | Soil organic matter | |
| | 2 | | NPK | |
| | 2 | | Soil erosion | |

| | | | | |
|---|---|---|---|---|
| October | 1 | MM | Features of soil erosion | |
| | 2 | | Processes of soil erosion | |
| | 2 | | Soil degradation: Factors, processes and mitigation measures | |
| | 1 | | Principles of genetic soil classification | |
| | 2 | | USDA classification | |
| | 2 | | Concept of land capability and classification of land | |
| | 1 | | Revision | |
| | 2 | | Question answer discussion | |
| | 1 | | Internal Assessment | |
| July | 1 | SH | Concept of biosphere | |
| | 1 | | Ecosystem | |
| August | 1 | | Biome, Eco-tone | |
| | 1 | | Community, niche | |
| | 1 | | Succession, ecology | |
| | 1 | | Concepts of tropic structure | |
| | 1 | | Food chain | |
| | 1 | | Food web | |
| | 1 | | Energy flow | |
| September | 1 | | Revision | |
| | 1 | | Question answer discussion | |
| | 1 | | Internal assessment | |
| | 6 | | Tropical rain forest | |
| | 4 | | Taiga biome | |
| | 4 | | Grass land biome | |
| October | 1 | | Question answer discussion | |
| | 2 | | Spatial distribution of world fauna | |
| | 2 | | Bio-diversity | |
| November | 1 | | Revision | |
| | 1 | | Internal assessment | |
| December | 2 | | Man and biosphere | |
| | 2 | | Bio-geo chemical cycles | |
| | 1 | SH | CO2Cycle | |
| | 1 | | Nitrogen cycle | |
| | 1 | | Oxygen and other cycles | |
| | 1 | | Revision | |
| | 1 | | Question answer discussion | |

## Population Geography (GEOADSE03T)

**Course outcome**

**1.** The concept of population distribution helps the students to identify the allocation of the favorable conditions. Student will be able to relate these two variables which increase the analytical power of the students**.**

**2.** Student will be able to identify the regional disparity based on the population pattern of world as well as India.

3. Student will be able to indicate the stage of development of a certain society based on age-sex composition, literacy, education and will be able to suggest the appropriate remedial actions.
4. Student will be able to identify the socio-economic condition of a region based on the character of migration.
5. On the basis of the realization the students will be able to suggest the appropriate objectives of regional planning.

**COURSE COORDINATOR: Dr. Aditi Matilal**
**Teachers: RH, MM, AM**

| Month | Hrs | Teachers | Topic | Remarks |
|---|---|---|---|---|
| September | 1 | A.M | Development of Population Geography as a field of specialization | Mode of teaching: Online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint) |
| | 2 | | Relation between population geography and demography | |
| | 2 | | Sources of population data | |
| | 1 | | Level of reliability of population data | |
| | 2 | | Problems of mapping | |
| | 5 | | Population distribution | |
| | | | Population density and growth | |
| | | | Population growth | |
| | 6 | | Classical and modern theories in population distribution and growth | |
| | 3 | | Demographic transition model | |
| October | 3 | | World patterns determinants of population distribution and growth | |
| | 2 | | Concept of optimum population, over-population, under-population | |
| | 1 | | Population distribution, density and growth profile in India | |
| | 2 | | Revision | |
| | 1 | | Question answer discussion | |
| | **2** | | Internal assessment | |
| September | 2 | AM | Concept of age-sex composition | |
| | 2 | | Rural urban composition interms of age-sex structure | |
| | 1 | | Literacy and education | |
| | 2 | | Concept of fertility: measurement and controlling factors | |
| | 2 | | mortality: measurement and controlling factors | |
| | 1 | | Fertility: developed and developing nations | |
| | 2 | | Cohort and life tables | |
| | 2 | | Population composition | |
| | 1 | | Population composition in India | |
| October | 2 | | Urbanization: causes and consequences | |
| | 2 | | Types of urban centers | |

| | | | | |
|---|---|---|---|---|
| | 1 | | Occupational structure | |
| | 2 | | Occupational structure: rural and urban India | |
| | 2 | | Revision | |
| | 1 | | Question answer discussion | |
| | 1 | | Migration theories | |
| November | 1 | | Causesofmigration | |
| | 2 | | Types of migration | |
| | 1 | RH | Consequences of migration | |
| | 2 | | National and international migration trends | |
| December | 2 | | Development: concept and definitions | |
| | 1 | | Population resource regions and its types | |
| | 2 | | Concept of HDI | |
| | 2 | | Components of HDI | |
| | 1 | | Qualitative dimension of human resources | |
| | 2 | | Revision | |
| | 2 | | Question answer discussion | |
| | 1 | | Internal assessment | |
| | 2 | | Discussion | |
| November | 1 | M.M | Population policies in developed countries | |
| | 2 | | Population policies in developed countries in less developed countries, India | |
| | 1 | | Population policies in India | |
| | 2 | | Population and environment | |
| December | 1 | | Contemporary Issues–Ageing of Population | |
| | 2 | | Examples from developed and developing nations | |
| | 2 | | Declining Sex Ratio | |
| | 1 | | Sex ratio in India, child sex ratio | |
| | 2 | | Population and environment dichotomy,. | |
| | 2 | | HIV/AIDS | |
| | 1 | | Revision | |
| | 2 | | Question answer discussion | |

**LESSON PLAN**
**DEPARTMENT OF GEOGRAPHY**

**GEOGRAPHY HONOURS**
**JANUARY- JUNE, 2021**

## 2ND SEMESTER

### Distribution of courses in 2nd semester honours

| Sem | Course code | Course name | Credit | Marks | Allotted classes according to syllabus |
|---|---|---|---|---|---|
| 2ND | GEOACOR03T | Human Geography | 06 | 75 | 90 |
| | GEOACOR04T | Cartograms And Thematic Mapping | 04 | 50 | 60 |
| | GEOACOR04P | Cartograms And Thematic Mapping | 02 | 25 | 60 |

# HUMAN GEOGRAPHY (GEOACOR03T)

**Course Outcome**

1. Student will able to interpret about the impact of environment on human society.
2. In future student will be able to plan of new urban site based on urban morphology.
3. Student will be able to scientific discussion about the heterogeneity of races, ethnicity etc.
4. Student will able to realize about the evolution of human society therefore be able to show respect every human society.
5. Student will be able to find out the proper location for a new settlement.

**COURSE COORDINATOR: Dr.Madhab Mondal (MM)**
**Teachers: Dr.Madhab Mondal (MM) And Dr.Aditi Matilal (AM)**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **Unit-1 (Nature And Principles)** | | | | |
| May | 2 | MM | Human Geography: Concepts. Nature and scope | Mode of teaching: online (PowerPoint presentations and use of Google jam board, teaching board and Microsoft paint |
| | 1 | | Recent trends in Human Geography | |
| | 1 | | Elements of Human Geography | |
| | 3 | | Approaches to human geography | |
| | 2 | | Resource and human geography | |
| | 1 | | Locational approach in human geography | |
| | 1 | | Landscape approach in human geography | |
| | 1 | | Environmental approach in human geography | |
| | 1 | | Concept of race: Definition, classification | |
| | 2 | | Races of India | |
| | 2 | | Ethnicity: concept, definition, categorization | |
| | 2 | | Space in human geography | |
| | 1 | | Society: concept, nature and characteristics | |
| JUNE | 3 | | Cultural regions of India | |
| | 3 | | Linguistic regions of India | |
| | 3 | | Religion: Concept, origin, characteristics | |
| | 3 | | Revision, question answer discussion | |
| | 2 | | Internal Assessment | |
| **Unit- 2 (Society, demography and ekistics)** | | | | |
| April | 2 | RH | Evolution of human society | Mode of teaching: online (PowerPoint presentations and use of google jam board, |
| | 1 | | Hunting and food gathering: Characteristics, evolution | |
| | 1 | | Pastoral nomadism: evolution, characteristics, locational attributes | |
| | 1 | | Characteristics of subsistence farming | |
| | 1 | | Nature of industrial society: evolution, nature and features | |
| | 1 | | Human adaptation to environment : Eskimo | |
| | 1 | | Human adaptation to environment : Masai | |

| | | | | |
|---|---|---|---|---|
| | 1 | | Human adaptation to environment : Maori | teaching board and Microsoft paint |
| | 3 | AM | Growth of population: Controlling factors | |
| | 4 | | Distribution of population: nature and influencing factors | |
| May | 2 | | Population composition | |
| | 4 | | Demographic transition | |
| | 3 | | Population resource regions: Concept and classification | |
| June | 2 | | Rural settlements: Types and patterns | |
| | 5 | | Morphology or urban settlements: Critical analysis of settlement theories of Burgess, Hoyt and C.D. Harris and E. Ullman | |
| | 2 | | **Internal assessment** | |

## CARTOGRAMS AND THEMATIC MAPPING (GEOACOR04T)

**Course Outcome**

1. 1. Students will get a clear concept about the cartograms. thematic mapping.
2. Students will get a clear concept about the thematic mapping.
3. Students will be able to differentiate them.
4. Student will get a theoretical concept about the surveying.
5. Student will get the concept about the survey equipments.

**COURSE COORDINATOR: Dr.Rajat Halder**
**Teachers: R.H, SH, DM**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| MAY | 2 | RH | Concepts of rounding | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 2 | | Concepts of scientific notation | |
| | 2 | | Logarithm: concept and uses | |
| | 2 | | Anti-logarithm: concept and uses | |
| | 3 | | Natural and log scales | |
| APRIL | 2 | SH | Diagrammatic data representation: Line graph: concept, uses, advantages and disadvantages, construction principles | |
| | 2 | | Bar graph: Concept, classification, uses, advantages and disadvantages | |
| | 2 | | Isopleths: Concepts, construction principles, advantages and disadvantages | |
| | 1 | | Representation of area data- Dots and sphere: Concepts, construction principles, advantages and disadvantages | |
| MAY | 2 | | Proportional Circles: Concepts, construction principles, advantages and disadvantages | |

| | | | | |
|---|---|---|---|---|
| | 2 | | Choropleth: Concepts, construction principles, advantages and disadvantages | |
| | 2 | | Preparation and interpretation of land-use and land cover maps | |
| | 1 | | Preparation and interpretation of socio-economic maps | |
| JUNE | 1 | RH | Bearing: Magnetic and true | |
| | 2 | | Whole-circle and reduced bearing | |
| | 2 | | Basic concept of surveying and survey equipment | |
| | 2 | | Prismatic Compass: Instrument parts and functioning, uses, significance | |
| | 2 | | Dumpy level: Instrument parts and functioning, uses, significance | |
| | 2 | | Theodolite: Instrument parts and functioning, uses, significance | |
| | 2 | | **Internal assessment** | |

## CARTOGRAMS AND THEMATIC MAPPING (GEOACOR04P)

**Course Outcome**

1. Student will able to represent the statistical data into a graphical picture.
2. This multi dimensional creativity will create an aesthetic value in them.
3. Students will get hand hold training about prismatic and Dumpy Level survey.
4. These will help them in higher studies during the field work.
5. Students will de able to work in a group.

**COURSE COORDINATOR: Dr.Rajat Halder**

**TEACHERS: RH, SH, DM**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| JUNE | 1 | SH | Thematic mapping: Concept and principles | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 2 | | Choropleth map: Construction and interpretation | |
| | 3 | | Dots and spheres: Construction and interpretation | |
| | 3 | | Proportional pie-diagrams: Construction and interpretation | |
| APRIL | 3 | DM | Traverse survey using prismatic compass: Data collection, tabulation, calculation and diagrammatic representation | |
| MAY | 5 | | Profile survey using dumpy level: Data collection, tabulation, calculation and diagrammatic representation | |
| JUNE | 4 | | Practice class | |

# 4TH SEMESTER

## Distribution of courses in 4th Semester Honours

| SEM | COURSE CODE | COURSENAME | CREDIT | MARKS | Allotted classes according to syllabus |
|---|---|---|---|---|---|
| 4TH | GEOACOR08T | Regional Planning | 06 | 75 | 90 |
| | GEOACOR09T | Economic Geography | 06 | 75 | 90 |
| | GEOACOR10T | Environmental Geography | 04 | 50 | 60 |
| | GEOACOR10P | Environmental Geography | 02 | 25 | 60 |
| | GEOSSEC02M | Advanced spatial statistical techniques | 02 | 25 | 60 |

## GEOACOR08T – REGIONAL PLANNING AND DEVELOPMENT

**Course Outcome**

1. Understand the concept of regions, their classification and their delineation
2. Explain the types, principles, objectives, tools and techniques of Regional Planning with emphasis on need for regional planning in India, multi- level planning in India
3. Understand metropolitan concept and urban agglomerations
4. Elucidate concepts of growth, development, underdevelopment, indicators and measures of economic, social, environmental and human development
5. Critically analyze the theories and models for regional development: Cumulative causation(Myrdal), Stages of development (Rostow), growth pole model(Perroux)
6. Decipher the trends of regional development in India with emphasis on disparity and diversity

**COURSE COORDINATOR: DR.ADITI MATILAL**
**TEACHERS: DR. ADITI MATILAL (AM) AND DEEPIKA MONDAL (DM)**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **UNIT-1 (REGIONAL PLANNING)** | | | | |
| APRIL | 2 | AM | Concept of regions | Mode of teaching: |
| | 2 | | Types of regions: Formal and functional | |

| | | | | |
|---|---|---|---|---|
| | 2 | | Delineation of region | online (PowerPoint presentations and use of Google jam board, teaching board and Microsoft paint |
| | 2 | | Types of regional planning | |
| | 2 | | Principles of regional planning | |
| | 2 | | Objectives of Regional Planning | |
| MAY | 3 | SH | Tools and techniques of regional delineation | |
| | 3 | | Need for regional planning in India | |
| | 3 | | Multi-level planning: an Indian perspective | |
| | 2 | | Revision and discussion | |
| | 2 | | **Internal Assessment** | |
| | 3 | | Concept of metropolis: nature, characteristics, growth | |
| | 2 | | Urban agglomeration: growth and characteristics | |
| **UNIT -2 REGIONAL DEVELOPMENT** | | | | |
| APRIL | 2 | DM | Concept of growth | Mode of teaching: online (PowerPoint presentations and use of Google jam board, teaching board and Microsoft paint |
| | 2 | | Concept of development | |
| | 2 | | Growth vs development | |
| | 1 | | Indicators of development | |
| MAY | 2 | | Economic development | |
| | 2 | | Social development | |
| | 2 | | Environmental development | |
| | 1 | | Human development : concept and measurement | |
| JUNE | 2 | | Revision and discussion | |
| | 2 | | **Internal Assessment** | |
| | 2 | | Measures of Human development : | |
| | 3 | | Indicators of human development | |
| MAY | 4 | AM | Myrdal's theory of Cumulative Causation | |
| | 4 | | Rostow's theory of stages of development | |
| | 4 | | Growth pole Model, Perroux | |
| | 3 | | Underdevelopment- concept and causes | |
| | 3 | | Regional development in India | |
| JUNE | 2 | | Regional disparity in India: nature and causes | |
| | 2 | | Regional diversity in India | |
| | 2 | | Need and measures for balanced development in India | |

# ECONOMIC GEOGRAPHY (GEOACOR09T )

**Course Outcome**

1. Explicate the meaning, concepts and approaches to Economic Geography with emphasis on goods and services, production, exchange and consumption, concept of economic man, theories of choices economic distance and transport costs, concept and classification of economic activities
2. Identify the factors affecting location of economic activity with special reference to agriculture (Von Thünen), and industry (Weber)
3. Classify economic activities and identify the nature, characteristics and significance of different types of primary, secondary and tertiary activities.
4. Understand the evolution, structure functions and significance of international trade.
5. Understand the economic blocs: WTO, GATT and BRICS

**COURSE COORDINATOR: Dr. Rajat Halder (Rh)**
**Teachers: Dr. R. Halder (Rh) & Susmita Halder(Sh)**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **UNIT- 1 (CONCEPTS)** | | | | |
| APRIL | 2 | RH | Meaning and approaches of economic geography | Mode of teaching: online (PowerPoint presentations and use of Google jam board, teaching board and Microsoft paint |
| | 2 | | Concepts of goods and services | |
| | 2 | | Concept of production, exchange and consumption | |
| | 2 | | Economic Man: Concept and characteristics | |
| | 1 | | Theories of choice | |
| MAY | 1 | | Economic distance | |
| | 1 | | Transport cost | |
| | 2 | | **Internal Assessment** | |
| **UNIT-2 (Economic activities)** | | | | |
| APRIL | 1 | SH | Economic activities: Concept and classification | |
| | 2 | | Agricultural locational theory of Von Thunen | |
| | 2 | | Industrial locational theory of Weber | |
| | 1 | | Primary activities : Agriculture | |
| | 1 | | Forestry as a primary economic activity | |
| | 1 | | Fishing as a primary economic activity | |
| | 1 | | Mining as a primary economic activity | |
| | 1 | | Secondary activity: nature and characteristics | |
| | 1 | | Manufacturing industry: concept, characteristics | |
| | 1 | | Cotton textile industry: growth, factors of development, location etc | |
| | 1 | | Iron and steel industry: growth, factors of development, location etc | |
| | 1 | | Tertiary activities: Transport, trade and services | |
| | 1 | | Tea plantation in India | |
| | 2 | | **Internal Assessment** | |
| | 1 | | Mixed farming in Europe | |
| MAY | 1 | RH | Trans-national sea routes | |
| | 1 | | Railways of India | |
| | 1 | | Highways of India: State, National etc | |
| | 1 | | International trade | |
| | 3 | | Economic blocks: WTO, GATT, BRICS: Evolution, structure and functions | |

# ENVIRONMENTAL GEOGRAPHY (GEOACOR10T)

**Course Outcome**

1. Identify geographers' approach to environmental studies and acquire comprehensive knowledge about the concept of holistic environment and systems approach
2. Understand the concept structure and functions of ecosystem
3. Delineate the space–time hierarchy of Environmental problems at local, regional and global scales
4. Identify different environmental issues with special reference to the causes and consequences of land, water and air pollution and degradation, waste management
5. Elucidate important environmental policies viz. National Environmental Policy (2006), Earth Summits (Stockholm, Rio, Johannesburg) and Global initiatives for environmental management (special reference to Montreal Protocol, Kyoto Protocol, Paris Climate Summit)
6. Acquire skills of conducting perception survey on environmental problems and acquire knowledge on environmental impact assessment and air quality.
7. Identify the check-list for environmental impact assessment of an urban / industrial project and interpret air quality using CPCB / WBPCB data

**COURSE COORDINATOR: DR.Madhab Mondal**
**Teachers: MM, RH & SH**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **UNIT- 1 (CONCEPTS)** | | | | |
| APRIL | 3 | MM | Geographers approach to environmental studies | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 3 | | Concept of holistic environment | |
| | 3 | | System approach in environmental study | |
| MAY | 2 | | Concept of eco system | |
| | 4 | | Structure of eco-system | |
| | 3 | | Function of eco-system | |
| | 2 | | Space-time hierarchy of environmental problems: local, regional and global | |
| JUNE | 4 | | Space-time hierarchy of environmental problems: local, regional and global (continued) | |
| **UNIT -2 (ENVIRONMENTAL PROBLEMS AND POLICIES)** | | | | |
| JUNE | 2 | RH | Environmental pollution and degradation | |
| | 2 | | Land pollution: Causes, types, impact, remedial measures and conservation | |
| | 2 | | Water pollution: Causes, types, impact, remedial measures and conservation | |
| | 4 | | Air pollution: Causes, types, impact, remedial measures and conservation | |
| | 3 | SH | Urban environmental issues with special reference to waste management | |

| | | | | |
|---|---|---|---|---|
| | 2 | | Environmental policies | |
| | 2 | | National environmental policy 2006 | |
| | 4 | | Earth Summit (Stockholm, Rio and Johannesburg) | |
| | 3 | | Environmental Management ( Montreal Protocol, Kyoto protocol, Paris climatic summit) | |
| | 2 | | Revision and discussion | |
| | 1 | | **Internal Assessment** | |

## GEOACOR10P ENVIRONMENTAL GEOGRAPHY

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| JUNE | 10 | MM | Preparation of questionnaire for perception survey on environmental problems | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| JUNE | 5 | RH | Preparation of check-list for environmental Impact assessment on urban / industrial project | |
| JUNE | 10 | AM | Interpretation of air quality using CPCB / WBPCB data | |

## SKILL ENHANCEMENT COURSE
## Advanced spatial statistical techniques (GEOSSEC02M)

**Course Outcome**

1. Understand probability theory, probability density functions with respect to Normal, Binomial and poisson distributions and their geographical applications.
2. Understand sampling, sampling plans for spatial and non-spatial data, sampling distributions, sampling estimates for large and small samples tests involving means and proportions
3. Perform correlation and regression analysis with special reference to rank order correlation and product moment correlation, linear regression, residuals from regression, simple curvilinear regression and multi-variate
4. Perform time series analysis with emphasis on time Series processes, smoothing time series, time series components.
5. The knowledge of SKC will help the student in future.

COURSE COORDINATOR: Susmita Halder
Teacher: SDG, PPR,MG

| MONT | NO OF | NAME OF | TOPIC | REMARK |
|---|---|---|---|---|

| H | CLASSES | TEACHER | | S |
|---|---|---|---|---|
| APRIL | 1 | SDG | Probability theory | Mode of teaching: offline(PowerPoint presentations are used occasionally or wherever necessary) |
| | 1 | | Probability density functions with respect to Normal distribution | |
| | 5 | | Probability density functions with respect to Binomial distribution | |
| | 4 | | Probability density functions with respect to Poisson distribution | |
| | 2 | | Sampling : basic concept and uses | |
| MAY | 2 | | Sampling Plans for spatial and non-spatial data | |
| | 1 | | Sampling distributions | |
| | 2 | | Sampling estimates for large and small sample tests involving means and proportions | |
| JUNE | 2 | PPR | | |
| | 2 | | Correlation and Regression: Introduction and basic concept | |
| | 2 | | Rank order correlation | |
| | 2 | | Product moment correlation | |
| | 2 | | Linear Regression | |
| | 2 | | Residuals from regression | |
| | 2 | | Multi-variate regression | |
| JUNE | 4 | MG | Time series Analysis | |

# LESSON PLAN FOR 6TH SEMESTER

## CREDIT DISTRIBUTION ACROSS COURSE

| SEM | COURSE CODE | COURSENAME | CREDIT | MARKS | Allotted classes according to syllabus |
|---|---|---|---|---|---|
| 6TH | GEOACOR13T | Evolution Of Geographical Thought | 06 | 75 | 90 |
| | GEOACOR14T | Remote Sensing And GIS | 04 | 50 | 60 |
| | GEOACOR14P | Remote Sensing And GIS Lab | 02 | 25 | 25 |
| | GEOADSE04T | Hydrology And Oceanography | 06 | 75 | 90 |
| | GEOADSE06T | Resource Geography | 06 | 75 | 90 |

# EVOLUTION OF GEOGRAPHICAL THOUGHT (GEOACOR13T)

**Course Outcome**

**1.** Students will be able to get a clear picture about the development of geography from pre modern age to recent time.
2. Student will be able to know the contributions of great geographers which increase the will-force of the student.
3. Students will learn about the development of geography in different parts of the world, i.e. USA, France, Britain, Germany and will be able to find out the connectivity, uniqueness etc among these different schools.
4. This capability will grow the holistic sense in the mind of students.
5. The long tradition and legacy of geography will create the humanity, values among the students.

**COURSE COORINATOR: Dr. Rajat Halder**
**Teachers: MM, RH, AM**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **Unit-1 (Nature of pre-modern geography)** | | | | |
| APRIL | 2 | MM | Development of Geography: a temporal perspective | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 2 | | Contribution of Greek geographers | |
| | 2 | | Contribution of Chinese geographers | |
| | 2 | | Impact of dark age in Geography | |
| | 2 | | Contribution of Arab geographers | |
| | 2 | | Geography during the age of Discovery and Exploration | |
| | 1 | | Contribution of Columbus | |
| | 1 | | Contribution of Vasco-da-Gama | |
| | 1 | | Contribution of Magellan | |
| MAY | 2 | | Dualism and dichotomies in Geography | |
| | 2 | | Idiographic and Nomothetic approach in Geography | |
| | 1 | | Physical and Human Geography | |
| | 4 | | Determinism and Possibilism in the perspective of man nature relationship | |
| **Unit- 2 (Foundation of modern geography and recent trends)** | | | | |
| APRIL | 2 | RH | Evolution of geographical thoughts in Britain | |
| | 2 | | Evolution of geographical thought in United States of America | |
| | 2 | | Contributions of Alexander Von Humboldt in the evolution of modern geography | |
| | 2 | | Contributions of Carl Ritter | |
| | 2 | | Contributions of Friedrich Ratzel and concept of living space | |
| | 2 | | Contributions of Vidal-de-la Blache | |
| | 1 | | Internal assessment | |

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|---|---|---|---|---|
| APRIL | 2 | AM | Trends in geography in post Second world war | |
| | 4 | | Quantitative Revolution: Concept, origin, advantages and disadvantages | |
| | 3 | | System Approach in Geography | |
| | 3 | | Critical geography: Evolution and concept | |
| | 4 | | Behavioral approach in geography: concept and origin, characteristics, significance | |
| MAY | 3 | | Humanistic approach in geography: concept, origin, characteristics and significance. | |
| | 3 | | Radicalism: concept, origin, characteristics, significance | |
| | 2 | | Time and space in Geography in 21st century | |

# DISASTER MANAGEMENT (GEOACOR14T)

**Course Outcome**

1. Student will be able to distinguish between hazards and disaster. This will help them to identify the hazards or disaster, when it hit in their locality.
2. Student will be able to identify the factors of hazards which they will face in their locality.
3. Student will be able to take primary remedial activities against any hazards.
4. This knowledge will save them and their locality.
5. Student will be aware about the importance of their local resources.

**COURSE COORDINATOR: Dr. Madhab Mondal**
**Teachers: DM, SH, MM**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **UNIT- 1 (CONCEPTS)** | | | | |
| APRIL | 1 | DM | Classification of hazards | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 1 | | Classification of disasters | |
| | 1 | | Approaches to hazard study | |
| | 1 | | Risk perception: concept and nature | |
| | 1 | | Vulnerability assessment: concept and techniques | |
| | 1 | | Hazard paradigms | |
| APRIL | 1 | SH | Responses to hazards | |
| | 1 | | Prepararedness to hazard | |
| | 1 | | Trauma and aftermath of hazard | |
| | 1 | | Resilience and capacity building | |
| | 1 | | Hazard mapping | |
| | 1 | | Data generation for hazard mapping | |

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|---|---|---|---|---|
| | 1 | | Geospatial techniques for data representation | |
| **UNIT- 2 (HAZARD-SPECIFIC STUDY WITH FOCUS ON INDIA)** | | | | |
| MAY | 3 | MM | Earthquake: definition, factors, effects, vulnerability | |
| | 2 | | Consequences and management of earthquake | |
| | 1 | | Earthquake: Zonation mapping | |
| | 2 | | Landslide: definition, factors, effects, vulnerability | |
| | 2 | | Consequences and management of landslide | |
| | 1 | | Landslide zonation: Indian perspective | |
| JUNE | 2 | | Tropical cyclone: definition, factors, effects, vulnerability | |
| | 2 | | Consequences and management of cyclones | |
| | 1 | | Cyclone in West Bengal | |
| | 1 | | River bank erosion: causes. Vulnerability, impact | |
| | 1 | | Consequences of river bank erosion | |
| | 1 | | Management of bank erosion | |
| | 1 | | Examples from southern part of West Bengal | |
| | 1 | | Radio-active fallout : concept, factors, types and nature | |
| | 1 | | Vulnerability of radio-active pollution | |
| | 1 | | Consequences of radio-active pollution and its management | |
| | 1 | | Internal assessment | |

## DISASTER MANAGEMENT (GEOACOR14P)

**Course Outcome**

Student will learn how to prepare a project report.
2. A group work may inculcate the leadership, unity, humanity, togetherness, empathy among the students.
3. The completion of project report will help the students in hazards based higher study.
4. Student will get a hand hold experience through disaster management.
5. Student will get a comprehensive knowledge in a certain locality.

**COURSE COORDINATOR: DR. MADHAB MONDAL**

**At the initiation of the semester each student will be allotted a project work on disaster management from the following topics:**

- **Thunderstorm**
- **Landslides**
- **flood**
- **River bank erosion / coastal erosion**
- **Fire**
- **Industrial accident**
- **Structural collapse**

**Throughout the semester the student will collect secondary data on any of the selected topic and on the basis of that will prepare an individual project with cartographic representations and write-ups. Teachers will guide the students whenever necessary.**

# GEOADSE04T (HYDROLOGY AND OCEANOGRAPHY)

**Course Outcome**

1. Understand systems approach in hydrology and the concept of global hydrological cycle, its physical and biological role
2. Identify the controlling factors of run-off, with emphasis on infiltration and evapo-transpiration
3. Describe drainage basin as a hydrological unit and explain the principles of water harvesting and watershed management
4. Explain the concept of groundwater and identify the factors controlling recharge, discharge and movement
5. Describe the major relief features of the ocean floor, its characteristics and origin according to plate tectonics, physical and chemical properties of ocean water, water mass, T–S diagram, ocean temperature and salinity and marine resources.

**COURSE COORDINATOR: DR. ADITI MATILAL**
**Teacher: DM, MM, AM**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **UNIT -1 Hydrology** | | | | |
| MAY | 2 | DM | System approach in hydrology: Concept of system and its application in hydrological study | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 2 | | Global hydrological cycle: Concept and significance | |
| | 1 | | Hydrological cycle: Global and local perspectives | |
| | 1 | | Hydrological cycle: Physical and biological role | |
| | 1 | | Run-off : Concept, definition, controlling factors | |
| | 1 | | Infiltration and evapo-transpiration | |
| | 1 | | Concept and significance of run-off | |
| JUNE | 2 | | Run-off cycle: Concept and characteristics | |
| | 1 | | Drainage basin as a hydrological unit | |
| | 2 | | Principles of water harvesting, types, characteristics | |
| | 1 | | Water-shed management | |
| | 1 | | REVISION | |
| | 1 | | **Internal assessment** | |
| JUNE | 2 | MM | Ground water: Concept, type | |
| | 2 | | Factors controlling ground water discharge and recharge | |
| | 2 | | Ground water movement with special emphasis on Darcy's Law | |
| | 2 | | Ground water movement: type and significances | |
| **Unit- 2 (Oceanography)** | | | | |
| MAY | 2 | AM | Major relief features of ocean floor: Concept and classification | |

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|---|---|---|---|---|
| | 6 | | Characteristics and origin of relief features in the light of Plate tectonics | |
| | 2 | | Physical properties of ocean water | |
| | 2 | | Chemical properties of ocean water | |
| | 2 | | Water mass: Concept and classification | |
| | 2 | | Characteristics of different water mass | |
| | 2 | | T-S diagram | |
| | 2 | | Ocean Temperature: Controlling factors | |
| JUNE | 2 | | Horizontal distribution of ocean temperature | |
| | 2 | | Vertical distribution of ocean temperature | |
| | 2 | | Salinity of ocean water: Controlling waters | |
| | 1 | | Variation in salinity: Regional scale | |
| | 1 | | Marine resources: classification and sustainable utilization | |
| | 1 | | Sea level change: types, causes and significance | |
| | 1 | | Revision | |
| | 1 | | Internal assessment | |

# RESOURCE GEOGRAPHY (GEOADSE06T)

**Course Outcome**

1. Elucidate the concept of resource, uses, functionability, classification etc
2. Classify natural resources
3. Explain the utilitarian, conservational, community based adaptation approaches to resource utilization:
4. Elucidate the problems of resource depletion—global scenario (forest, water, fossil fuels.
5. Understand the distribution, utilisation, problems and management of mineral resources, energy resources

**COURSE COORDINATOR: Dr. Rajat Halder**
**Teachers: Dr. Rajat Halder (RH), Susmita Halder ( SH)**

| MONTH | NO OF CLASSES | NAME OF TEACHER | TOPIC | REMARKS |
|---|---|---|---|---|
| **Unit-1 ( Resource and Development)** | | | | |
| MAY | 2 | RH | Natural resources: concept and classification | Mode of teaching: online (PowerPoint presentations and use of google jam board, teaching board and Microsoft paint |
| | 2 | | Approaches to resource utilization: Utilitarian | |
| | 2 | | Approaches to resource utilization: Conservational | |
| | 2 | | Approaches to resource utilization: Community-based adaptation | |
| | 2 | | Significance of resource: backbone of economic growth and development | |

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|---|---|---|---|---|
| | 2 | | Pressure on resources | |
| | 2 | | Appraisal and conservation of natural resources | |
| JUNE | 3 | | Problems of resource depletion: Global perspective | |
| | 4 | | Forest resources of India | |
| | 4 | | Water resources of India | |
| | 3 | | Fossil fuels: Concept, definition and characteristics | |
| | 3 | | Sustainable resource development | |
| | 1 | | REVISION | |
| | 1 | | Internal assessment | |
| **Unit- 2 Resources, conflict and management** | | | | |
| MAY | 2 | SH | Mineral resources: Bauxite (Distribution, utilization, problems and management ) | |
| | 2 | | Mineral resources: Iron ore (Distribution, utilization, problems and management ) | |
| | 2 | | Conventional resources: (Distribution, utilization, problems and management ) | |
| | 2 | | Non-conventional resources: (Distribution, utilization, problems and management ) | |
| JUNE | 2 | | Contemporary energy crisis and future scenario | |
| | 2 | | Limits to growth | |
| | 2 | | Sustainable resource utilization | |
| | 2 | | Resource sharing: Water | |
| | 1 | | Revision | |