Nepal Open University

Faculty of Science, Health and Technology

Manbhawan, Lalitpur, Nepal

Master in Geoinformatics (Course Introduction)

Course Overview:

This program is designed to provide students with the knowledge of geospatial technology including and not limited to Remote Sensing (RS), and Geographic Information Systems (GIS), Global Navigation Satellite System (GNSS), and their applications. It is intended for students with an undergraduate degree and interested in geoinformatics. It aims at producing research capable graduates. Students completing the masters in geoinformatics will use creativity, initiative and independent judgement to address a wide range of spatial problems. They will be able to carry out research and analysis using spatial data and RS imagery to prepare research reports applicable to various fields of RS & GIS applications.

Course objectives:

The program provides a theoretical framework and practical knowledge for graduates wishing to extend their choice of career path by acquiring hands-on skills in the capture, analysis and communication of spatially-referenced information. Students successfully completing the program will gain extensive experience in the use of GIS, RS and digital image processing software.

Upon successful completion of this program, students will be able to:

a. describe the principles, concepts and applications of geospatial technologies including RS & digital image processing;
b. apply the knowledge gained in the use of GIS & RS tools and techniques to solve real-life spatial problems;
c. analyze the geospatial and earth observation data to measure the changes in earth
d. formulate a self-directed research using spatially-referenced data and RS imagery and defend the finding; and
e. communicate GIS & RS related ideas & research results both orally and in writing.

Eligibility:

The minimum qualification required to apply for the program is the completion of undergraduate or equivalent degree from recognized university.

- Any Stream with Undergraduate level are eligible to apply.
- Only students with CGPA equal or more than 2.4 equivalent are eligible.
- Basic knowledge of computer programming and experience of using software tools is desirable.
- Only those who successfully pass the entrance exam will be eligible for admission.

Awarded Degree

After successful completion, the students are awarded with Master degree. Two types of degree certificates are provisioned. “Masters of Engineering in Geoinformatics (ME-Geoinformatics)” and “Masters of Science in Geoinformatics (MSc- Geoinformatics)”. Those having Engineering or equivalent in their undergraduate can get “ME-Geoinformatics” after successfully completing extra courses designed for them while rest will be awarded “MSc-Geoinformatics”.

Scope:

1. Remote Sensing and GIS Analyst
2. Web-GIS Developer
3. Land Use/Urban Planner
4. Land Administrator
5. Conversationist
6. Cartographer
7. Surveyor
8. Climate Scientist

Duration:

This program is dived into 2 year and 4 semester.

- **Semester-I**
  - Five courses x 3 credit= 15 Credit
- **Semester-II**
  - Five courses x 3 credit= 15 Credit
- **Semester-III**
  - Five courses x 3 credit= 15 Credit
- **Semester-IV**
  - 2 courses x 3 credit= 6 Credit
  - Research/Thesis= 12 credit

Total: 63 Credit

Course Breakdown

Semester I

	Code	Name
1	GEOI 501	Remote Sensing
2	GEOI 502	Geographic Information System
3	GEOI 504	Cartography and Data Visualization
4	GEOI 505	Geospatial Programming
5	GEOI 506	Surveying

Semester II

	Code	Name
1	GEOI 551	Advanced Remote Sensing
2	GEOI 552	Spatial Analysis and Modeling
3	GEOI 556	Spatial data infrastructure and Internet of Things (IOT)
4	GEOI 557	Research Methodology
5	GEOI 558	Advanced Surveying

Semester III

	Code	Name
1	GEOI 603	Cadastre and Land Administration
2	GEOI 604	Geospatial Project Management
3	GEOI 605	Research Project Study and Seminar *(Preliminary Dissertation Works)*
4	GEOI 606	Land Use Planning
5	GEOI 607	Disaster Risk Management (DRM)

Semester IV

	Code	Name
1	GEOI 651	Machine Learning Techniques
2	GEOI 652	Elective I
3	GEOI 699	Dissertation

Syllabus for Entrance Test

1. Program Name: Masters in Geoinformatics

Eligibility: A Minimum bachelor's degree in any discipline with 2nd division or CGPA 2.4 & (Basic knowledge of Computer, & RS & GIS is preferable).

Medium: English

Full Marks:	100
Number of Questions (Objective Based)	100
Duration of Examination:	2 Hours
1. Elementary Mathematics = 25	Measurement of percentage, area, volume, simple quadratic equations, height & distance; solution of triangles, properties of triangles, circle; probability, mean, mode & standard deviation; basic geometry; basic knowledge of plane & polar co-ordinates; equation of straight line, circle, parabola; concept of vector, differentiation, limit & continuity; maxima & minima.
2. Optics & Electronics = 10	Fundamental knowledge of light ray, mirrors, lens, prism, spectrum, frequency, wavelength, radiation
3. Surveying & Mapping = 50	Basic knowledge of surveying & mapping, fundamental knowledge of GIS (definitions, data acquisition techniques, data transformation, visualization of spatial data, map design, data classification & spatial analysis); introduction to Global Navigation Support System (GNSS); Basic knowledge of digital image processing. Fundamental knowledge of remote sensing, application area of remote sensing and GIS (Forestry, Agriculture, Environmental Science, Disaster, Land Classification & Human Settlement).
4. General Knowledge = 5	Topography of land of Nepal; geography of World & nepal; population, sensor systems, professional organizations: (FIG, ISPRS, NASA, NRSPS, Nepal GIS Society etc.)
5. Communication skill = 10	Basic of grammar in English language, basic writing skill, English language, basic vocabulary, basic knowledge of computer skills.

Elective:

a. GEOI 519 Advance Image Processing (R/Python)
b. GEOI 520 Photogrammetry and Unmanned Aerial Vehicle Technology
c. GEOI 521 Big Data in Geospatial Technology
d. GEOI 522 Web GIS
e. GEOI 524 Spatial Database Designing
f. GEOI 525 Climate Services
g. GEOI 526 Cloud Computing of Remote Sensing Data

Orientation:

After the admission of the students to the program, NOU will arrange an in-house and virtual orientation program to familiarization of Learning Management System (LMS) of NOU.

Learning Modality:

This program will be delivered on a distance and online delivery mode using instructional learning mode. Course instructor/teacher will facilitate on e-learning process (LMS). Video Conferencing or face to face class will be provides based on nature of courses. Study include course work, practicum and dissertation. Students will engage in coursework and project preparation and examinations will be held at the end of each semester. There is an internship which takes place after the successful completion of the taught courses.

Examination and Evaluation:

In Semester: 40%

End Semester : 60%

The performance of students will be evaluated through ongoing in-semester evaluation and semester end evaluation. NOU shall have the final authority in conduction, evaluation and awarding grades in semester-based examination. The course facilitator(instructor) will decide the grade in the in-semester evaluations.

In-semester Evaluations:

The in-semester evaluation shall generally have total weight of 50 percent in online virtual learning mode. Assigned instructor shall be responsible for the continuous in-semester evaluations. In semester evaluation shall be based on a students' e-portfolio in assignment, attendance, assessment, case study/project work and collaboration between the students. End of each semester, group of students shall responsible to conduct the seminar on the given location of NOU.

Semester End Examination:

The semester end examination on course work related shall have a total weight of 50 percent. The semester end examination shall be based on analytical question, problems solving questions and knowledge testing question. The duration of examination shall be 4hours for 3 credit hours course.

Grading System

The grading system followed in the program will be based on the absolute performance of the student in the in-semester evaluation and semester end examination.