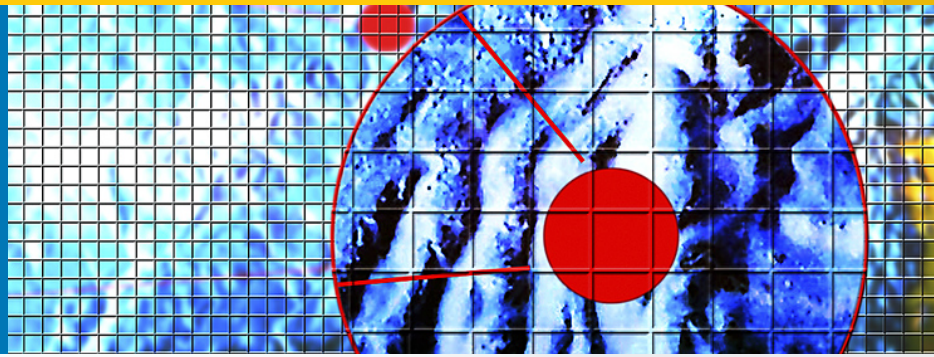


**NEW ONLINE PROGRAM** from Civil Engineering through Engineering Professional Education – Starting August 2007



## VALUE ADDED OPPORTUNITY

Starting in August 2007, Engineering Professional Education (ProEd) will deliver an innovative program for those interested in exploring the geo-spatial complexities of the earth with the launch of an online specialization in Geomatics. This valuable academic focus will be offered as part of our highly flexible, multidisciplinary Master of Science in Engineering (MSE) and Master of Science (MS) programs.

## REFINING GLOBAL PERSPECTIVES

Geomatics is the enabling technology that facilitates the powerful integration of imagery, terrain, spatial features, and cultural features in mapping the earth. Geomatics study has both commercial and defense industry applications.

### Geomatics Overview:

- Both an engineering and scientific discipline, Geomatics is devoted to the collection, modeling, analysis, exploitation, dissemination, and management of geographic and spatially referenced data.
- Data sources include optical surveying equipment; laser scanning; industrial metrology; airborne, satellite, and terrestrial systems; imaging radar; and satellite navigation systems (such as GPS).

- Data collected is applied to such applications as conventional mapping, remote sensing, reconnaissance, 3D scene generation, vehicle navigation, geographic information systems (GIS), land and infrastructure development, natural resource monitoring and agricultural resource evaluation.
- Analysis and modeling take place in a geodetic framework of coordinate systems and transformations. This framework permits spatial overlay, alignment, and fusion of data from diverse sources.
- Popular consumer applications on the Internet show terrain, spatial features, and cultural features. Geomatics is the technology driving these compelling applications.

## ENHANCE YOUR CREDENTIALS

Designed to provide working professionals with the added skills and knowledge it takes to gain a competitive edge in their industry, this specialization is ideal for scientists, engineers, and technicians working in fields related to:

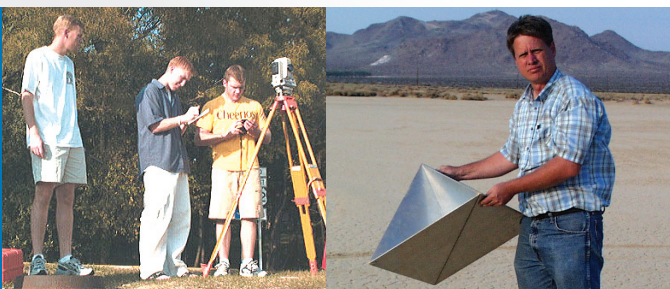
- Imagery
- Imagery exploitation
- Photogrammetry
- Navigation
- Satellite geo-positioning (GPS)
- Land development, surveying, mapping
- Geographic information systems

- 3D CAD modeling
- Visualization
- Forensic engineering
- Accident reconstruction
- Industrial metrology

## PURDUE DELIVERS A COMPETITIVE EDGE

Participation in our online program will enable you to gain valuable Geomatics expertise including:

- Grounding in the fundamental technologies needed to build accurate 3D models from imagery – including imagery from spaceborne, airborne, or terrestrial platforms.
- Understanding of the process for building geometric sensor models in order to exploit new sensors.
- Learning how to implement relevant algorithms in software to create applications and end-user tools.
- Mastering the statistical aspects of estimation and error propagation for geo-positioning.
- Learning the fundamentals of GPS and Lidar and integrating these into modern GIS environments.
- Learning to relate modern measurement technologies to cadastral, transportation, and land development issues.



*The opportunities for a student to excel in Geomatics are endless. The broad range of courses and internationally recognized faculty allow us the chance to pursue our interests and have a choice of employment when we graduate.*

Jim Monty  
Current PhD student in  
Geomatics

## FLEXIBILITY FOR BUSY PROFESSIONALS

If you're seeking to expand your credentials without disrupting your career, Purdue's distance learning is the ideal answer. Taking classes on demand over the Internet provides the opportunity to pursue your degree on your schedule while working full-time in industry.\*

Classes are available primarily via streaming video over the Internet. Select courses are available via Webcast, CD, DVD or videotape.

\*Inquire whether your company sponsors an educational benefits program.

## GETTING STARTED

You may register for up to four courses as a non-degree student prior to applying for admission to the multidisciplinary MSE or MS program. Admission requirements differ by department. Visit the ProEd website for specific information on the MSE/MS and other home departments: [www.proed.purdue.edu](http://www.proed.purdue.edu)

All applications for the specialization must be approved by the Geomatics program. The request form and instructions for completing it are available on the ProEd website: [www.proed.purdue.edu](http://www.proed.purdue.edu) > geomatics specialization

## ACADEMIC REQUIREMENTS

Purdue engineering master's degrees are available in 30 credit hours (10 courses) with no thesis requirement. Seven courses must be selected from the Geomatics offerings listed below, and three courses from approved electives.\* Relevant transfer credits from other institutions may be approved if they have not already been applied to a degree.

### Geomatics courses:

- GRAD590X Analytical Fundamentals for Geomatics
- GRAD590X Digital Photogrammetric Systems
- GRAD590X Adjustment of Geospatial Observations
- GRAD590X Geographic Information Systems
- GRAD590X Coordinate Systems and Conformal Mapping
- GRAD590X Satellite Positioning
- GRAD590X Exploitation of Spaceborne Imaging Systems
- GRAD590X Advanced Geospatial Estimation
- GRAD590X Multi and Hyperspectral Remote Sensing

Note: letter suffix in course number will be assigned prior to each semester.

\*Additional course options will be added as they become available. All ProEd course offerings are based on availability.

## Digital Photogrammetric Systems (GRAD590D) Available August 2007

Reconstruction of 3D objects and terrain from digital imagery taken with conventional frame cameras. Photogrammetric data as input for CAD, GIS, and VR databases. Modeling and estimation of camera and object point parameters using least squares. Coordinate systems, coordinate rotations, image resection and bundle block adjustment. Rectification and orthorectification of vertical and oblique imagery. Flight and mission planning. Pairwise rectification; stereo viewing and data extraction. Commercial photogrammetry applications. Accuracy standards and error propagation. Automation of photogrammetric processes; image matching, DEM generation. Basic image processing. TIN processing: data structures, exploitation. Synthetic image creation from object models for visualization.

Prerequisites: Graduate standing or consent of instructor.

Note: some computer programming will be required with MATLAB and/or C/C++

## SAMPLE PLANS OF STUDY

Two sample plans of study are given below with durations of 2.5 and 5 years.

### 2.5 Year Sample Master's Plan of Study

Semester	Course
Fall	GRAD590X Digital Photogrammetric Systems STAT 516 Basic Probability and Applications
Spring	GRAD590X Geographic Information Systems GRAD590X Exploitation of Spaceborne Imaging Systems
Fall	GRAD590X Coordinate Systems and Conformal Mapping GRAD590X Adjustment of Geospatial Observations
Spring	GRAD590X Satellite Positioning GRAD590X Advanced Geospatial Estimation
Fall	GRAD590X Multi and Hyperspectral Remote Sensing STAT 512 Applied Regression Analysis

### 5 Year Sample Master's Plan of Study

Semester	Course
Fall	GRAD590X Adjustment of Geospatial Observations
Spring	GRAD590X Advanced Geospatial Estimation
Fall	GRAD590X Coordinate Systems and Conformal Mapping
Spring	GRAD590X Satellite Positioning
Fall	GRAD590X Digital Photogrammetric Systems
Spring	GRAD590X Exploitation of Spaceborne Imaging Systems
Fall	GRAD590X Multi and Hyperspectral Remote Sensing
Spring	GRAD590X Geographic Information Systems
Fall	STAT 511 Statistical Methods
Spring	ECE 637 Digital Image Processing I



### For More Information

For questions or more information about the online Geomatics specialization visit the ProEd website or contact our office today:

Toll-free U.S. only: **(877) 598-4233**

Local/International: **(765) 494-7015**

E-mail: **[proed@purdue.edu](mailto:proed@purdue.edu)**