Course title: **Geographic Techniques** Full Marks: 100

Course No: Geo. Ed. 446 Pass Marks: T35%+P40%

Nature of the course: Theory (50 %) and Practical (50 %) Periods per week: 9

Level: B.Ed. Total Periods: 225

Year: Fourth [Th.75 period + (Pr. 75 lab) (1 lab =2 period)] Time per period: 55 minutes

1. **Course Description**

This is a specialization course designed for the students of Four Year B. Ed. Program. This course is designed to orient the students to provide knowledge and skills of cartography, surveying, field study and quantitative techniques. It deals with the reading, making and interpretation of different types of map and diagram. Fundamental concepts of instrumental surveying for mapping with the help of survey instruments will cover in the surveying. It intends to enable the students to collect data/information, analyze them and prepare field report based on the field work. In addition, this course is designed to provide knowledge and skills of statistical techniques applied in data analysis related to geography education.

1. **General Objectives**

The general objectives of this course are to:

* Enable the students in interpreting different types of maps.
* Enable the students about the skills in using cartographic techniques in preparing maps and diagrams.
* Acquaint the students with the skills of surveying an area with the help of different surveying instruments and preparing map.
* Make the students familiar with different quantitative techniques.
* Familiarize the students in collecting data from the field, analyzing and interpreting them by using quantitative techniques and preparing field report

1. **Specific Objectives and Contents**

**Part I: Cartography**

|  |  |  |
| --- | --- | --- |
| **Specific Objectives** | **Contents** | |
| * + Define cartography and explain its development   + Describe the difference between analogue and digital cartography   + Describe the meaning, importance, elements and types of map   + Interpret different types of maps, aerial photographs and satellite imageries | **Unit I: Introduction to Cartography and Map Study (15P)**   * 1. Definition and development of cartography   2. Concept of digital and analog cartography   3. Concept of scale and its application in the map   4. Map study      1. Meaning      2. Importance      3. Elements of map      4. Types of map   5. Interpretation of maps      1. Large scale general map (Topographical)      2. Large scale thematic map (Cadastral)      3. Small scale general map (wall map)      4. Small scale thematic maps      5. Picture (panoramic photographs), Aerial photographs and satellite imagery | |
| * + Define diagrams and identify types of diagrams on the basis of dimension   + Represent statistical data using one, two and three-dimensional diagrams   + Interpret climatic and flow data   + Represent statistical data on map | **Unit II: Representation of data (25Lab)**   * 1. Concept of diagrams and its dimensions   2. Construction of graphs and diagrams      1. Bar: Simple and Multiple      2. Wheel/pie: Simple and Stack      3. Line Graph      4. Ring      5. Rectangular      6. Block-pile      7. Spherical      8. Pyramidical diagrams      9. Climograph      10. Hythergraph      11. Flow charts   3. Preparation of distribution maps using isopleths, choropleths, unitary dot, and diagrammatic methods. | |
| * + Reproduce map on the basis of given map.   + Measure and calculate the area and distance on map.   + Introduce different types of projection. | **Unit III: Reproduction of Map (15 Lab)**   * 1. Enlargement and reduction of maps   2. Measurement of area and distance on map   3. Map projection- Azimuthal, Conical   Cylindrical   * Mercator projection   + - Polar projection     - Zenithal projection     - Conical projection | |
| **Part II: Instrumental Surveying** | | |
| * + Describe the meaning of surveying   + Describe the importance of instrumental surveying   + Identify and handle different surveying instruments   + Survey an area using different instruments   + Prepare a map of assigned area   + Introduce the GPS | | **Unit IV: Instrumental Surveying (20 Lab)**   * 1. Introduction of instrumental surveying   2. Importance of instrumental surveying   3. Plane table   4. Abney level   5. Prismatic compass   6. Introduction to Global Positioning System (GPS) |
| **Part III: Field Study** | | |
| * + Explain the concept and meaning of field study   + Describe the objectives of field study in geography   + Discuss the importance of field study in geography   + Describe the different steps of field study   + Prepare tools for data collection   + Administer different tools and collect various types of data   + Edit, process and analyze the collected data   + Prepare a field report | | **Unit V: Field Study \* (15 Lab)**  5.1 Concept and meaning of field study in  geography  5.2 Objectives of field study  5.3 Importance of field study  5.4 Field study  5.4.1 Planning for field study  5.4.2 Preparation of tools  5.4.3 Data collection  5.4.4 Data processing, analysis and  interpretation  5.5 Report writing |
| **Part IV: Quantitative Techniques** | | |
| * + Differentiate types of data.   + Explain different scales of measurement.   + Identify simple descriptive statistics and analyze data using them.   + Calculate the correlation between variables. | | **Unit VI: Introduction to quantitative techniques (60 P)**   * 1. Types of data      1. Primary and secondary data      2. Univariate, bivariate and multivariate data   2. Scale of measurement      1. Nominal      2. Ordinal      3. Interval      4. Ratio   3. Measures of central tendency   6.3.1 Non-spatial data   * + - Mean     - Median     - Mode     - Geometric mean     - Harmonic mean     1. Spatial data     - Mean centre     - Median centre     - Modal centre     - Harmonic mean centre   1. Measures of dispersion      1. Non-spatial data      + Range      + Quartiles      + Mean deviation      + Standard deviation      + Variance and Coefficient of variation      1. Spatial data      + Mean convergence distance      + Standard distance deviation   2. Correlation      1. Scatter diagram      2. Product moment correlation      3. Rank order correlation |

*Note: The figures within the parentheses indicate the approximate periods for respective units.*

*\** ***Requirements***

*The duration of field survey shall be at least of 7 days in any location of adjacent districts of the concerned campus decided by the department.*

* *The students have to compulsorily participate in the field study organized by the Campus/Department.*
* *Students must submit the practical record book and excursion report to the Campus/Department before practical examination.*
* *Students must submit excursion report individually. The report should contain sufficient tables, diagrams and maps and it should be computer typed (at least 15 pages) in a standard format.*

**4. Instructional Techniques**

Two groups of instructional techniques have been recommended. The first group comprises common techniques applicable to most of the unit. The second group includes such instructional techniques which should be applied to teach specific unit.

**4.1 General Instructional Techniques**

* Lecture, discussion, question-answer, brain storming, preparation and presentation of papers in selected topics
* Assignment for preparing some maps, charts and diagrams associated with educational and geographical data.

**4.2 Specific Instructional Techniques**

|  |  |
| --- | --- |
| Unit | Instructional techniques |
| I | Explain the development trend of cartography using inquiry method.  Explain the meaning, importance, elements and types of map. |
| II | Preparation of different thematic maps from aerial photographs and satellite imageries.  Lab work (handling of drawing equipments and construction of charts and diagrams) |
| III | Reproduction of map on the basis of given map. |
| IV | Handling and operation of various survey instruments/equipments and lab work including calculation and plotting of recorded data. |
| V | Develop field techniques, collect relevant data and prepare report by processing and analyzing collected data. |
| VI | Familiarize statisticspresenting and solving relevant problems in the class. Make repeated exercise and presentation in the class. |

**5. Evaluation**

**5.1 Evaluation scheme for theory examination**

The performance of the students will be evaluated by the annual examination to be held by the Office of the Controller of Examinations. Questions are to be developed from all part of the contents. The types and number of questions to be asked in the annual examination are mentioned below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Types of questions** | **Total questions**  **to be asked** | **Number of questions**  **to be answered and marks allocated** | **Total marks** |
| Group A: Multiple choice items | 10 questions | 10 x 1 mark | 10 |
| Group B: Short answer questions | 6 with 2 'or' questions | 6 x 5 marks | 30 |
| Group C: Long answer questions | 1 question | 1 x 10 marks | 10 |

**5.2 Evaluation Scheme for Practical Examination**

There will be a practical examination of three hour duration. Distribution of marks is as follows:

|  |  |  |
| --- | --- | --- |
| SN | Description | Full Marks |
| 1 | Written examination(questions should be developed from all parts) | 20 |
| 2 | Field report | 10 |
| 3 | Practical record book | 10 |
| 4 | Viva-voce | 10 |
|  | **Total** | **50** |

Students need to acquire minimum pass mark in each component (5.1 and 5.2) individually for the completion of the course.

1. **Recommended Books and References**

**Recommended Books**

Bhandari, B. H. (2047 B.S.). *Simple practical geography (in Nepali).* Katmandu: Ratna Pustak Bhandar. (Units I-III ).

Bhatta, B. D.& Baral, C. K. (1998). *Quantitative geography.* Katmandu: Vidyarthi Pustak Bhandar. (Unit VI).

Pla, S. K. (1992). *Statistical techniques: A basic approach of geography.* New Delhi: Tata McGraw-Hill Publishing Company Limited. (Unit VI).

Punima, B. C. & Jain, A. K. (1994). *Surveying (Volume one).* New Delhi: Laxmi Publication. (Unit V and VI).

Rijal, S.R. (2016). Basic Statistics for Geographer, Kathmandu: Rhino Publication Pvt. Ltd. (Unit II & VI)

Singh, G. (1996). *Map work and practical geography.* New Delhi: Vikash Publishing House Private Limited. (Units I & II).

Singh, R. L. & Singh, P. B. (1993).  *Elements of practical geography.* New Delhi: Kalyani Publisher. (Units I-IV).

**References**

Dhakal, K. R. (2067BS).e"uf]n lzIf0fdf ef}uf]lns e|d0f Ps ljZn]if0f, *N. R. Awaz*, 1 (1).

Gupta, S. P. (1987). *Statistical methods.* New Delhi: Sultan Chand and Sons.

Jnawali, D. Poudel, K.P. Rijal, S. P. Dhakal. K. R. Awasthi, T. P. and Sigdel, T. P. (2014). Geography Education in Nepal: A Study of Status and Challenges. A Research Report submitted in University Grants Commission.

Monkhouse, F. J. & Wilkinson, H. R. (1994). *Maps and diagram.* New Delhi: B. I. Publication Private Limited.

Poudel, P. C. & Poudel, R. C. (1995). *Practical geography (in nepali).* Katmandu: Ratna Pustak Bhandar.

Robinson, A. H. (1995). *Elements of cartography.* New York: John Wiley and Sons.