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Opportunities and Challenges of Geospatial (Geomatics/Surveying) Education in Nepal

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Introduction

- ❑ Geospatial education is fast growing discipline education which integrates acquiring, storing, modeling, analysis, retrieving, transforming, displaying and management of spatially data from different sources of airborne and satellite based spatial data. The courses of geospatial education are Computer Science, Cartography, Topography, Astronomy, Geodesy, Photogrammetry, Remote Sensing, GPS, and GIS etc.
- ❑ During initial phase, surveying education was just a training course, when colleges and universities are established then Geospatial education was started as an academic course.
- ❑ This education has a broad range of employment opportunities as well as offering challenging research, innovation and technical problems in a vast range of Geomatics engineering.



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Objectives of Geomatics Education

- The main objectives of this course are to produce the high level qualified academic manpower in Geomatic engineering field;
- To conduct and promote the skill, knowledge, research and development activities in the field of Geomatics engineering.
- To provide consultancy and other technical services to the local government bodies, business community, private enterprises, NGOs, INGOs etc. on demand.
- To conduct academic and applied research studies, surveys, conferences and seminars in the issues of national and international interests.
- To design awareness, appraisal, operational and professional level and make available for decision makers, technicians, and discipline specialists.
- To upgrade the training manpower with academic manpower;



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Geospatial (Geomatics / Surveying) Education in Nepal (1)

- As a history of Geomatics education in Nepal, the formal surveying education started from survey training center from 1968.
- The school of Geomatics (SOG) was established in 1999 and it started in Diploma in Survey Engineering from 2001.
- The Himalayan College of Geomatic Engineering and Land Resource Management (GIT) was established in 2004 and it started Bachelor of Geomatic Engineering from 2005 affiliated with Purbanchal University, Nepal.



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Geospatial (Geomatics / Surveying) Education in Nepal (2)

- Kathmandu University and Land Management Training Center (LMTTC) jointly started BE in Geomatics Engineering from 2007.
- Tribhuvan University (TU), Institute of Engineering (IOE), Western Regional Campus (WRC), Pokhara started of BE in Geomatics Engineering from 2012.
- Master of Science (Geographic Information Science & Systems – MSc (GIS) course started in Kathmandu Forestry College (KAFCOL) affiliated with University of Salzburg, Austria from 2012 and
- Master in Land Administration Course started Kathmandu University from 2013.



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GoN, Land Management Training Center (LMTC), 1968

- ❑ Land Management Training Centre (LMTC) is located in Bakhundol, Dhulikhel Municipality of Kavrepalanchok district at about 30 kilometers east of Kathmandu. LMTC under the Ministry of Land Reform and Management, is the only governmental institution which has been continually and significantly contributing for production of human resource and conduction of research activities in the field of geo-information science since its establishments in 1968 AD.
- ❑ LMTC has been conducting long-term training programmes which are senior survey training, junior survey training and Basic Survey Training. Since 2007 AD.
- ❑ The center has already trained more than 5000 survey technicians at different levels through various types of training programmes in Surveying and Mapping, Land Administration and various digital mapping technologies. The technology used to train up the center is very modern.



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CTEVT, School of Geomatics (SOG), 2001

- ❑ Bhusuchana Prabidhi Adyayan Pratisthan popularly known as School of Geomatics (SOG) was established in 1999 and it started Diploma in Survey (Geomatics) Engineering from 2001. The courses SOG currently imparts are mainly affiliated with Council for Technical Education and Vocational Training (CTEVT). Since the establishment, SOG has been focusing only on developing human resource in Geomatics engineering at Diploma and TSLC levels.
- ❑ The main moto for SOG is as “A Pioneer Institute of Surveying and Geo-information in Nepal”. Qualified and skilled human resource in the field of surveying, mapping and land resource management collectively referred as Geomatics is an ever-growing need in Nepal.



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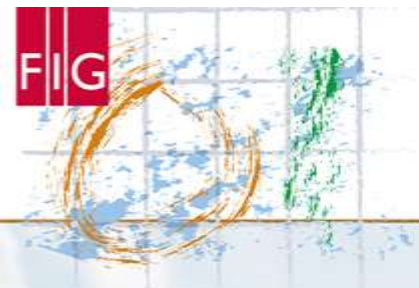


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PU, Himalayan College of Geomatic Engineering & LRM, 2004

- ❑ Himalayan College of Geomatic Engineering and Land Resource Management was established in 2004. In respect of this need of quality higher education institutions in the country, GIT has been running its Bachelor in Geomatics Engineering since 2005.
- ❑ This institute is planning to start Master of Geomatic Engineering in the near future.
- ❑ Engineering is regarded as one of the core inputs of overall development and prosperity of every society worldwide. It is also a proven fact that only the conventional education may not be enough in the context of fast dynamic and highly innovative global environment.
- ❑ It envisions delivering the best available engineering and technical education and all round opportunities to its entire student, often the best in the country, as they aspire to realize their personal talents and to expand their abilities. This leading academic institution sees to it as its responsibility to equip its students with an education relevant to their society and to their time - the 21st century.



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KU, Department of Civil and Geomatics Engineering, 2007

- ❑ Kathmandu University, School of Engineering, Department of Civil and Geomatics Engineering and Land Management Training Center (LMTC), is jointly offering Bachelor of Geomatics Engineering from 2007 and Master in Land Administration from 2013.
- ❑ The Geomatics Engineering program emphasizes the use of new technology for data collection, including electronic equipment for measuring, earth circling satellites for positioning, and computers for processing data and generating planning that can be used in a wide variety of professional disciplines. Geomatic engineering is fast growing discipline. The speed of development in the field is same as of Information Technology.
- ❑ Geomatics Engineers apply engineering principles to spatial information and implement relational data structures involving measurement sciences, thus using Geomatics as Spatial Engineers. Geomatics engineers manage local, regional and global spatial data for infrastructure development.



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TU, Institute of Engineering, Pashchimanchal Campus WRC 2012

- ❑ The Pashchimanchal campus, formerly also known as Western Region Campus (WRC), founded in 1981 as constituent campus of institute of engineering under Tribhuban University is located at northern part of Pokhara city committed for development of highly skilled engineering manpower in geospatial engineering field.
- ❑ Pashchimanchal campus envisioned to become a premier engineering educational institution with global standards and becoming the center of excellence in Geomatics engineering which can be achieved only on background mission of quality engineering education, professionalism and research works in relevant engineering fields. Paschimanchal Campus is one of the pioneering and very few educational institutions in Nepal offering Bachelor of Geomatics Engineering from 2012.
- ❑ WRC planning to run master level program in near future.



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UoS, Z_GIS, Kathmandu Forestry College (KAFCOL), 2012

- ❑ Kathmandu Forestry College (KAFCOL) was established in 2005 by the Nepal Agroforestry Foundation and a group of like-minded professionals and academicians deeply committed to the cause of promoting quality education and research in the fields of Forestry and Natural Resource Management in Nepal. KAFCOL has been steadily growing over the years.
- ❑ Currently, it runs three academic programs: (i) B.Sc. Forestry in affiliation with the Tribhuban University, Nepal, (ii) Diploma in Forestry in affiliation with the Council for Technical Education and Vocational Training (CTEVT), and (iii) M.Sc. in Geographical Information Science and Systems (GIS) in collaboration with the University of Salzburg, Austria from 2012.
- ❑ This programme has been authorized by the Ministry of Education, Government of Nepal.



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CTEVT, Technical School Leaving Certificate (TSLC) Colleges

The total 28 Technical School Leaving Certificate, (TSLC) Geomatics (Basic Surveying) college affiliated with CTEVT. The district wise college list as below;

- 1 College in Dadeldhura / Kailali / Kanchanpur / Palpa / Chitwan / Gorkha / Kathmandu / Lalitpur / Dolakha / Rautahat / and Jhapa district
- 2 Colleges in Banke / Dang / Rupandehi / Dhanusha / and Saptari district
- 3 Colleges in Surkhet district
- 4 Colleges in Sunsari district



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Geomatics Education Applications

Nepal has limited work on the Geospatial Education. The following applications of Geomatics education in Nepal as listed below;

- Military
- Search and rescue
- Surveying and mapping
- Tourism
- Forestry
- Geographic Information System (GIS) and
- Remote Sensing (RS) etc.



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Employment Opportunities of Geomatics Education

The employment opportunity of Geomatics education in Nepal are as below;

- Government of Nepal / Survey Department / Department of Mines and Geology
- Road Construction / Forest Department / Aviation Department
- Land Reform and Administration / Nepal Electricity Authority (NEA)
- Nepal Army / Nepal Police / Armed Police Force (APF)
- Hydro Power Sector / Engineering Consultancy
- Construction Company
- Urban Planners
- NGO's / INGO's
- Highly possibilities to migrate in the developed countries like USA, Canada and Australia etc.



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Challenges of Geomatics Education

- Geomatics education is the invariably considered as part of civil engineering in context of Nepal. Most of the survey works are undertaken by civil engineer and overseer instead of qualified geomatic engineer in Nepal.
- It is one of the big challenges in Nepal for fostering geomatics engineering education and field. Lack of facility, unavailability of qualified teacher remains another burden in this aspect. Expenses for buying surveying equipment, goods and software are highly expensive.
- And thus, fund for those expenses are not readily available which is yet another huge hurdle in developing geospatial engineering in Nepal.



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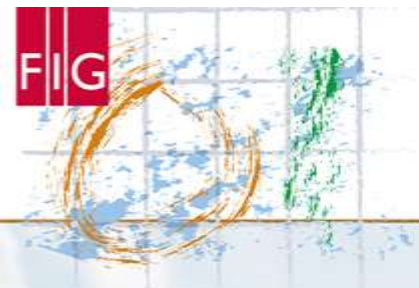


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Conclusion

- Geomatics education is the most technological education in surveying and mapping field.
- In recent year Global Navigation Satellite System (GNSS) widely used in establishment control points, monitoring the earth surface like crustal dynamic, tectonic plate movement in an earthquake purpose, control point monitoring as a mapping and surveying purpose.
- After Gorkha earthquake 2015, Global Positioning System (GPS) is the continue observation for monitoring of the earth surface as a sifted of earth surface. So, Geomatics education is highly demanded in the Nepal as well as world.



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Recommendation

- Capacity building is one of the weakest components in the development of geospatial education in Nepal.
- Required the advance knowledge in adjustment of GNSS technology, GPS data processing and network adjustment.
- University level focus on research, seminars and workshop related to geospatial education.
- Geomatics education related topics should be introduced to student thesis and projects.



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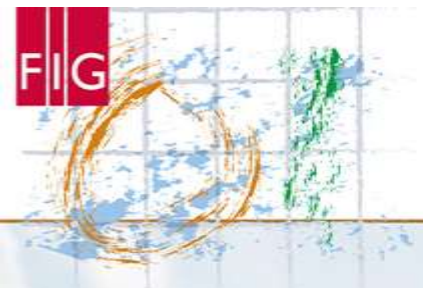


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