

**MANIPUR UNIVERSITY  
SYLLABUS  
FOR  
FOUR YEAR UNDERGRADUATE PROGRAMME (FYUP) IN GEOGRAPHY  
2025**

**In accordance with the Manipur University Ordinance  
For Four Year Undergraduate Programme (FYUP), 2025 based on NEP-2020  
w.e.f. Academic Session 2025-26**



**DEPARTMENT OF GEOGRAPHY  
School of Human and Environment Sciences  
Manipur University, Canchipur, Imphal-795003**

**Manipur University**  
**Academic Level:4.5 and Semester:I**  
**Syllabus for Major – 1 (Theory)**

|   |   |              |               |                |                  |
|---|---|--------------|---------------|----------------|------------------|
| Nature of Course                                | Major   |              |               |                |                  |
| Course Code                                     | MJC45GEG101(T) 25                                   |              |               |                |                  |
| Course Title                                    | Foundations of Geography                            |              |               |                |                  |
| Course Level                                    | 100   |              |               |                |                  |
| Credit Details                                  | Total Credit  | Lecture/Week | Tutorial/Week | Practical/Week | Total Hours/Week |
|   | 3   | 3            | --            | --             | 3                |
| Course Audience                                 | Students pursuing First Semester Major in Geography |              |               |                |                  |
| Proposed by (for Non-Core Course)               |   |              |               |                |                  |
| Pre Requisite (if any)                          | Basic knowledge of Geography and Astronomy          |              |               |                |                  |
| Skill Training Required (if any)                |   |              |               |                |                  |
| Pre Requisite Course Required (if any)          |   |              |               |                |                  |
| Faculty Eligibility and Specialisation (if any) |   |              |               |                |                  |

**Course Objectives:**

1. Understanding the nature of geography.
2. General overview on physical and human dimensions of geography.
3. General overview on applied aspects and trends of geography.

**Course Learning Outcomes:**

Upon completion of the course the learner will be able to:

1. Understand the nature and scope of geography.
2. Understand the physical and human aspects of geography.
3. Understand the career opportunities of geography.
4. Understand the applied aspects of geography and recent trend in geography.

**Detailed Syllabus Content**

| Unit | Unit Name           | Detailed Syllabus  | Credit |
|------|---------------------|--|--------|
| I    | Nature of Geography | Meaning, scope, branches, and approaches of geography; Emergence of geography as a subject; Importance of geography; Place | 1      |

|     |  |  |   |
|-----|--|--|---|
|     |  | of geography in the classification of science; Geography and other disciplines.  |   |
| II  | Physical and Human Dimensions of Geography         | Physical Dimension of Geography: Universe, galaxies, solar system and Earth; Shape and size of the Earth; Revolution and rotation of the Earth; The seasons; Age of the Earth; Longitudes, latitudes, and time. The Human Dimension in Geography: Man and environment; Society, culture, and civilization. | 1 |
| III | Modern Concepts in Geography and Applied Geography | Modern concepts in geography; Study of geography in India; Career opportunities for geographers and recent trends in geography. Applied Geography: Definition, necessity, themes, emerging scope, method, and theoretical bases; Challenges and limitations.   | 1 |

### Suggested Readings:

1. Adhikari, Sudepta (2015): Fundamentals of Geographical Thought, Orient Black Swan, New Delhi.
2. Dwivedi, A.K. (2021): Fundamentals of Geography, Vanya Publications, Kanpur.
3. Gregory, Derek et al eds. (2009): The Dictionary of Human Geography, 5th Edition, Wiley Black Well, Chichester.
4. Jain, Ritu (2018): Fundamentals of Geography, Pratyush Publications, Delhi.
5. Kaushik, Dr. S.D. and Rawat, Dr. D.S. (2018): Geographical Thought and Methodology, Rastogi Publications, Meerut.
6. Khullar, D.R. (2019): Physical Geography, Kalyani Publications, Ludhiana.
7. Husain, Majid (2018): Fundamentals of Physical Geography 5th Edition, Rawat Publications, Jaipur.
8. Leong, Goh Cheng (2020): Certificate Physical and Human Geography, Oxford University Press, New Delhi.
9. Maiti, Ramkrishna and Maiti, Moumita Moitra (2021) Development of Geographical Thought – Contextualisation and Synthesis of Philosophies, Nabodaya Publications, Kolkata.
10. Maurya, Dr. S.D. (2016): History of Geographical Thought, Sharda Pustak Bhawan, Allahabad.
11. Maurya, Dr. S.D. (2016): Cultural Geography, Sharda Pustak Bhawan, Allahabad.
12. Singh, R.P. (2005): Teaching of Geography, R. Lall Book Depot, Meerut.

Note: Internet sources may be used for the areas for which books are not available.

### **Additional Readings:**

1. Bunnett, R. B. and Parihar, Seema Bala (2019): Physical Geography in Diagrams, 4<sup>th</sup> Edition, Pearson Education, Noida.
2. Dasgupta, A.K. and A.N. Kapoor (2004): Principles of Physical Geography, S. Chand and Company, New Delhi.

### **Course Teaching-Learning Process**

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing
- Presentation through Poster and Power Point

Linkage between Programme Learning Outcome (POs) and Course Learning Outcome (COs)

| L   | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2    | 1    | 3    | 0    | 2    | 1    |
| CO2 | 2    | 1    | 3    | 0    | 2    | 1    |
| CO3 | 2    | 1    | 3    | 0    | 2    | 1    |
| CO4 | 2    | 1    | 3    | 0    | 2    | 1    |

3: High, 2: Medium, 1: Low, 0: No Correlation

### **Assessment Methods**

- Written examination
- Close-book and open-book test
- Problem solving exercise
- Individual and group project
- Seminar and presentation
- Interaction session

**Manipur University**  
**Academic Level: 4.5 and Semester: I**  
**Syllabus for Major-1 (Practical)**

|   |   |              |               |                |                 |
|---|---|--------------|---------------|----------------|-----------------|
| Name of Course                                  | Major   |              |               |                |                 |
| Course Code                                     | MJC45GEG101(P)25                                    |              |               |                |                 |
| Course Title                                    | Simple Astronomical Calculation and Scale           |              |               |                |                 |
| Course Level                                    | 100   |              |               |                |                 |
| Credit details                                  | Total Credit  | Lecture/Week | Tutorial/Week | Practical/Week | Total Hour/Week |
|   | 1   | --           | --            | 1              | 2               |
| Course Audience                                 | Students pursuing First Semester Major in Geography |              |               |                |                 |
| Associated Theory Course (topics)               | 1. Physical Dimensions of Geography                 |              |               |                |                 |
| Skill Training Required (if any)                |   |              |               |                |                 |
| Pre-Requisite Course Required (if any)          |   |              |               |                |                 |
| Faculty Eligibility and Specialization (if any) |   |              |               |                |                 |

**Course Description:**

1. This course is designed to learn calculation of physical properties of the earth
2. To facilitate learners to understand how to calculate local time and time of sunrise and sunset.
3. Learner will be able to construct and draw various types of scale.

**Course Learning Outcomes:**

Upon completion of the course the learner will be able to:

1. Calculate of physical properties of the earth.
2. Calculate local time and time of sunrise and sunset.
3. Construct and draw various types of scale.

**Detailed Syllabus Content**

| Sl. No. | List of Practical                                    | No. of Session |
|---------|--|----------------|
| 1       | Measurement of shape and size of the Earth.          | 1              |
| 2       | Calculation of radius of the Earth.                  | 1              |
| 3       | Calculation of altitudes and declination of stars.   | 2              |
| 4       | Determination of time and calculation of local time. | 2              |

|   |  |   |
|---|--|---|
| 5 | Calculation of time of sunrise and sunset.                                   | 2 |
| 6 | Definition, types and methods of representation of scale.                    | 1 |
| 7 | Construction and drawing of plain, diagonal, comparative and vernier scales. | 6 |

### **Suggested Readings:**

1. Khullar, D.R. (2016): *Essentials of Practical Geography*, Academic Publishing Co, Jalandhar.
2. Maltiar, K.K. and Maltiar, (Mrs) S.R. (2022): *Concepts of Cartography, Remote Sensing and GIS*, Rajesh Publications, New Delhi.
3. Misra, R.P. et al (2014): *Fundamentals of Cartography*, 2<sup>nd</sup> Revised Edition, Concept Publishing Company, New Delhi.
4. Robinson, A.H. et al (2010): *Elements of Cartography*, Wiley India, New Delhi.
5. Saha, P. and Basu, P. (2014): *Advanced Practical Geography*, Books and Allied (P) Ltd., Kolkata
6. Sarkar, Ashis (2015): *Practical Geography – A Systematic Approach*, Orient Black Swan, New Delhi.
7. Singh, L.R. (2006): *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad.
8. Sinha, M.M.P. and Bala, Seema (2021): *Advanced Cartography and Practical Geography*, Rajesh Publications, New Delhi.

### **Additional Readings:**

1. Singh, Gopal (1998): *Map Work and Practical Geography*, 4<sup>th</sup> Edition, Vikash Publishing House, New Delhi.
2. Monkhouse, F.J. and Wilkinson, H.R. (2022): *Maps and Diagrammes*, Alphanumera Publisher, Delhi.

### **List of Essential Major Equipment**

1. Foot Ruler
2. Diagonal Scale
3. Vernier Scale
4. Set Squares

### **Major Laboratory Stores/Consumable Required**

- 1.
- 2.

### **Essential Software (licensed/open source)**

#### **Student Activities**

1. Practical Records

**Manipur University**  
**Academic Level:4.5 and Semester:I**  
**Syllabus for Minor – 1 (Theory)**

|   |  |              |               |                |                  |
|---|--|--------------|---------------|----------------|------------------|
| Nature of Course                                | Minor  |              |               |                |                  |
| Course Code                                     | MNC45GEG101(T) 25  |              |               |                |                  |
| Course Title                                    | Introduction to Geography                                  |              |               |                |                  |
| Course Level                                    | 100  |              |               |                |                  |
| Credit Details                                  | Total Credit   | Lecture/Week | Tutorial/Week | Practical/Week | Total Hours/Week |
|   | 3  | 3            | --            | --             | 3                |
| Course Audience                                 | Students pursuing First Semester Major in other discipline |              |               |                |                  |
| Proposed by (for Non-Core Course)               |  |              |               |                |                  |
| Pre Requisite (if any)                          | Basic knowledge of Geography and Astronomy                 |              |               |                |                  |
| Skill Training Required (if any)                |  |              |               |                |                  |
| Pre Requisite Course Required (if any)          |  |              |               |                |                  |
| Faculty Eligibility and Specialisation (if any) |  |              |               |                |                  |

**Course Objectives:**

1. Understanding the nature of geography.
2. General overview on physical and human dimensions of geography.
3. General overview on applied aspects and trends of geography.

**Course Learning Outcomes:**

Upon completion of the course the learner will be able to:

1. Understand the nature and scope of geography.
2. Understand the physical and human aspects of geography.
3. Understand the career opportunities of geography.
4. Understand the applied aspects of geography and recent trend in geography.

**Detailed Syllabus Content**

| Unit | Unit Name           | Detailed Syllabus  | Credit |
|------|---------------------|--|--------|
| I    | Nature of Geography | Meaning, scope, branches, and approaches of geography; Emergence of geography as a subject; Importance of geography; Place of geography in the classification of science; Geography and other disciplines. | 1      |

|     |  |  |   |
|-----|--|--|---|
| II  | Physical and Human Dimensions of Geography         | Physical Dimension of Geography: Universe, galaxies, solar system and Earth; Shape and size of the Earth; Revolution and rotation of the Earth; The seasons; Age of the Earth; Longitudes, latitudes, and time. The Human Dimension in Geography: Man and Environment; Society, Culture, and Civilization. | 1 |
| III | Modern Concepts in Geography and Applied Geography | Modern concepts in geography; Study of geography in India; Career opportunities for geographers and recent trends in geography. Applied Geography: Definition, necessity, themes, emerging scope, method, and theoretical bases; Challenges and limitations.   | 1 |

### Suggested Readings:

1. Adhikari, Sudepta (2015): Fundamentals of Geographical Thought, Orient Black Swan, New Delhi.
2. Dwivedi, A.K. (2021): Fundamentals of Geography, Vanya Publications, Kanpur.
3. Gregory, Derek et al eds. (2009): The Dictionary of Human Geography, 5th Edition, Wiley BlackWell, Chichester.
4. Jain, Ritu (2018): Fundamentals of Geography, Pratyush Publications, Delhi.
5. Kaushik, Dr. S.D. and Rawat, Dr. D.S. (2018): Geographical Thought and Methodology, Rastogi Publications, Meerut.
6. Khullar, D.R. (2019): Physical Geography, Kalyani Publications, Ludhiana.
7. Husain, Majid (2018): Fundamentals of Physical Geography 5th Edition, Rawat Publications, Jaipur.
8. Leong, Goh Cheng (2020): Certificate Physical and Human Geography, Oxford University Press, New Delhi.
9. Maiti, Ramkrishna and Maiti, Moumita Moitra (2021) Development of Geographical Thought – Contextualisation and Synthesis of Philosophies, Nabodaya Publications, Kolkata.
10. Maurya, Dr. S.D. (2016): History of Geographical Thought, Sharda Pustak Bhawan, Allahabad.
11. Maurya, Dr. S.D. (2016): Cultural Geography, Sharda Pustak Bhawan, Allahabad.
12. Singh, R.P. (2005): Teaching of Geography, R. Lall Book Depot, Meerut.

Note: Internet sources may be used for the areas for which books are not available.

### **Additional Readings:**

1. Bunnett, R. B. and Parihar, Seema Bala (2019): Physical Geography in Diagrams, 4<sup>th</sup> Edition, Pearson Education, Noida.
2. Dasgupta, A.K. and A.N. Kapoor (2004): Principles of Physical Geography, S. Chand and Company, New Delhi.

### **Course Teaching-Learning Process**

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing
- Presentation through Poster and Power Point

Linkage between Programme Learning Outcome (POs) and Course Learning Outcome (COs)

| L   | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2    | 1    | 3    | 0    | 2    | 1    |
| CO2 | 2    | 1    | 3    | 0    | 2    | 1    |
| CO3 | 2    | 1    | 3    | 0    | 2    | 1    |
| CO4 | 2    | 1    | 3    | 0    | 2    | 1    |

3: High, 2: Medium, 1: Low, 0: No Correlation

### **Assessment Methods**

- Written examination
- Close-book and open-book test
- Problem solving exercise
- Individual and group project
- Seminar and presentation
- Interaction session

**Manipur University**  
**Academic Level: 4.5 and Semester: I**  
**Syllabus for Minor-1 (Practical)**

|   |   |              |               |                |                 |
|---|---|--------------|---------------|----------------|-----------------|
| Name of Course                                  | Minor   |              |               |                |                 |
| Course Code                                     | MNC45GEG101(P)25                                    |              |               |                |                 |
| Course Title                                    | Simple Astronomical Calculation and Scale           |              |               |                |                 |
| Course Level                                    | 100   |              |               |                |                 |
| Credit details                                  | Total Credit  | Lecture/Week | Tutorial/Week | Practical/Week | Total Hour/Week |
|   | 1   | --           | --            | 1              | 2               |
| Course Audience                                 | Students pursuing First Semester Major in Geography |              |               |                |                 |
| Associated Theory Course (topics)               | 1. Physical Dimensions of Geography                 |              |               |                |                 |
| Skill Training Required (if any)                |   |              |               |                |                 |
| Pre-Requisite Course Required (if any)          |   |              |               |                |                 |
| Faculty Eligibility and Specialization (if any) |   |              |               |                |                 |

**Course Description:**

1. This course is designed to learn calculation of physical properties of the Earth
2. To facilitate learners to understand how to calculate local time and time of sun rise and sun set.
3. Learner will be able to construct and draw various types of scale.

**Course Learning Outcome:**

Upon completion of the course the learner will be able to:

1. Calculate physical properties of the Earth.
2. Calculate local time and time of sun rise and sun set.
3. Construct and draw various types of scale.

**Details of Syllabus**

| Sl. No. | List of Practical   | No. of Session |
|---------|---|----------------|
| 1       | Measurement of shape and size of the Earth                | 1              |
| 2       | Calculation of radius of the Earth                        | 1              |
| 3       | Calculation of altitudes and declination of stars         | 2              |
| 4       | Determination of time and calculation of local time       | 2              |
| 5       | Calculation of time of sunrise and sunset                 | 2              |
| 6       | Definition, types and methods for representation of scale | 1              |

|   |  |   |
|---|--|---|
| 7 | Construction and drawing of plain, diagonal, comparative and vernier scale | 6 |
|---|--|---|

### **Suggested Readings:**

1. Khullar, D.R. (2016): *Essentials of Practical Geography*, Academic Publishing Co, Jalandhar.
2. Maltiar, K.K. and Maltiar, (Mrs) S.R. (2022): *Concepts of Cartography*, Remote Sensing and GIS, Rajesh Publications, New Delhi.
3. Misra, R.P. et al (2014): *Fundamentals of Cartography*, 2<sup>nd</sup> Revised Edition, Concept Publishing Company, New Delhi.
4. Robinson, A.H. et al (2010): *Elements of Cartography*, Wiley India, New Delhi.
5. Saha, P. and Basu, P. (2014): *Advanced Practical Geography*, Books and Allied (P) Ltd., Kolkata
6. Sarkar, Ashis (2015): *Practical Geography – A Systematic Approach*, Orient Black Swan, New Delhi.
7. Singh, L.R. (2006): *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad.
8. Sinha, M.M.P. and Bala, Seema (2021): *Advanced Cartography and Practical Geography*, Rajesh Publications, New Delhi.

### **Additional Readings:**

1. Singh, Gopal (1998): *Map Work and Practical Geography*, 4<sup>th</sup> Edition, Vikash Publishing House, New Delhi.
2. Monkhouse, F.J. and Wilkinson, H.R. (2022): *Maps and Diagrammes*, Alphanumera Publisher, Delhi.

### **List of Essential Major Equipment**

1. Foot Ruler
2. Diagonal Scale
3. Vernier Scale
4. Set Squares

### **Major Laboratory Stores/Consumable Required**

- 1.
- 2.

### **Essential Software (licensed/open source)**

#### **Student Activities**

1. Practical Records

**Manipur University**  
**Academic Level:4.5 and Semester:I**  
**Syllabus for SEC – 1 (Theory)**

|   |   |              |               |                |                  |
|---|---|--------------|---------------|----------------|------------------|
| Nature of Course                                | SEC   |              |               |                |                  |
| Course Code                                     | SEC45GEG101(T) 25   |              |               |                |                  |
| Course Title                                    | Cartographic Techniques and Computer Application in Geography |              |               |                |                  |
| Course Level                                    |   |              |               |                |                  |
| Credit Details                                  | Total Credit  | Lecture/Week | Tutorial/Week | Practical/Week | Total Hours/Week |
|   | 2   | 2            | --            | --             | 2                |
| Course Audience                                 | Students pursuing First Semester Major in Geography           |              |               |                |                  |
| Proposed by (for Non-Core Courses)              |   |              |               |                |                  |
| Pre Requisite (if any)                          | Students are familiar with map and computer                   |              |               |                |                  |
| Skill Training Required (if any)                |   |              |               |                |                  |
| Pre Requisite Course Required (if any)          |   |              |               |                |                  |
| Faculty Eligibility and Specialisation (if any) |   |              |               |                |                  |

**Course Objectives:**

1. This course is designed to understand the meaning of cartography and computer.
2. Learners will be able to understand how to prepare maps and diagrams.
3. Learners are expected to have a good knowledge of computer in map making.
4. Further, learners will understand the importance of Information Technology in geographical studies.

**Course Learning Outcomes:**

Upon completion of the course the learner will be able to:

1. Understand the nature and scope of cartography.
2. Understand the preparation of maps and diagrams.
3. Understand the computer applications in cartography.
4. Understand the knowledge of information technology.

## Detailed Syllabus Content

| Unit | Unit Name                         | Detailed Syllabus   | Credit |
|------|-----------------------------------|---|--------|
| I    | Cartographic Techniques           | Meaning, scope, and development of cartography; Present status of cartography, cartographic use of the sphere, ellipsoid, and geoid; UTM Coordinates and Geographical coordinates. Meaning and types of maps; Map designs and layout; Mechanics of map construction and map reproduction; Digital cartography – Concept, data models for digital cartographic information and map digitizing.                             | 1      |
| II   | Computer Application in Geography | Definition of computer; Hardware and software for computer mapping; Applications of computer cartography. Representation of Geographic Data by using Relevant Software: Histogram, bar graph, line graph, scatter diagram, and pie diagram. Importance of Information Technology in Geographical Studies: Advantages of internet, browsing and surfing the geographical sites, web pages, portals, and downloading files. | 1      |

### Suggested Readings:

1. International Cartographic Association (1984): Basic Cartography for Students and Technicians, Vol.1.
2. Maltiar, K.K. and Maltiar, (Mrs) S.R. (2022): Concepts of Cartography, Remote Sensing and GIS, Rajesh Publications, New Delhi.
3. Misra, R.P. et al (2014): Fundamentals of Cartography, 2nd Edition, Concept Publishing Company, New Delhi.
4. Robinson, Arthur H. et al (2010): Elements of Cartography, 6th Edition, Wiley India(P) Ltd., New Delhi.
5. Maguire, David J. (1989): Computers in Geography, Longman, London.
6. Mather, Paul M. (1993): Computer Application in Geography, John Wiley & Sons, New York.
7. Monmonier, M.S. (1982): Computer Assisted Cartography, Prentice Hall, Englewood Cliff, New Jersey.
8. Unnwin, D.J. and Dawson, J.A. (1987): Computer Programming for Geographers, Longman, London.

### **Additional Readings:**

1. Internet sources may be used for the areas for which books are not available.

### **Course Teaching-Learning Process**

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing
- Quizzes

Linkage between Programme Learning Outcome (POs) and Course Learning Outcome (COs)

| L   | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO2 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO3 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO4 | 2    | 1    | 0    | 3    | 2    | 1    |

3: High, 2: Medium, 1: Low, 0: No Correlation

### **Assessment Methods**

- Written examination
- Close-book and open-book test
- Problem solving exercise
- Individual and group project
- Seminar and presentation
- Interaction session

**Manipur University**  
**Academic Level: 4.5 and Semester: I**  
**Syllabus for SEC-1 (Practical)**

|   |  |              |               |                |                 |
|---|--|--------------|---------------|----------------|-----------------|
| Name of Course                                  | SEC  |              |               |                |                 |
| Course Code                                     | SEC45GEG101(P)25   |              |               |                |                 |
| Course Title                                    | Cartographic Techniques and Computer Application                   |              |               |                |                 |
| Course Level                                    |  |              |               |                |                 |
| Credit details                                  | Total Credit   | Lecture/Week | Tutorial/Week | Practical/Week | Total Hour/Week |
|   | 1  | --           | --            | 1              | 2               |
| Course Audience                                 | Students pursuing First Semester Major in Geography                |              |               |                |                 |
| Associated Theory Course (Topics)               | 1. Cartographic Techniques<br>2. Computer Application in Geography |              |               |                |                 |
| Skill Training Required (if any)                |  |              |               |                |                 |
| Pre-Requisite Course Required (if any)          |  |              |               |                |                 |
| Faculty Eligibility and Specialization (if any) |  |              |               |                |                 |

**Course Description:**

1. This course is designed to learn manual and digital mapping.
2. Use of information technology in geographical studies.

**Course Learning Outcomes:**

Upon completion of the course the learners will be able to:

1. Digitize geographical data.
2. Operate cartographic software as well as other software related to geographical studies.
3. Prepare maps and diagrams properly using relevant software.

**Detailed Syllabus Content**

| Sl. No | List of practical  | No. of Session |
|--------|--|----------------|
| 1      | Handling of cartographic equipment.  | 1              |
| 2      | Preparation of sphere, ellipsoid and geoid surface using computer software.    | 3              |
| 3      | Conversion of UTM Coordinates to latitude and longitude manually and software. | 3              |
| 4      | Map digitizing.  | 2              |

|   |  |   |
|---|--|---|
| 5 | Preparation of maps and diagrams representing geographic data using relevant software. | 3 |
| 6 | Browsing and surfing the geographical sites, webpages, portals and downloading files.  | 3 |

### **Suggest Readings:**

1. Mather, Paul M. (1993): Computer Application in Geography, John Wiley and Sons, New York.
2. Misra, R.P etal (2014): Fundamentals of Cartography, 2<sup>nd</sup> Edition, Concept Publishing Company, New Delhi.
3. Monmonier, M.S (1982): Computer Assisted Cartography, Practice Hall, Englewood Cliff, New Jersey.
4. Breslin, Prat etal (1998): Getting to Know Arcview GIS, Environmental System Research Institute, USA.

### **Additional Readings:**

1. Monkhouse, F.J. and Wilkinson, H.R. (2022): Maps and Diagrammes, Alphanumera Publisher, Delhi.
2. Internet sources may be used for which books are not available.

### **List of Essential Major Equipment**

1. Cartographic instruments such as foot ruler, set squares, protector, ink bow compass, pencil bow compass, technical compass with universal holder and extension bar, divider, mini drafter, technical pen etc.
2. Computer set with latest version.

### **Major Laboratory Stores/Consumable Required**

1. Technical pen ink.
2. Printer cartridge.
3. High quality glossary paper of various sizes.

### **Essential Software (licensed/open source)**

1. ArcGIS
2. MapInfo
3. Easy Map Maker

### **Student Activities:**

1. Practical Record

**Manipur University**  
**Academic Level:4.5 and Semester:I**  
**Syllabus for MDC – 1 (Theory)**

|   |                                  |               |                |                 |                   |
|---|----------------------------------|---------------|----------------|-----------------|-------------------|
| Nature of Course                                | MDC                              |               |                |                 |                   |
| Course Code                                     | MDC45GEG101(T) 25                |               |                |                 |                   |
| Course Title                                    | Geography of Manipur             |               |                |                 |                   |
| Course Level                                    |                                  |               |                |                 |                   |
| Credit Details                                  | Total Credit                     | Lecture/ Week | Tutorial/ Week | Practical/ Week | Total Hours/ Week |
|   | 3                                | 2             | 1              | --              | 3                 |
| Course Audience                                 | Students pursuing First Semester |               |                |                 |                   |
| Proposed by (for Non-Core Course if any)        |                                  |               |                |                 |                   |
| Pre Requisite (if any)                          |                                  |               |                |                 |                   |
| Skill Training Required (if any)                |                                  |               |                |                 |                   |
| Pre Requisite Course Required (if any)          |                                  |               |                |                 |                   |
| Faculty Eligibility and Specialisation (if any) |                                  |               |                |                 |                   |

**Course Objectives:**

1. Understanding the geographical features of Manipur.
2. General overview on people and demographic dimensions of Manipur.
3. General overview on economic dimensions of Manipur.

**Course Learning Outcomes:**

Upon completion of the course the learner will be able to:

1. Understand the physical aspects of Manipur.
2. Understand the population dynamics of Manipur.
3. Understand the economic dimensions of Manipur.

**Detailed Syllabus Content**

| Unit | Unit Name          | Detailed Syllabus   | Credit |
|------|--------------------|---|--------|
| I    | Land               | Introduction, Physical Features, Drainage, Climate, Soil, Natural Vegetation  | 1      |
| II   | People and Economy | People of Manipur, Population, Settlement, Agriculture, Industries, Transport and Communication, Trade and Commerce | 1      |
| III  | Tutorial           | --  | 1      |

### Suggested Readings:

1. Bhattacharyya, N. N. (2006): Manipur - Land, People and Economy. New Delhi: Rajesh Publications.
2. Laiba, Dr. M.T. (2018): Geography of Manipur, Imphal.
3. Singh, R. P. 1982. Geography of Manipur. New Delhi: National Book Trust.
4. Singh, Th. Nabakumar (2011): Geography of Manipur, New Delhi: Rajesh Publications.

Note: Internet sources may be used for the areas for which books are not available.

### Additional Readings:

1. Johnstone, S.J. (1971): Manipur and the Naga Hills. Delhi: Vivek Publishing House.
2. Gopalkrishnan, R. (1996): The North-East India: Land, Economy and People. New Delhi: Har Anand Publications.

### Course Teaching-Learning Process

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing
- Quizzes

Linkage between Programme Learning Outcome (POs) and Course Learning Outcome (COs)

| L   | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3    | 2    | 1    | 2    | 2    | 0    |
| CO2 | 3    | 2    | 1    | 2    | 2    | 0    |
| CO3 | 3    | 2    | 1    | 2    | 2    | 0    |

3: High, 2: Medium, 1: Low, 0: No Correlation

### Assessment Methods

- Written examination
- Close-book and open-book test
- Problem solving exercise
- Individual and group project
- Seminar and presentation
- Interaction session

**Manipur University**  
**Academic Level: 4.5 and Semester: II**  
**Syllabus for Major - 2 (Theory)**  
**FYUP 2<sup>nd</sup> Semester Geography**

|   |  |               |                |                |                   |
|---|--|---------------|----------------|----------------|-------------------|
| Nature of Course                                | Major  |               |                |                |                   |
| Course Code                                     | MJC45GEG102 (T) 25                                   |               |                |                |                   |
| Course Title                                    | Fundamentals of Physical Geography                   |               |                |                |                   |
| Course Level                                    | 100  |               |                |                |                   |
| Credit Details                                  | Total Credit   | Lecture/ Week | Tutorial/ Week | Practical/Week | Total Hours/ Week |
|   | 3  | 3             | --             | --             | 3                 |
| Course Audience                                 | Students pursuing Second Semester Major in Geography |               |                |                |                   |
| Proposed by (for Non-Core courses)              |  |               |                |                |                   |
| Pre Requisites (if any)                         | Basic knowledge of Geography                         |               |                |                |                   |
| Skill Training Required (if any)                |  |               |                |                |                   |
| Pre-Requisite Course Required (if any)          |  |               |                |                |                   |
| Faculty Eligibility and Specialization (if any) |  |               |                |                |                   |

**Course Objective:**

1. Understanding the nature of physical geography.
2. General overview on geomorphology, climatology, oceanography, hydrology and biogeography.

**Course Learning Outcomes:** Upon completion of the course the learners will be able to

|    |   |
|----|---|
| 1. | Understand the nature and scope of physical geography.  |
| 2. | Understand the physical aspects of geography.   |
| 3. | Understand the relationship between the physical geography and other disciplines.                     |
| 4. | Understand the applications of the principles of physical geography to practical real-world situation |
| 5. | Develop a depth understanding of the processes that drive physical geography                          |

## Detailed Syllabus Content

| Unit | Unit Name                     | Detailed Syllabus   | Credit/Hour |
|------|-------------------------------|---|-------------|
| I    | Nature of Physical Geography  | Meaning, scope, and components of physical geography; Physical geography and other disciplines; Geological Time Scale.  | 9 hrs       |
| II   | Geotectonics                  | Origin and interior of the Earth; Origin of continents and oceans; Isostasy; Earthquakes and volcanoes; Earth movements; Faults, folds, domes, and joints; Continental Drift and Plate Tectonic Theories. | 9 hrs       |
| III  | Geomorphology                 | Minerals and rocks; Weathering and mass wasting; Types of streams; Drainage systems and patterns; Slope elements; Landforms made by river, wind, glacier, underground water, and sea waves.               | 9 hrs       |
| IV   | Climatology                   | Elements of weather and climate; Composition and structure of the atmosphere; Insolation; Planetary wind; Rainfall; Tropical cyclones; Hydrological cycle.  | 9 hrs       |
| V    | Oceanography and Biogeography | Ocean bottom; Temperature, density and salinity of ocean water; Ocean current and deposits; Concept of ecosystem, food chain, carbon cycle and oxygen cycle.  | 9 hrs       |

### *Suggested Readings*

1. Billings, Marland P. (2016): Structural Geology, 3rd Edition, Pearson Education, India, Noida.
2. Holden, Joseph ed. (2017): An Introduction to Physical Geography and the Environment, Pearson Education Ltd., Harlow, UK.
3. Husain, Majid (2018): Fundamentals of Physical Geography, 5th Edition, Rawat Publications, Jaipur.
4. Khullar, D.R. (2019): Physical Geography, Kalyani Publishers, Ludhiana.
5. Lal, D.S. (2014): Physical Geography, Sharda Pustak Bhawan, Allahabad.
6. Siddhartha, K. (2017): Physical Geography, Kitab Mahal, Allahabad.
7. Singh, Savindra (2020): Physical Geography, Prayag Pustak Bhawan, Allahabad.
8. Strahler, Alan (2016): Introducing Physical Geography, Wiley, New York.
9. Tarbuck, Edward J. et al (2016): Earth – An Introduction to Physical Geology, 11th Edition, Pearson Education India, Noida.

### *Additional Readings:*

1. Chaudhuri, Sandipkumar (2018): Fundamentals of Geotectonics, NCBA, Kolkata.
2. Huddart, David and Timstott (2019): Earth Environments, 2<sup>nd</sup> Edition, Wiley Blakwel, Chichester.
3. Patwardhan, A.M. (2020): The Dynamic Earth System, 4<sup>th</sup> Edition, PHI Learning Ltd., New Delhi.

### **Course Teaching-Learning Process**

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing

- Presentation and assignments
- Quizzes

**Linkage between Programme Learning Outcomes (POs) and Course Learning Outcomes (COs)**

|      | PLO1 | PLO2 | PLO3 | PLO4 | PLO4 | PLO5 | PLO6 |  |  |
|------|------|------|------|------|------|------|------|--|--|
| CO1  | 2    | 1    | 3    | 1    | 2    | 1    | 1    |  |  |
| CO2  | 2    | 1    | 3    | 1    | 2    | 1    | 1    |  |  |
| CO3  | 2    | 1    | 3    | 2    | 2    | 1    | 1    |  |  |
| CO4  | 2    | 1    | 3    | 1    | 2    | 1    | 1    |  |  |
| CO5, | 2    | 2    | 1    | 2    | 3    | 2    | 1    |  |  |
|      |      |      |      |      |      |      |      |  |  |
|      |      |      |      |      |      |      |      |  |  |

3: High, 2: Medium, 1: Low, 0: No corelation

**Assessment Methods**

- Written examination
- Seminar and presentation
- Interaction and group discussion
- Quizzes
- Problem solving exercise
- Individual and group project
- Unit Test
- Demonstration

**Manipur University**  
**Academic Level: 4.5 and Semester: II**  
**Syllabus for Major - 2 (Practical)**

|   |   |               |                |                |                   |
|---|---|---------------|----------------|----------------|-------------------|
| Nature of Course                                | Major   |               |                |                |                   |
| Course Code                                     | MJC45GEG102 (P) 25  |               |                |                |                   |
| Course Title                                    | Relief Mapping, Mineral and Rock Identification and Geological Map Interpretation and Field visit |               |                |                |                   |
| Course Level                                    | 100   |               |                |                |                   |
| Credit Details                                  | Total Credit  | Lecture/ Week | Tutorial/ Week | Practical/Week | Total Hours/ Week |
|   | 1   | --            | --             | 1              | 2                 |
| Course Audience                                 | Students pursuing Second Semester Major in Geography  |               |                |                |                   |
| Associated Theory Courses (Topics)              | 1. Physical dimensions of Geography<br>2.<br>3.   |               |                |                |                   |
| Skill Training Required (if any)                | 1.<br>2.  |               |                |                |                   |
| Pre-Requisite Course Required (if any)          | 1.<br>2.  |               |                |                |                   |
| Faculty Eligibility and Specialization (if any) |   |               |                |                |                   |

**Course Description:**

1. This course is designed to learn various methods of showing relief features.
2. To understand the geological structures through geological maps.
3. Learners will have field experiences.

**Course Learning Outcomes:**

Upon completion of the course the learner will be able to:

1. Draw various methods of showing relief features.
2. Draw geological structures from the geological maps.
3. Identify rocks and geological structures in the field.
4. Measure the attitude of the beds in the field.

**Detailed Syllabus Content**

| Sl. No. | List of Practical  | No. of Sessions |
|---------|--|-----------------|
| 1.      | Drawing of hachure, hill shading, contour, formline, and layer tints;  | 1               |
| 2.      | Drawing of contours and their cross section of slope elements, and fluvial, wind, karst, glacial, and coastal landforms. | 2               |
| 3.      | Identification of drainage pattern from the 1:50,000 toposheets.   | 1               |
| 4.      | Identification of minerals and rocks in hand specimen.   | 1               |

|    |  |   |
|----|--|---|
| 5. | Identification of various geological structures from the geological maps.  | 1 |
| 6. | Drawing of strike lines and determination of direction, amount of dip, and thickness of beds.  | 1 |
| 7. | Drawing of geological sections of horizontal, inclined, folded, faulted, unconformity, and complex structures and interpretation of each section.  | 4 |
| 8. | Visit to the hilly area of Manipur with concerned teachers and identify the rocks and structures. Measurement of direction of strike lines, and direction and amount of true dips of folds by using Brunton Compass. | 3 |
| 9. | Preparation of field report.   | 1 |

### ***Suggested Readings***

1. Basu, Partha (2021): Advanced Practical Geography, 4<sup>th</sup> Edition, Books and Allied (P) Ltd., Kolkata.
2. Bennison, George M., Oliver, Paul A. and Moseley, Keith A. (2018): An Introduction to Geological Structures and Maps, 8th Edition, Taylor and Francis Books India Pvt. Ltd., New Delhi.
3. Chadha, S.K. (2020): Elements of Geological Maps for Geology, Geography and Civil Engg., CBS Publishers and Distributors, New Delhi.
4. Gokhale, N.W. (2009): A Guide to Field Geology, CBS Publishers and Distributor, New Delhi.
5. Gokhale, N.W.(2017): Manual of Geological Maps, CBS Publishers and Distributor, New Delhi.
6. Khan, Md. Zulfequar Ahmad (1998): Textbook of Practical Geography, Concept Publishing Company, New Delhi.
7. Khullar, D.R. (2018): Essentials of Practical Geography, New Academic Publishing Co., Jalandhar.
8. Maltman, Alex (2012): Geological Map – An Introduction, Springer, New York.
9. Mathur, S.M. (2001): Guide to Field Geology, Prentice Hall India Learning Pvt. Ltd., New Delhi.
10. Sarkar, Ashis (2015): Practical Geography – A Systematic Approach, Orient Black Swan, New Delhi.
11. Sen, Ajoy Kumar (2005): Laboratory Manual of Geology, Modern Book Agency Private Ltd., Calcutta.
12. Singh,L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
13. Singh R.L. and Singh Rana P.B. (2012): Elements of Practical Geography, Kalyani Publishers, Ludhiana.

### ***Additional Readings:***

1. Kannan, Monika and Yadav, Shilpi (2022): Practical Geography, Rawat Publications, Jaipur.
2. Robinson, Arthur H. et al (2010): Elements of Cartography, 6thEdition, Wiley India, New Delhi.
3. Sen, Ajoy Kumar (2005): Laboratory Manual of Geology, Modern Book Agency Private Ltd., Calcutta.

### **List of Essential Major Equipment**

1. Set squares
2. Brunton Compass

**Major Laboratory Stores/Consumables Required**

1. Trace paper
2. Arithmetic graph paper (inch)

**Essential Software (Licensed/Open-Source)**

1. QGIS
2. Mapmaker
3. Arc GIS

**Student Activities**

1. Practical Record
2. Project Report

**Manipur University**  
**Academic Level: 4.5 and Semester: II**  
**Syllabus for Minor - 2 (Theory)**

|   |  |               |                |                |                   |
|---|--|---------------|----------------|----------------|-------------------|
| Nature of Course                                | Minor  |               |                |                |                   |
| Course Code                                     | MNC45GEG102 (T) 25   |               |                |                |                   |
| Course Title                                    | Introduction to Physical Geography                           |               |                |                |                   |
| Course Level                                    | 100  |               |                |                |                   |
| Credit Details                                  | Total Credit   | Lecture/ Week | Tutorial/ Week | Practical/Week | Total Hours/ Week |
|   | 3  | 3             | --             | --             | 3                 |
| Course Audience                                 | Students pursuing Second Semester Major other than Geography |               |                |                |                   |
| Proposed by (for Non-Core courses)              |  |               |                |                |                   |
| Pre Requisites (if any)                         | Basic knowledge of Geography                                 |               |                |                |                   |
| Skill Training Required (if any)                |  |               |                |                |                   |
| Pre-Requisite Course Required (if any)          |  |               |                |                |                   |
| Faculty Eligibility and Specialization (if any) |  |               |                |                |                   |

**Course Objective:**

3. Understanding the nature of physical geography.
4. General overview on geomorphology, climatology, oceanography, hydrology and biogeography.

**Course Learning Outcomes:** Upon completion of the course the learners will be able to

|    |   |
|----|---|
| 1. | Understand the nature and scope of physical geography.  |
| 2. | Understand the physical aspects of geography.   |
| 3. | Understand the relationship between the physical geography and other disciplines.                     |
| 4. | Understand the applications of the principles of physical geography to practical real world situation |
| 5. | Develop a depth understanding of the processes that drive physical geography                          |

## Detailed Syllabus Content

| Unit | Unit Name                     | Detailed Syllabus   | Credit/Hour |
|------|-------------------------------|---|-------------|
| I    | Nature of Physical Geography  | Meaning, scope, and components of physical geography; Physical geography and other disciplines; Geological Time Scale.  | 9 hrs       |
| II   | Geotectonics                  | Origin and interior of the Earth; Origin of continents and oceans; Isostasy; Earthquakes and volcanoes; Earth movements; Faults, folds, domes, and joints; Continental Drift and Plate Tectonic Theories. | 9 hrs       |
| III  | Geomorphology                 | Minerals and rocks; Weathering and mass wasting; Types of streams; Drainage systems and patterns; Slope elements; Landforms made by river, wind, glacier, underground water, and sea waves.               | 9 hrs       |
| IV   | Climatology                   | Elements of weather and climate; Composition and structure of the atmosphere; Insolation; Planetary wind; Rainfall; Tropical cyclones; Hydrological cycle.  | 9 hrs       |
| V    | Oceanography and Biogeography | Ocean bottom; Temperature, density and salinity of ocean water; Ocean current and deposits; Concept of ecosystem, food chain, carbon cycle and oxygen cycle.  | 9 hrs       |

### *Suggested Readings*

10. Billings, Marland P. (2016): Structural Geology, 3rd Edition, Pearson Education, India, Noida.
11. Holden, Joseph ed. (2017): An Introduction to Physical Geography and the Environment, Pearson Education Ltd., Harlow, UK.
12. Husain, Majid (2018): Fundamentals of Physical Geography, 5th Edition, Rawat Publications, Jaipur.
13. Khullar, D.R. (2019): Physical Geography, Kalyani Publishers, Ludhiana.
14. Lal, D.S. (2014): Physical Geography, Sharda Pustak Bhawan, Allahabad.
15. Siddhartha, K. (2017): Physical Geography, Kitab Mahal, Allahabad.
16. Singh, Savindra (2020): Physical Geography, Prayag Pustak Bhawan, Allahabad.
17. Strahler, Alan (2016): Introducing Physical Geography, Wiley, New York.
18. Tarbuck, Edward J. et al (2016): Earth – An Introduction to Physical Geology, 11th Edition, Pearson Education India, Noida.

### *Additional Readings:*

4. Chaudhuri, Sandipkumar (2018): Fundamentals of Geotectonics, NCBA, Kolkata.
5. Huddart, David and Timstott (2019): Earth Environments, 2<sup>nd</sup> Edition, Wiley Blackwel, Chichester.
6. Patwardhan, A.M. (2020): The Dynamic Earth System, 4<sup>th</sup> Edition, PHI Learning Ltd., New Delhi.

### **Course Teaching-Learning Process**

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing
- Presentation and assignments

- Quizzes

**Linkage between Programme Learning Outcomes (POs) and Course Learning Outcomes (COs)**

|      | PLO1 | PLO2 | PLO3 | PLO4 | PLO4 | PLO5 | PLO6 |  |  |
|------|------|------|------|------|------|------|------|--|--|
| CO1  | 2    | 1    | 3    | 1    | 2    | 1    | 1    |  |  |
| CO2  | 2    | 1    | 3    | 1    | 2    | 1    | 1    |  |  |
| CO3  | 2    | 1    | 3    | 2    | 2    | 1    | 1    |  |  |
| CO4  | 2    | 1    | 3    | 1    | 2    | 1    | 1    |  |  |
| CO5, | 2    | 2    | 1    | 2    | 3    | 2    | 1    |  |  |
|      |      |      |      |      |      |      |      |  |  |
|      |      |      |      |      |      |      |      |  |  |

3: High, 2: Medium, 1: Low, 0: No correlation

**Assessment Methods**

- Written examination
- Seminar and presentation
- Interaction and group discussion
- Quizzes
- Problem solving exercise
- Individual and group project
- Unit Test
- Demonstration

**Manipur University**  
**Academic Level: 4.5 and Semester: II**  
**Syllabus for Minor – 2 (Practical)**

|   |   |               |                |                |                   |
|---|---|---------------|----------------|----------------|-------------------|
| Nature of Course                                | Minor   |               |                |                |                   |
| Course Code                                     | MNC45GEG102 (P) 25  |               |                |                |                   |
| Course Title                                    | Relief Mapping, Mineral and Rock Identification and Geological Map Interpretation and Field visit |               |                |                |                   |
| Course Level                                    | 100   |               |                |                |                   |
| Credit Details                                  | Total Credit  | Lecture/ Week | Tutorial/ Week | Practical/Week | Total Hours/ Week |
|   | 1   | --            | --             | 1              | 2                 |
| Course Audience                                 | Students pursuing Second Semester Major other than Geography                                      |               |                |                |                   |
| Associated Theory Courses (Topics)              | 1. Physical dimensions of Geography<br>2.<br>3.   |               |                |                |                   |
| Skill Training Required (if any)                | 1.<br>2.  |               |                |                |                   |
| Pre-Requisite Course Required (if any)          | 1.<br>2.  |               |                |                |                   |
| Faculty Eligibility and Specialization (if any) |   |               |                |                |                   |

**Course Description:**

4. This course is designed to learn various methods of showing relief features.
5. To understand the geological structures through geological maps.
6. Learners will have field experiences.

**Course Learning Outcomes:**

Upon completion of the course the learner will be able to:

5. Draw various methods of showing relief features.
6. Draw geological structures from the geological maps.
7. Identify rocks and geological structures in the field.
8. Measure the attitude of the beds in the field.

**Detailed Syllabus Content**

| Sl. No. | List of Practical  | No. of Sessions |
|---------|--|-----------------|
| 1.      | Drawing of hachure, hill shading, contour, formline, and layer tints;  | 1               |
| 2.      | Drawing of contours and their cross section of slope elements, and fluvial, wind, karst, glacial, and coastal landforms. | 2               |
| 3.      | Identification of drainage pattern from the 1:50,000 toposheets.   | 1               |
| 4.      | Identification of minerals and rocks in hand specimen.   | 1               |

|    |  |   |
|----|--|---|
| 5. | Identification of various geological structures from the geological maps.  | 1 |
| 6. | Drawing of strike lines and determination of direction, amount of dip, and thickness of beds.  | 1 |
| 7. | Drawing of geological sections of horizontal, inclined, folded, faulted, unconformity, and complex structures and interpretation of each section.  | 4 |
| 8. | Visit to the hilly area of Manipur with concerned teachers and identify the rocks and structures. Measurement of direction of strike lines, and direction and amount of true dips of folds by using Brunton Compass. | 3 |
| 9. | Preparation of field report.   | 1 |

### ***Suggested Readings***

14. Basu, Partha (2021): Advanced Practical Geography, 4<sup>th</sup> Edition, Books and Allied (P) Ltd., Kolkata.
15. Bennison, George M., Oliver, Paul A. and Moseley, Keith A. (2018): An Introduction to Geological Structures and Maps, 8th Edition, Taylor and Francis Books India Pvt. Ltd., New Delhi.
16. Chadha, S.K. (2020): Elements of Geological Maps for Geology, Geography and Civil Engg., CBS Publishers and Distributors, New Delhi.
17. Gokhale, N.W. (2009): A Guide to Field Geology, CBS Publishers and Distributor, New Delhi.
18. Gokhale, N.W.(2017): Manual of Geological Maps, CBS Publishers and Distributor, New Delhi.
19. Khan, Md. Zulfequar Ahmad (1998): Textbook of Practical Geography, Concept Publishing Company, New Delhi.
20. Khullar, D.R. (2018): Essentials of Practical Geography, New Academic Publishing Co., Jalandhar.
21. Maltman, Alex (2012): Geological Map – An Introduction, Springer, New York.
22. Mathur, S.M. (2001): Guide to Field Geology, Prentice Hall India Learning Pvt. Ltd., New Delhi.
23. Sarkar, Ashis (2015): Practical Geography – A Systematic Approach, Orient Black Swan, New Delhi.
24. Sen, Ajoy Kumar (2005): Laboratory Manual of Geology, Modern Book Agency Private Ltd., Calcutta.
25. Singh,L.R. (2006): Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad.
26. Singh R.L. and Singh Rana P.B. (2012): Elements of Practical Geography, Kalyani Publishers, Ludhiana.

### ***Additional Readings:***

4. Kannan, Monika and Yadav, Shilpi (2022): Practical Geography, Rawat Publications, Jaipur.
5. Robinson, Arthur H. et al (2010): Elements of Cartography, 6thEdition, Wiley India, New Delhi.
6. Sen, Ajoy Kumar (2005): Laboratory Manual of Geology, Modern Book Agency Private Ltd., Calcutta.

### **List of Essential Major Equipment**

1. Set squares
2. Brunton Compass

**Major Laboratory Stores/Consumables Required**

1. Trace paper
2. Arithmetic graph paper (inch)

**Essential Software (Licensed/Open-Source)**

1. QGIS
2. Mapmaker
3. ArsGIS

**Student Activities**

1. Practical Record
2. Project Report

## Manipur University

**Academic Level:4.5 and Semester: II**

### Syllabus for MDC – 2 (T)

|   |                                   |              |               |                |                  |
|---|-----------------------------------|--------------|---------------|----------------|------------------|
| Nature of Course                                | MDC                               |              |               |                |                  |
| Course Code                                     | MDC45GEG102 (T) 25                |              |               |                |                  |
| Course Title                                    | Geography of India                |              |               |                |                  |
| Course Level                                    |                                   |              |               |                |                  |
| Credit Details                                  | Total Credit                      | Lecture/Week | Tutorial/Week | Practical/Week | Total Hours/Week |
|   | 3                                 | 2            | 1             | --             | 3                |
| Course Audience                                 | Students pursuing Second Semester |              |               |                |                  |
| Proposed by (for Non-Core Course if any)        |                                   |              |               |                |                  |
| Pre Requisite (if any)                          |                                   |              |               |                |                  |
| Skill Training Required (if any)                |                                   |              |               |                |                  |
| Pre Requisite Course Required (if any)          |                                   |              |               |                |                  |
| Faculty Eligibility and Specialisation (if any) |                                   |              |               |                |                  |

#### Course Objective:

5. Understanding the geographical features of India.
6. General overview on people and demographic dimensions of India.
7. General overview on economic dimensions of India.

#### Course Learning Outcome:

Upon completion of the course the learner will be able to:

1. Understand the physical aspects of India.
2. Understand the population dynamics of India.
3. Understand the economic dimensions of India.

#### Detailed Syllabus Content

| Unit | Unit Name              | Detailed Syllabus   | Credit/Hour |
|------|------------------------|---|-------------|
| I    | Physical Setting       | Location, Physiographic Divisions, Drainage, Climate, Soil, and Natural vegetation.   | 9 hrs       |
| II   | Population             | Distribution, Density, Growth; Composition (Race, Caste, Religion, Language, and Tribes).   | 9 hrs       |
| III  | Mineral Resources      | Metallic (Iron, Manganese, Copper, Bauxite, Lead, Zinc, Tungsten, Gold and Silver) and Non-Metallic (Mica, Limestone, Gypsum, Diamond and Atomic Minerals). | 9 hrs       |
| IV   | Agriculture            | Production and Distribution of Rice, Wheat, Maize, Millets, Cotton, Jute, Sugarcane, Tea, Coffee and Rubber.  | 9 hrs       |
| V    | Industry and Transport | Iron and Steel, Textiles, Automobile,   | 9 hrs       |

|  |  |   |  |
|--|--|---|--|
|  |  | Information Technology; Transport system (Railways, Roadways, Air Transport, Inland Waterways) and Major Ports. |  |
|--|--|---|--|

### Suggested Readings:

1. Chatterjee, Rupali (2018): Geography of India, 2<sup>nd</sup> Edition, Global Vision Publishers House, New Delhi.
2. Khullar, D.R. (2018): India – A Comprehensive Geography, Kalyani Publishers, Ludhiana.
3. Gautam, Alka (2015): Advanced Geography of India, Sharda Pustak Bhawan, Allahabad.
4. Saxena, Pallavi (2025): Majid Husain’s Geography of India, Mc Graw Hill, New Delhi.
5. Sharma, T.C. (2013): Economic Geography of India, Rawat Publications, Jaipur.
6. Singh, Jagdish (2003): India – A Comprehensive & Systematic Geography, Gyanadaya Prakashan, Gorakhpur.
7. Singh, R.L. (ed.) (1971) India: A Regional Geography, National Geographical Society of India, Varanasi.
8. Tiwari R.C. (2019): Geography of India, Pravalika Publications, Allahabad.

### Additional Readings:

1. Gopal Krishan (2017) The Vitality of India: A Regional Perspective, Rawat Publication, Jaipur.
2. Singh, Gopal (2010) Geography of India, Atma Ram and Sons.

### Course Teaching-Learning Process

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing
- Quizzes

Linkage between Programme Learning Outcome (POs) and Course Learning Outcome (COs)

| L   | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 |
|-----|------|------|------|------|------|------|
| CO1 | 3    | 2    | 1    | 2    | 2    | 0    |
| CO2 | 3    | 2    | 1    | 2    | 2    | 0    |
| CO3 | 3    | 2    | 1    | 2    | 2    | 0    |

3: High, 2: Medium, 1: Low, 0: No Correlation

### Assessment Methods

- Written examination
- Close-book and open-book test
- Problem solving exercise
- Individual and group project
- Seminar and presentation
- Interaction session

**Manipur University**  
**Academic Level:4.5 and Semester: II**  
**Syllabus for SEC – 2 (Theory)**

|   |  |              |               |                |                  |
|---|--|--------------|---------------|----------------|------------------|
| Nature of Course                                | SEC  |              |               |                |                  |
| Course Code                                     | SEC45GEG102 (T) 25                                   |              |               |                |                  |
| Course Title                                    | Geographical Information System                      |              |               |                |                  |
| Course Level                                    |  |              |               |                |                  |
| Credit Details                                  | Total Credit   | Lecture/Week | Tutorial/Week | Practical/Week | Total Hours/Week |
|   | 2  | 2            | --            | --             | 2                |
| Course Audience                                 | Students pursuing Second Semester Major in Geography |              |               |                |                  |
| Proposed by (for Non-Core Courses)              |  |              |               |                |                  |
| Pre Requisite (if any)                          | Students familiar with computer                      |              |               |                |                  |
| Skill Training Required (if any)                |  |              |               |                |                  |
| Pre Requisite Course Required (if any)          |  |              |               |                |                  |
| Faculty Eligibility and Specialisation (if any) |  |              |               |                |                  |

**Course Objective:**

8. This course is designed to understand the basic concept of GIS.
9. Analysis and application of geographical data, resource management, land use study through GIS.
10. It seeks to develop new insights among students on the relevant of geographical studies within the field of geography.

**Course Learning Outcome:**

Upon completion of the course the learner will be able to:

4. Understand the nature and scope of GIS.
5. Understand the reparation of geographical data through GIS.
6. Understand the GIS data structure.
7. Understand the GIS data analysis.
8. Understand the application of GIS in various field.
9. Understand the future of GIS.

## Detailed Syllabus Content

| Unit | Unit Name                                       | Detailed Syllabus   | Credit/Hour |
|------|---|---|-------------|
| I    | Nature of GIS                                   | Geographical Information System (GIS): Definition, components, Function and historical development; Definition and need of Land Information System. (LIS), Future of GIS; GIS in India. | 6 hrs       |
| II   | Merits, Demerits and Representation of GIS Data | Advantages and disadvantages of GIS; Representation of geographical data; Converting the geospatial data.   | 6 hrs       |
| III  | GIS Data Structure                              | GIS Data Structure: Types (spatial and non-spatial), raster and vector data structure.  | 6 hrs       |
| IV   | GIS Data Analysis                               | GIS Data Analysis: Input; Geo-referencing; Editing, output, and query; Overlays.  | 6 hrs       |
| V    | GIS Application                                 | Application of GIS: Landuse mapping, urban sprawl analysis, forest monitoring, thematic map, DEM and natural disasters.   | 6 hrs       |

### Suggested Readings:

1. Bhatta, B. (2010): Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin.
2. Bolstad, Paul (2022): GIS Fundamentals – A First Text on Geographic Information System, 7<sup>th</sup> Edition, Eider Press, MN.
3. Burrough, P.A. and McDonnell, R.A. (2000): Principles of Geographical Information System – Spatial Information System and Geo-statistics, Oxford University Press, Oxford.
4. Chang, Kang-tsung (2015): Introduction to Geographic Information System, 8<sup>th</sup> Edition, McGraw Hill, New York.
5. Demers, Michael N. (2012): Fundamentals of Geographic Information System, 4<sup>th</sup> Edition, Wiley India, New Delhi.
6. Fazal, Shahab (2023): GIS Basics, 2<sup>nd</sup> Edition, New Age International Publishers, New Delhi.
7. Garg, P.K. (2019): Principles and Theory of Geoinformatics, Khanna Book Publishing Co. (P) Ltd., New Delhi.
8. Gomasca, M. A. (2009); Basics of Geomatic, Springer Science, New York.
9. Heywoods, I, Cornelius, Sand Carver, S. (2011): An Introduction to Geographical Information System, Prentice Hall, Upper Saddle River, NJ.
10. Nag, P. (2008): Introduction to GIS, Concept Publishing Company Pvt. Ltd., New Delhi.

### Additional Readings:

1. Das, Chandan Surabhi and Mallick, Debojyoti (2020): Geospatial Techniques and Research in Geography, Enova Publications, Kolkata
2. Maltiar, K.K and Maltiar (Mrs) S.R. (2022): Concepts of Cartography, Remote Sensing and GIS, Rajesh Publications, New Delhi.

3. Misra R.P. et al (2014): Fundamentals of Cartography, 2nd Edition, Concept Publishing Company Pvt. Ltd., New Delhi.
4. Sarkar, A (2015): Practical Geography – A Systematic Approach, 3rd Edition, Orient Black Swan Pvt. Ltd., New Delhi.
5. Internet sources may be used for the areas for which books are not available.

### Course Teaching-Learning Process

The important relevant teaching and learning processes involved in this course are –

- Class lectures
- Seminar
- Group discussion and workshop
- Question Framing
- Quizzes

Linkage between Programme Learning Outcome (POs) and Course Learning Outcome (COs)

| L   | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 |
|-----|------|------|------|------|------|------|
| CO1 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO2 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO3 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO4 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO5 | 2    | 1    | 0    | 3    | 2    | 1    |
| CO6 | 2    | 1    | 0    | 3    | 2    | 1    |

3: High, 2: Medium, 1: Low, 0: No Correlation

### Assessment Methods

- Written examination
- Close-book and open-book test
- Problem solving exercise
- Individual and group project
- Seminar and presentation
- Interaction session

**Manipur University**

**Academic Level: 4.5 and Semester: II**

**Syllabus for SEC – 2 (Practical)**

|   |  |              |               |                |                  |
|---|--|--------------|---------------|----------------|------------------|
| Nature of Course                                | SEC  |              |               |                |                  |
| Course Code                                     | SEC45GEG102(P)25                                     |              |               |                |                  |
| Course Title                                    | GIS Practical  |              |               |                |                  |
| Course Level                                    |  |              |               |                |                  |
| Credit Details                                  | Total Credit   | Lecture/Week | Tutorial/Week | Practical/Week | Total Hours/Week |
|   | 1  | --           | --            | 1              | 2                |
| Course Audience                                 | Students pursuing Second Semester Major in Geography |              |               |                |                  |
| Associated Theory Courses (Topics)              | Geographic Information System                        |              |               |                |                  |
| Skill Training Required (if any)                | Computer Knowledge                                   |              |               |                |                  |
| Pre-Requisite Course Required (if any)          | Students familiar with computer                      |              |               |                |                  |
| Faculty Eligibility and Specialization (if any) |  |              |               |                |                  |

**Course Description:**

1. This course is designed to learn handling of GIS software.
2. To facilitate learners to understand how to make maps through GIS software.
3. Learners will be able to create various Geo-information through GIS.

**Course Learning Outcomes:** Upon completion of the course the learners will be able to

|    |   |
|----|---|
| 1. | Understand the basic of GIS software.   |
| 2. | Learn the process of adding supported raster and vector data sets into GIS software.                            |
| 3. | Acquire the knowledge and skills necessary to apply georeferencing to topographic sheets and satellite imagery. |
| 4. | Generating digital data base using GIS tools through the process of digitizing.                                 |
| 5. | Prepare maps and models through GIS software.   |

## Detailed Syllabus Content

| Sl. No. | List of Practical   | No. of Sessions |
|---------|---|-----------------|
| 1.      | Introduction to GIS Software – Arc GIS, ERDAS, QGIS, Arc Map.   | 1               |
| 2.      | Add Data (Toposheet and satellite imagery into GIS software).   | 1               |
| 3.      | Georeferencing Maps and Images, Projections and Datum.  | 1               |
| 4.      | Digitization and Modifications: Point, Line and Polygon.  | 1               |
| 5.      | Attribute Data: Attribute Tables, Editing, Joining and Calculating Fields                             | 2               |
| 6.      | Basic Data Processing and Management: Subset/Clipping, Mosaic, Converting Raster Data to Vector Data. | 1               |
| 7.      | Preparation of thematic maps  | 2               |
| 8.      | Land use mapping  | 2               |
| 9.      | Developing DEM  | 1               |
| 10.     | Overlaying  | 1               |
| 11.     | Landslide hazard zonation   | 2               |

### *Suggested Readings*

1. Appiah Adjei, E.K. (2021): GIS Applications, Kwame Nkrumah University of Science and Technology.
2. Boro, Dr. Anil (2021): Handbook of Practical Remote Sensing, GIS and GPS, EBH Publishers Guwahati.
3. Kalika, Nilotpal and Ashok Kumar Bora (2025): Geoinformatics – Theory and Practice, EBH Publishers Guwahati.
4. Nair Sreeja S. (2012): Geoinformatics Applications in Disaster Management, National Institute of Disaster Management, Ministry of Home Affairs, Govt. of India, New Delhi.
5. Shridhar, Parupalli et al (2025): A Practitioners Approach to Geographical Information System, BS Publications, Hyderabad.

### *Additional Readings:*

1. Basu, Partha (2021): Advanced Practical Geography, 4<sup>th</sup> Edition, Books and Allied (P) Ltd., Kolkata.
2. Das, Chandan Surabhi and Debajyoti Mallick (2024): Geospatial Techniques and Research in Geography, Spellbound Publishers & Distributors, Kolkata.
3. Manugula, Dr. S.S. and Dr. Veeranna Bommakanti (2017): Photogrammetry, GIS and Remote Sensing, Educreation Publishing, Bilaspur.
4. Internet sources may be used for the areas for which books are not available.

### **List of Essential Major Equipment**

1. Compute Sets

### **Major Laboratory Stores/Consumables Required**

1. High quality paper

### **Essential Software (Licensed/Open-Source)**

1. Arc GIS,
2. QGIS,
3. Arc Map,
4. ERDAS.

### **Student Activities**

1. Practical Record Book