Geomatics Engineering Program
Department of Civil and Environmental Engineering and Geodetic Science

CURRICULUM GUIDE & CURRICULUM OPTIONS FOR UNDERGRADUATES

This guide is offered as a supplement to the Official University Bulletin. The Guide contains the latest, most relevant and applicable curriculum information for the pre-Geomatics Engineering student and for those students who are currently enrolled as majors in Geomatics Engineering within the Department of Civil and Environmental Engineering and Geodetic Science. It outlines the prerequisites in each area of specialization, the general course requirements for the BS degree in Geomatics Engineering, and describes the core program that must be followed to permit proper course sequencing.

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- **Activate your OSU e-mail account. Only your OSU e-mail address is used in our listserve.**
- **Check your e-mail regularly for updates and course schedule changes.**
- **Print a copy of the Undergraduate Handbook at the beginning of every year (the document is available from the Department web site – see http://www.ceegs.ohio-state.edu/GSUNDERGRAD/). There are always minor changes to the Curriculum Guide every year.**

Geomatics Engineering Program
Department of Civil and Environmental Engineering and Geodetic Science

UNDERGRADUATE HANDBOOK 2006-2007

Geomatics Engineering Program
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What is Geomatics Engineering?

Geomatics Engineering is a rapidly developing discipline that focuses on spatial information, *i.e.,* information that has a location. The location is the main factor used to integrate a very wide range of data for viewing and analysis. As almost all information has some kind of location, the varieties of information and applications with which the Geomatics Engineer is involved are extremely wide.

Geomatics Engineering includes the disciplines of geodesy and geodetic science, photogrammetry, remote sensing, mapping, land and geographic information systems, spatial computing, computer vision, and all types of surveying. Geomatics is the science that knits all these spatial information disciplines together and Geomatics Engineering is developing the science and creating new uses for the technology developed.

A Look at the Parts of Geomatics Engineering

Geodesy and Geodetic Science

Geodesy is concerned with precise positioning on the Earth, and thus serves as a foundation for other spatial sciences. It is also concerned with precise determination of the size and shape of the Earth, measurement of the Earth's gravity field, and the monitoring of geodynamic phenomena.

Geodesy is closely related with other Earth Sciences like solid Earth physics, hydrology, atmospheric sciences, oceanography, glaciology, geophysics and geology, and thus aids our understanding of the dynamic behavior within the solid and liquid Earth, the movements of crustal plates and the behavior of the oceans and atmosphere.

Geodetic science uses some of the most advanced satellite measurements, and electronic and computer technologies. Radio and visual astronomy, satellite measurement of location, space-based measurements of atmospheric and oceanic phenomena, laser and radio measurement of satellite location, use of inertial navigation and measurement systems, gravity measurement and computer modeling are all part of the work of geodesists.

Geodesy has been a major field of study and research at OSU for nearly half a century and OSU has an excellent international reputation in the field.

Computer Mapping

Computer systems that can handle spatial data and information are now finding widespread application. Professionals with the skills to work with spatial information in Land and Geographic Information Systems (LIS and GIS) are in high demand. Computer mapping goes far beyond paper maps, allowing interactive maps, 3-D maps, and complex querying and modeling in which the

Photogrammetry and Remote Sensing

Photogrammetry is the science of high precision measurements from photographs and other forms of imagery. This ranges from aerial photographs for mapping, through close-range photos for medical measurements, to the use of digital images in sophisticated digital workstations. Photogrammetry is now moving into the computer vision and image understanding fields and digital photogrammetry is revolutionizing the way we think about and work with maps.

Remote sensing is concerned with acquiring spatial information from a range of sensors, including satellite imagery, airborne scanners and radar satellites. Computer-based digital image processing allows the classification of information about what is on the ground.

Photogrammetry and remote sensing provide large amounts of data about the landscape very rapidly, and are often used for disaster monitoring, environmental assessment and rapid monitoring of areas. Mapping can now be done from moving ground vehicles, using digital photogrammetry and high-precision positioning technology. OSU has led the world in the development of mobile mapping technology.

Spatial Computing

Spatial computing is all about ways of using spatial data and information in computerized operations and systems. Spatial data comes in a great many forms, and in many cases, conventional software do not work well with it. There is a great deal of interest in combining location and spatial knowledge with many other types of information.

Spatial computing is related to areas such as computer vision, where we try to get a computer to understand what an image means, rather than

spatial data are linked to a wide range of other types of data. Census data, municipal land records, environmental data, socio-economic and business data can all be linked and analyzed in their spatial context.

Geographic Information Systems (GIS)

GIS systems bring together large amounts of data, spatial and non-spatial, to aid in complex decision-making, planning and management of resources, and land management. Many systems of this type are in use in the government and private sectors.

GIS expertise involves an understanding of how spatial data and information behaves, a knowledge of data structures in computerized information systems, system and application development, an ability to work within complex administrative and institutional environments, as well as an understanding of application areas.

Land Information Systems (LIS)

LIS are like GIS, but focus on questions of land ownership, land management and automation of cadastral systems. This field is booming internationally, as the former communist nations attempt to sort out land ownership problems, as well as try to deal with complex environmental problems.

Expertise in LIS combines a thorough understanding of GIS with knowledge of land and general law, land ownership system and the operation and economics of land markets.

just things that can be recognized in the image. This has application in other areas of geomatics, as well as in industrial applications.

Geomatics engineers will be well placed to develop this technology and find ways of using the technology to solve complex problems in the work place and the environment.

Surveying

Surveying includes boundary, or cadastral surveying, which provides the basis for the cadastral system, which in turn guarantees the ownership of land and the economic systems built on top of the security of land.

The value of an efficient cadastral system has been demonstrated in a multi-billion dollar program in Thailand to establish such a system across the whole country, thereby providing a solid basis for their expanding economy.

Surveying is also used in engineering and construction work, as well as a range of high-precision tasks. These include measurement of structures like dams, bridges and buildings for safety during construction.

Topographic surveying is used to make detailed maps, generally in a computer, for design and development. Mining surveying is used for measurements for mines, tunnel construction and underground safety.

Surveyors today use satellite receivers, laser-based total stations and high-powered workstations and software for their work. They also provide links in multi-disciplinary teams, as are often found on large projects.

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ADMISSION POLICY

1. Criteria for Acceptance to the Geomatics Engineering Major

The Pre-Geomatics Engineering Core courses are normally taken in the Freshmen year. Students will be enrolled in the Pre-Geomatics category and will be advised by the Geomatics Engineering Academic Advisor. Students must complete all of the courses in this group with a Point Hour Ratio (PHR) of at least 2.0, based on all grades earned in all attempts of courses in this group, and must have attained a minimum Cumulative Point Hour Ratio (CPHR) of 2.0 at Ohio State (and also other universities/colleges for transfer students) before they are eligible to apply to become Geomatics Engineering (202) majors and proceed with their Geomatics Engineering curriculum.

Pre-Geomatics Engineering Core: Phys 131, 132; Math 151(Math 140,141), 152, 153; ENG 181 and 183, EG 167 or CSE 202; In addition, students should successfully complete English 110 and the ENG Survey 100 course. The ENG Survey 100 course is waived for students transferring from another four year college.

Please see Cara (475 HI) if you have credit or transfer credit for EG 166.

Students are admitted to the Geomatics Engineering Major every **Autumn only**. Click here for the Application to Major Form. The Application to Major Form is submitted in winter for spring entry and in spring for autumn entry into the program.

2. Exceptions for Under-Represented Groups

Special consideration for admission will be given to members of groups under-represented in Geomatics Engineering.

3. Transfer Students

Domestic transfer students seeking direct admission into a major of the College of Engineering must meet the same individual requirements as students transferring from within the Ohio State University (see 1. above). In addition, there will be an evaluation of the student's former curriculum by the College of Engineering and by the Department. Students transferring from institutions lacking regional accreditation must have a minimum CPHR of 2.8 on a 4.0 scale.

The Geomatics Engineering Transfer Credit Coordinator monitors the evaluation of transfer credit. The sequence in which transfer credit is evaluated coincides with the sequence in which the courses appear in the curriculum. The Transfer Credit Coordinator will designate which courses are to be evaluated and will determine the faculty member who is to perform the evaluation. *Transfer courses are not equivalent to OSU courses unless the prerequisites are substantially equivalent.* The awarding of transfer credit from foreign, non-ABET, or non-CAB accredited institutions normally will be by examination in the Department of Civil and Environmental Engineering and Geodetic Science.

Career Prospects with a BS in Geomatics Engineering

The career opportunities for geomatics engineers are bright. There is currently a shortage of qualified cadastral (or boundary) surveyors in the US. Construction surveyors make measurements of buildings and other project sites to make recommendations to engineers, architects and other professionals at all stages of construction. Graduates with GIS and LIS expertise are particularly sought after, as are photogrammetry and remote sensing analysts. Geodesists determine the shape and size of the earth and the precise location of points on the earth's surface. With GPS, geodesists can tell the exact position of an object. Forensic surveyors and expert witness specialists add credibility to court cases on property disputes or aspects of industrial or transportation accidents. Topographic surveyors measure and map the shape, contour and location of land features. Hydrographic surveyors measure underwater topography, which is important for measuring erosion or guiding dredging operations.

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Sequencing Through the Program

Program Description

Note: The Geomatics Engineering program will use the course designation 'GS' for all courses run within the GSS program.

Year One

Autumn Quarter

Math 151	Calculus and Analytical Geometry	5	Au,WI,SP,SU
Engineering 181	Introduction to Engineering I	3	AU,WI, SP
Engineering 100	Engineering Survey	1	AU, WI, SP
GEC		5	AU,WI,SP
		14	

Winter Quarter

Math 152	Calculus and Analytical Geometry	5	AU,WI,SP,SU
Physics 131	Particles and Motion	5	AU,WI,SP,SU
Engineering 183	Introduction to Engineering II	3	AU,WI,SP
GEC		5	AU,WI,SP
		18	

Spring Quarter – Apply to Geomatics Major

Math 153	Calculus and Analytical Geometry	5	AU,WI,SP,SU
Physics 132	Electricity and Magnetism	5	AU,WI,SP,SU
EnGraph 167C or CSE 202	Problem Solving Programming or Problems & Algorithms for Eng & Sci	4	AU,WI,SP
GEC		5	AU,WI,SP
		19	

Substitutions

The Math 161, 162, 263 advanced sequence can be used to replace Math 151, 152, 153, 254 sequence, although this should only be attempted by more advanced students. This reduces the student's load by 5 credit hours without affecting academic progress. These students should therefore take an additional 5 credit hours of elective courses later in the program to achieve the appropriate total number of credit hours, if they will be below the College requirement of 196 credit hours at graduation.

Year Two

Autumn Quarter

Math 254	Calculus and Analytical Geometry	5	AU,WI,SP,SU
GS 400.01	Introduction to Surveying	2	AU
GS 400.02	Introduction to Photogrammetry	2	AU
GEC		5	AU,WI,SP
		14	

Winter Quarter

Stats 145	Introduction to Practice of Statistics	5	AU,WI,SP,SU
C&RP 310	Intro to City & Regional Planning	4	AU,WI,SP
Math 568	Introduction to Linear Algebra I	3	AU,WI,SP,SU
GS 410	Spatial Data Analysis	4	WI
		16	

Spring Quarter

GS 450	Spatial Data Adjustment I	4	SP
EG 410A	Engineering CAD (autocad)	3	WI,SP
Chem 121	General Chemistry	5	AU,WI,SP,SU
GEC		5	
		17	

Year Three

The required courses can be taken at any time during the junior and senior years, allowing for prerequisites. Note that some courses are offered in alternate years, and that many courses are only offered in one quarter per year. Some courses have alternatives offered for Honors students.

The summary credit hours at the end of each group of required courses do not include the credit hours for core GEC courses, which are counted elsewhere.

Autumn Quarter

GS 560	History of Surveying	5	AU
GS 607	Fundamentals of Geographic Information System	4	AU
BusFin 510	Legal Environment of Business	4	AU,WI,SP,SU
GS 550	Spatial Data Adj II	3	AU
	Technical Electives	4	
		15	

Winter Quarter

GS 561	Boundary Surveying	4	WI
GS 603	Remote Sensing	4	WI
ME 410	Statics	4	AU,WI,SP,SU
BusFin 775	Real Estate Law	4	WI
		16	

Spring Quarter

GS 562	Subdivision Design	3	SP
GS 629	Digital Photogrammetry I	4	SP
GS 625	Cadastral Information Systems	4	SP
GEC		5	
		16	

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Year Four

Autumn Quarter

GS 563	Land Info Management	4	AU
GS 540	Senior Project I	1	AU
Physics 133	Electrodynamic & Quantum Mech	5	AU,WI,SP,SU
	Technical Elective	4	
		14	

Winter Quarter

GS 636	Map Projections	4	WI
GS 541	Senior Project II	1	WI
CE 576	Civil Engineering Economics and Planning	4	WI
	Technical Electives	8	WI
		17	

Spring Quarter

GS 542	Senior Project III	2	
GS 575	Professional Practice	2	
GS 608	Intro to GPS I	3	
GEC		5	
	Technical Electives	4	
		16	

GEC Requirements

English and Communication Skills

English 110	Freshman English	5	
Second Writing Course		5	
GS 625	Cadastral Information Systems	4	(10)

Historical Survey

History 1	(Free Choice)	5	
History 2	(Free Choice)	5	(10)

Social Sciences

Economics 200(required)	Principles of Microeconomics	5	
Free Choice from group A or B		4	(9)

Arts and Humanities

Literature		5	
Visual/Performing Arts or Other Arts & Humanities		4	(9)

Foreign Language (waived)

University Capstone (waived)

Social Diversity in the US (to be combined with another GEC course if possible)

Total GEC Credit Hours Required: 38

Program Credit Hours Totals

Pre-GE	35
Geomatics Core	105
General Education	40
Technical Education	18
Total	**198**

GRADUATION

1. **Preparing to graduate.** Prior to your Senior year, run a Degree Audit that is available on the Registrars website to make certain that you have met your General Education Curriculum (GEC) requirements and Geomatics Engineering major courses. Click here to run a degree audit. If you wish to petition for courses that are not on the list of the College of Engineering Approved General Education Curriculum, you must submit a *General Petition Form 1A*. The petition should be submitted as soon as the non-conforming course is known, and before the course is taken. Any course taken at another university that the student wants counted for GEC credit at OSU also requires a General Petition Form 1A. The 1A Petition Forms are submitted to the Geomatics Engineering Undergraduate Committee with supporting documents. The College of Engineering has final authority to approve or disapprove these petitions. Allow plenty of time for these petitions because several steps are required in the approval process. Moreover, some of the committees that give these approvals only meet once a quarter.

2. **Applying to graduate.** Application to Graduate forms are due **three** quarters before the quarter in which you expect to graduate. Click here for the *Application to Graduate* form. This packet contains two forms:

   a. *Certification of Professional Courses and General Education Curriculum* form. Assuming that you have the Technical Option Approval form (from step 4) on file in the Geomatics Engineering Undergraduate Office and that you have taken GEC's that comply with College requirements or have filed a General Petition Form 1A for a non-standard program, the Geomatics Engineering Undergraduate Office staff will be able to endorse your Certification of Professional Courses and General Education Curriculum form.
   b. *Application for Baccalaureate Degree* form. This form lists your proposed schedule for your final two quarters. When the College office processes this form, they also check to see that you will have met all degree requirements, if you comply with your projected schedule for your last two quarters.

3. **Academic standards for graduation.** In addition to other requirements, the College of Engineering specifies that to graduate, students must maintain a 2.0 point-hour ratio in all credit hours taken in your department or academic area. For purposes of this rule, CEE designates these courses to be: BusFin 510, 775; Math 568 (571); Stats 145; ME 410; CRP 310; EG 410A; GS 400.01, 400.02, 410, 450, 550, 560, 561, 562, 563, 575, 603, 608, 625, 629, 636; CE 576, 607; and all courses selected as Technical Elective Courses.

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THE CURRICULUM

The curriculum leading to the BSGE degree consists of **198 quarter** hours of course work. The Master Schedule of Classes and the current University Course Offering Bulletin are at: www.ureg.ohio-state.edu.

Pre-GE Courses (64 Hrs)*		Hrs	Qtr Offered
Mathematics			
151	Calculus & Analytic Geometry	5	Au,Wi,Sp,Su
152	Calculus & Analytic Geometry	5	Au,Wi,Sp,Su
153	Calculus & Analytic Geometry	5	Au,Wi,Sp,Su
254	Calculus & Analytic Geometry	5	Au,Wi,Sp,Su
568	Introduction to Linear Algebra	3	Wi
Physics			
131	Introductory Physics: Particles and Motion	5	Au,Wi,Sp,Su
132	Introductory Physics: Electricity and Magnetism	5	Au,Wi,Sp,Su
133	Introductory Physics: Thermal Physics, Waves, & Quantum Physics	5	Au,Wi,Sp,Su
Chemistry			
121	Principles of Chemistry	5	Au,Wi,Sp,Su
Intro to Eng			
181	Introduction to Engineering I	3	Au,Wi,Sp,Su
183	Introduction to Engineering II	3	Au,Wi,Sp,Su
Eng Graph			
167C	Engineering Graphics II	4	Au,Wi,Sp
Mech Eng			
410	Statics	4	Au,Wi,Sp,Su
ENG 100		1	Au,Wi,Sp
General Education Curriculum (GEC) (40 hrs) Must include Economics 200			
Geomatics Engineering Core (105 hrs)			
Geomatics Eng			
GS 400.01 & .02	Surveying & Measurements in Civil Engineering	4	Au
GS 410	Spatial Data Analysis	4	Wi
GS 450	Spatial Data Adjustments I	4	Sp
GS 540	Senior Project I	1	Au,Wi,Sp,Su
GS 541	Senior Project II	1	Au,Wi,Sp,Su
GS 542	Senior Project III	2	Au,Wi,Sp,Su
GS 550	Spatial Data Adjustments II	3	Au
GS 560	History of Surveying	3	Au
GS 561	Boundary Surveying	4	Wi
GS 562	Subdivision Design	3	Sp
GS 563	Land Information Management	4	Au
GS 575	Professional Practice	2	Sp
GS 603	Remote Sensing of Environment	4	Wi
GS 607	Fundamentals of Geographic Information Systems	4	Au
GS 608	Introduction to Global Positioning Systems	3	Sp
GS 625	Cadastral Information Systems	4	Sp
GS 629	Digital Photogrammetry I	4	Sp
GS 636	Map Projections	4	Wi
EG 410A	Engineering CAD	3	Wi,Sp
BusFin 510	Legal Environment of Business	4	Au,Sp,Wi,Su
BusFin 775	Real Estate Law	4	Wi
CE 576	Civil Engineering Economics & Planning	4	Wi
C&RP 310	Introduction to City and Regional Planning	4	Au,Wi,Sp
Stats 145	Introduction to the Practice of Statistics	5	Au,Wi,Sp,Su
	Technical Electives (18 hrs)	18	

* English 110 and ENG 100 must be completed prior to applying to the Geomatics Engineering Major.
The total hours required for graduation is 196.
Please see Cara (HI 475) if you have credit or transfer credit for EG 166.

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Technical Electives Available within the BS in Geomatics Engineering Program

Students are required to take a minimum of **18 credit hours of elective courses** from the following list:

GS 604	Terrain Analysis	4	AU
CE 797	Interdepartmental Seminar on Remote Sensing (on demand)	2	
GS 628	Analytical Photogrammetry I	4	WI
GS 630	Computer Aided Cartography	4	AU
GS 632	Large-Scale and Topographic Mapping	4	WI
GS 634	Digital Mapping System	4	WI
Geog 685	Intermediate GIS	5	WI
Geog 686	GIS in Social Science and Business Research	5	SP
Geog 687	Design and Implementation of GIS	5	AU
BusFin 773	Real Estate Valuation	4	AU
GS 502	Engineering Survey	4	SP
GS 521	Geodetic Measurement	4	WI
GS 609	Surveying with Satellites	3	WI
Math 551	Vector Analysis	5	SP
GeolSci 680	Earth Physics	5	AU

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CSCC-OSU Course Equivalent List

Columbus State Community College	*The Ohio State University*
SURV 141 – Basic Surveying (4)	CE/GS 400.01 – Introduction to Geomatics/Surveying (2) GS 401 – Surveying Techniques (1)
SURV 241 – Route Surveying (4) *and* SURV 243 – Heavy Construction Standards (4)	GS 502 – Engineering Survey (4)
SURV 245 – Survey Law (3) *and* SURV 249 – Land Subdivision Systems (3)	GS 561 – Boundary Surveying (4)
SURV 247 – Townsite and Urban Development (3) *and* SURV 249 – Land Subdivision Systems (3)	GS 562 – Subdivision Design (3)
GIS 105 – Elements of Photogrammetry (2)	GS 400.02 – Elements of Photogrammetry (2)
ARCH 112 (Construction CAD Drafting – CAD I) *or* ARCH 113 (Architectural Drafting – CAD II)	GS 501 – Surveying CAD Applications
	EnGraph 410A ~ GS 501

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24 Quarter Credit Hours of Surveying Courses
(as approved by the Ohio State Board)

List Courses in Proper Category	Prerequisite	Quarter Offered	Credit Hours Total Course	Credit for Boundary Surveying Only	Credit less Boundary Surveying Credit
Required:					
GeodSci 410 - Spatial Data Analysis	GS 400	Wi	4	4	0
GeodSci 561 - Boundary Surveying	GS 560	WI	4	4	0
(Must have **4** of the following)					
BusFin 775 - Real Estate Law	BusFin 510	Wi	4	0	4
C&RP 310 - Urban Planning	none	AU,WI,SP	4	0	4
GeodSci 560 - Surveying History	GS 400	AU	3	0	3
GeodSci 502 - Route Surveying*	GS 410		4	0	4
GeodSci 562 - Subdivision Surveying	GS 561	SP	3	0	3
GeodSci 400 - Surveying Fundamentals	CE or GE major	AU	4	0	
Other Courses above Fundamentals					
GeodSci 625 – Cadastral Info Systems	none	SP	4	4	
Total			30	8	21 min

* SURV 241 – Route Surveying (4) *and* SURV 243 – Heavy Construction Standards (4) at Columbus State Community College is equivalent to GS 502 – Engineering Surveying (4)

Successful completion of these courses can result in a Surveying Minor for Civil Engineering students.

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HONORS PROGRAM
ABET-Accredited in Geomatics Engineering

DEPARTMENTAL HONORS OPTION

The Honors Option is limited to students having an overall CPHR of **3.4** or above and *maintaining a CPHR of 3.4 or above* throughout the remainder of their undergraduate program.

Honors students are required to take the regular Geomatics Engineering core, *but the Technical Electives may be designed by the student and his or her faculty advisor to fulfill the individual student's educational objectives*. A special project study could be included.

The Technical Advisor and the Honors Advisor must approve a coherent Technical Elective program. Deviations from approved programs require prior approval from these same individuals. No minimum number of credit hours in Geomatics Engineering courses or of Approved Technical Electives is specified.

COLLEGE OF ENGINEERING HONORS PROGRAM

Our program in Engineering consists basically of two parts:

1. Honors courses that students can take during their first two years, and
2. Research projects that may be done during their final two years leading to an honors thesis.

The Engineering Honors criteria for entering Freshman students are that they must graduate in the upper 10% of their high school class and have an ACT composite of **29** or higher or a sum of the SAT mathematics and verbal scores of **1300** or higher. The student must then maintain a CPHR of **3.4** or higher to be considered an Engineering Honors student. The following opportunities are available to Engineering Honors Students:

1. **University Honors Residential Facility.** You may live in the University Honors Residential Center. About half of the students who are living there are Engineering Honors students.
2. **Preference in Scheduling.** Your schedules are given preference in the registration process.
3. **Enrolling in Honors Courses.** You can register for as many or as few honors courses as you desire.
4. **Doing Honors Research.** We encourage you to include work with a faculty member on some research during your Junior and Senior years.
5. **Applying for Undergraduate Research Scholarships.** The College of Engineering awards research scholarships every year to Honors Students who have written the best research proposals for Honors Research.
6. **Graduation with Distinction**. Any Engineering student who graduates with a CPHR of 3.4 or better and has written an Honors Thesis on Honors Research performed during the undergraduate program and has passed an Oral Exam will graduate "with distinction." This honor will be printed on the diploma and in the graduation program.

Honors students are also eligible to graduate "with honors in engineering." Please visit http://www.eng.ohio-state.edu/currentstudents/honorsstudents.php for more information.

ACADEMIC STANDARDS

Every Geomatics Engineering undergraduate student must meet certain standards of academic achievement. Students who fail to meet these criteria will be placed on academic probation. Specifically, the University Rules provide for two types of probation. (Fresh Start Rule (3335-7-261) and Freshmen Forgiveness are excluded.)

Probation by Special Action

(*University Rule 3335-9-25B*). If at any time the preparation, progress, or success of a student in an academic program is determined to be unsatisfactory, the College or School in which the student is registered shall be empowered to place the student on **Academic Probation**.

A Geomatics Engineering student will be placed on **Special Action Probation,** if the student has failed to maintain at least a 2.0 PHR based on all grades earned in all attempts of the following Monitored Courses:

At Pre-Geomatics Engineering level: Math 151, 152, 153; Physics 131, 132; ENG 181, 183; EG 167 (CSE 202) [or equivalents].

At Geomatics Engineering Major level: All Pre-Geomatics Engineering level classes; BusFin 510, 775; Math 568 (571); Stats 145; ME 410; CRP 310; EG 410A; GS 400.01, 400.02, 410, 450, 550, 560, 561, 562, 563, 575, 603, 608, 625, 629, 636; CE 576, 607; and all courses selected as Technical Elective Courses.

A Geomatics Engineering student who is on **Special Action Probation** will be sent a letter to their official university mailing address describing the particular conditions of the probation. Typical probation conditions include, but are not necessarily limited to:

a. *The student must meet during the first week of each quarter with the Chair of the Undergraduate Studies Committee to discuss the terms of the student's Special Action Probation. In addition, the student must meet with the Chair of the Undergraduate Studies Committee during the 7th week of the quarter to discuss progress in their program of study.*

b. *The student must take a course load each quarter that is discussed with and approved by the Chair of the Undergraduate Studies Committee, who serves as the student's academic advisor while the student is on Special Action Probation.*

c. *The student may neither drop courses nor get any "incomplete" grades without the Chair of the Undergraduate Studies Committee's prior written permission.*

d. *The student must remove a specified number of deficiency points based on grades earned in the monitored courses. Typically, three deficiency points must be removed if only one monitored course is taken, and five deficiency points must be removed if two or more monitored courses are taken.*

A Geomatics Engineering student on Special Action Probation will not be dismissed unless at least 15 hours of Monitored Courses have been attempted.

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REINSTATEMENT OF DISMISSED STUDENTS

Reinstatement after departmental dismissal

Students who have been dismissed from the program due to failure to meet conditions of Special Action Probation may petition the Undergraduate Studies Committee to undertake a program of remedial action leading to reinstatement in the program. Such reinstatement programs typically involve the requirement that students retake all D's and D+'s earned in the course group Math 151, 152, 153, 254, 568 (571); Physics 131, 132, 133; ME 410; ENG 181, 183 (Eng Graph 166), and 167; Chem 121 and 122/125; GS 400.01 and 400.02; and all courses selected as Technical Elective Courses, earning a grade of C or better in each retake. Some or all K credits may also be required to be retaken, based on evaluation. Each course can be retaken only once. The student must remain out of the program for at least one academic year; however, if the student earns a B or better in each retake, the student can be reinstated as soon as all retakes are completed. In addition, the Undergraduate Studies Committee may require that specific measures be undertaken to resolve personal or financial problems that may have contributed to the student's academic difficulties.

When a reinstated student fails to fulfill the conditions of reinstatement, she/he is **dismissed the second time** from the program and will not be allowed to reenter the program, except under the conditions of the five year Fresh Start Rule (3335-7-261).

A student who has attained a PHR of at least 2.0 in the pre-Geomatics Engineering Core, but who has previously been dismissed by another engineering department, will be required to follow the same remedial procedures required of previously dismissed Geomatics Engineering students before being admitted to the Geomatics Engineering program.

A student who has been dismissed two or more times from the College of Engineering Department(s) for academic reasons will not be eligible for reinstatement or entry into the department, except under the conditions of the five year Fresh Start Rule (3335-7-261).

APPEAL PROCESS

1. In special circumstances a student on Special Action Probation may appeal to the Undergraduate Studies Chair in writing to drop a course giving reasons that may adversely affect his/her performance.

2. A student dismissed for the first time may appeal to the Undergraduate Studies Chair in writing to be reinstated in to the GE program.

3. A reinstated student, under circumstances beyond his/her control, may appeal to the Undergraduate Studies Chair in writing to adjust the course load for a certain quarter.

4. In case the second dismissal conditions cannot be duly resolved with the Undergraduate Studies Committee, a student may appeal to the Chair of the Civil and Environmental Engineering and Geodetic Science Department.

5. If the student finds review by the Chair unsatisfactory, she/he may appeal directly to the Academic Standards and Progress Committee (ASAP) through the College of Engineering's designee to that Committee.

NOTIFICATION - The Undergraduate Curriculum Guide outlining departmental probationary and dismissal policy is distributed to the Engineering Survey class every autumn. A copy of the Curriculum Guide is given to every student applying to the Geomatics Engineering major and the departmental **Special Action Probation and Dismissal** policy is discussed in detail with them. A copy of the Geomatics Engineering Curriculum Guide is also given to students transferring from other departments into the Geomatics Engineering program. The Curriculum Guide outlining the Department's probationary and dismissal policy is also on the department's web for everyone to view.

I have read and understood the Geomatics Engineering major's Academic Standards and Reinstatement of Dismissed Students policy.

_____ _____

Student's Signature *Date*

Geomatics Engineering Program
Department of Civil and Environmental Engineering and Geodetic Science

ACADEMIC ADVISING

Entry into major. Students may enter the BSGE major in the **autumn** quarter by submitting an Application to Major form to the Departmental Advisor, by the end of the spring quarter prior to the autumn quarter they desire to enter the major. Click here for the Application to Major Form. Students will meet with the Departmental Advisor to submit the Application to Major, which includes completion of a Course Projection Worksheet. A copy of the Worksheet will be given to the student, and the original will be kept in their Departmental file. The student will also select a Tentative Major Option and be assigned a Faculty Advisor in that Option.

Orientation upon entering the major. Presentations will be made on the various Geomatics Engineering Major Options in GS 400.01/.02. Students will be informed about the Technical Communications Portfolio concept used to meet GEC and ABET communication skills requirement. The principles underlying the integrated design project, culminating in GS 540, 541 and 542, the Senior Project, will also be introduced.

First quarter meeting with Faculty Advisor. During the **third week of the first quarter** that they are in the major, students will meet with their Faculty Advisor to discuss their academic and professional development in Geomatics Engineering. At this meeting, the Faculty Advisor will also evaluate and sign the student's Course Projection Worksheet. The student will return the Worksheet to the Departmental Advisor. Registration Windows will be locked for students who have not completed this form by the end of the third week of the quarter.

Second quarter meeting with Faculty Advisor. Students will have a meeting with their Faculty Advisor during the **third week of their second quarter** in the major. At this meeting they will discuss the student's academic and professional progress, and the student will be assisted in evaluating their choice of a Major Option. If the student continues in the Major Option selected when entering the major, the student will keep the same Faculty Advisor. If, after further discussions with faculty members in other Major Options, the student decides to change Major Option, the Departmental Advisor will assign the student a new Faculty Advisor in their permanent Major Option. In conjunction with their Faculty Advisor and prior to the end of their second quarter in the major, students will complete a Technical Elective Approval Form. Click here for this form. The signed form must be taken to the Departmental Advisor by the third week of the second quarter in the major, who will place it in the student's Departmental file. The student will also receive a copy.

Subsequent meetings with the Faculty Advisor. During subsequent quarters in the major, students will maintain appropriate contact with their Faculty Advisor. At a minimum, students must demonstrate that at least one additional meeting has been held.

Third Meeting with Faculty Advisor when applying to graduate. Three quarters in advance of graduation, students will complete the Application to Graduate forms. Click here for the Application to Graduate form, instruction to complete Application, and deadlines to submit the application. ***Students must have faculty advisor's signature on the Application to Graduate form before submitting to the Undergraduate Office in HI 475.*** Among other things, the student and Faculty Advisor will discuss their professional goals after graduation and the importance of taking the Fundamentals of Surveying (FS) Exam.

Fourth Meeting with Faculty Advisor. You will have a follow up meeting with your faculty advisor by the third Friday of the quarter prior to your graduation and have your advisor sign off on the copy of the technical elective approval form given to you during your second quarter in the major and return this form to HI475.

Locked windows. Students are urged to meet all the deadlines described above. Failure to meet these deadlines will result in the student's Registration Window being locked, thus students risk losing their priority to register for courses within their window time.

Geomatics Engineering Program
Department of Civil and Environmental Engineering and Geodetic Science

TRANSFER CREDIT EVALUATION

Procedure for Evaluation of Geomatics Engineering Courses – UNDERGRADUATE CREDIT TRANSFER

The following information/documents are **required** for **EACH GEOMATICS ENGINEERING COURSE** that needs to be evaluated and should be submitted to Cara, 475 HI, 2070 Neil Avenue, Columbus, OH 43210.

- Course syllabus listing text book(s) used and course content.
- Copy of transcript from the University where the course was taken, showing the grades received for the course;
- Copy of OSU credit evaluation form from the Admissions Office indicating how course(s) have been evaluated, *e.g.* CE Gen, Spl, or Def
- A cover letter addressed to the Undergraduate Studies Chair indicating the current GE course(s) for which you are seeking transfer credit along with your telephone number and an e-mail address (if available) and/or a phone number where you can be reached in case of questions.

Evaluation of transfer credit is not done on a walk-in basis. Generally, the evaluation will be completed within two to three weeks.

NON-ENGINEERING TRANSFER CREDIT COORDINATORS

Major	Name	Address	Phone	Fax
Chemistry	Mary Bailey, bailey.3@osu.edu	100 Celeste, 120 W. 18th Ave.	292-1204	292-1685
Engineering	Dr. Gustafson, enginee.1@osu.edu Dr. Demel, enginee.1@osu.edu	122 Hitchcock, 2070 Neil Ave. 244 Hitchcock, 2070 Neil Ave.	292-0573 292-2427	 292-9379
En Graphics	Prof. Croft, croft.3@osu.edu	240 Hitchcock,2070 Neil Ave.	292-6230	292-3780
Mathematics	Judy Berenstein Diana Bevilacqua Judy Monson	105 Mathematics Bldg, 231 W 18th Ave.	292-6994	292-0167
Physics	Dr. Adelson, adelson@mps.ohio-state.edu	1036A Smith Lab, 174 W. 18th Ave.	292-2067	292-7557
English	Eddie Singleton (Comp.), singleton.1@osu.edu Carolyn Wilkins (Comp.), wilkins.8@osu.edu Sharyn Talbert (Lit.), talbert.1@osu.edu Christopher Highley (Lit.), highley.1@osu.edu	421 Denny Hall,164 W. 17th Ave	292-6065	292-7816

COLLEGE OF ENGINEERING TRANSFER CREDIT COORDINATORS

Major	Name	Address	Phone	Fax
Aero/Astro	Sandra Rhoads, rhoads.20@osu.edu	328 Bolz Hall, 2036 Neil Ave.	292-2691	292-8290
Agriciculture	Mike Lichtensteiger, lichtensteiger.2@osu.edu	216 Ag Build, 590 Woody Hayes Dr.	292-9351	292-9448
Aviation	Chuck Patterson, patterson.13@osu.edu	401 Aviation, 164 W 19th Ave.	292-2405	
Chemical	Dr. Jim Rathman, rathman.1@osu.edu	221D Koffalt, 140 w 19th Ave.	292-3760	292-3769
Civil	Cara Collmer, collmer.1@osu.edu	475 Hitchcock Hall, 2070 Neil Ave	292-2005	292-3780
Cpt Sci & Eng	Debbie Gross, gross.142@osu.edu (100, 101, 200) David Mathias dmath@cse.ohio-state.edu (programming)	489 Dreese, 2015 Neil Ave. 497 Dreese, 2015 Neil Ave.	292-7946 292-6653	292-2911 292-2911
Electrical	Don Kasten, kasten.1@osu.edu	207 Caldwell Lab, 2024 Neil Ave.	292-1901	292-7596
Eng Physcis	Robert Scherrer, scherrer.1@osu.edu	1024 Smith, 174 W 18th	292-8523	292-7557
Industl & Sys	Clark Mount-Campbell	286 Baker Systems, 1971 Neil Ave	292-7856	
Mat. Science	Charles Drummond, Drummond@msn.eng.ohio-state.edu	388 Watts, 2041 College Rd.	292-6732	
Mechanical	Rosie Quinzon-Bonello, quinzon-bonello.1@osu.edu	E543 Scott Lab, 201 W. 19th Ave.	292-0515	688-5476
Geomatics Eng	Bill Hazelton. hazelton.5@osu.edu	222B Bolz, 2036 Neil Ave	292-7123	292-2957
Welding	Charles Albright, Albright.4@osu.edu	110 Edison Joining Tech. Ctr., 128 Adams Dr.	292-2570	292-6842

SENIOR PETITION – PROCEDURE

GRADUATE CREDIT FOR UNDERGRADUATES

An undergraduate may petition to take courses for graduate credit provided that:

1. the student is a senior (Rank 4);
2. the credit for the course is not used to meet baccalaureate degree requirements;
3. the student's cumulative point-hour ratio is 3.00 or above;
4. the student completes a Senior Petition form and secures permission by the end of the **first day of classes** from:

    - the secretary of the student's college or school (HI 122)
    - the instructor in charge of the course and
    - the Graduate School (247 University Hall)

5. the course is offered for graduate credit

These courses may not be counted toward a graduate degree until the student has been admitted to the Graduate School and until the Graduate Studies Committee accepts them and notifies the Graduate School. The hours are counted in the student's graduate earned and cumulative credit hour, and the grades are counted in the student's graduate cumulative point-hour ratio. No more than **fifteen** (15) graduate credit hours may be completed under *Senior Petition*.

Geomatics Engineering Program
Department of Civil and Environmental Engineering and Geodetic Science

Geomatics Engineering Sample Curriculum*– 2006-2007

Name: _____ SSN: _____ Email: _____@osu.edu

YR	AUTUMN		WINTER		SPRING	
1	Math 151 (Calc & Analy Geom)	5	Math 152 (Cal & Analy Geom)	5	Math 153 (Calc & Analy Geom)	5
	Eng 181 (Intro to Eng I)	3	Physics 131 (Particles & Motion)	5	Physics 132 (Electr & Magnetism)	5
	ENG 100 (Eng Survey)	1	Eng 183 (Intro to ENG II)	3	EnGraph 167C (Prob Solv Prg Eng)	4
	GEC	5	GEC	5	GEC	5
2	Math 254 (Calc & Analyc Geom)	5	Stats 145 (Intro to Pract of Stat)	5	**GS 450** (Spatial Data Adj I)	4
	Geod Sci 400.01 (Intro to Survey)	2	*C&RP 310* (Intro to C&RP)	4	EG 410A (Engineering CAD)	3
	Geod Sci 400.02 (Intro photogrm)	2	Math 568 (Intro Linear Algeb)	3	Chem 121 (Gen Chem)	5
	GEC	5	***GS 410*** *(Spatial Data Anal)*	4	GEC	5
3	***GS 560*** (History of Surveying)	3	***GS 561*** (Boundary Surveying)	4	***GS 562*** (Subdivision Design)	3
	GS 607 (Fund Geog Info Sys)	5	**GS 603** (RemteSensing Envr)	4	**GS 629** (Digital Photogram I)	4
	BusFin 510 (Legal Envr of Bus)	4	ME 410 (Statics)	4	***GS 625*** (Cadastral Info Sys)	4
	GS 550 (Spatial Data Adj II)	3	*BusFin 775* (Real Estate Law)	4	GEC	5
	Technical Elective	3				
4	**GS 563** (Land Info Mngmnt)	4	**GS 521** (Geod Measurmnt)	4	**GS 542** (Sr Project III)	2
	Physics 133 (Elctrdynmc &Quant)	5	**GS 636** (Map Projections)	4	**GS 575** (Prof. Practice)	2
	GS 540 (Sr Project I)	1	**CE 576** (CE Econ & Plan)	4	**GS 608** (Intro to GPS)	3
	GEC	5	**GS 541** (Sr Project II)	1	Technical Elective	7
			Technical Elective	8	GEC	5

Courses printed in BOLD are taught one quarter per year. Please check the On-line Course Offerings for prerequisites. Those with credit for EG 166 must take ENG 185, 186 or 187 after consulting with the Academic Advisor. Courses printed in *italics* are required to take the FS exam.

GENERAL EDUCATION (40 hrs)

English & Communication Skills (10 hrs)

English 110 (5) ____
2nd Writing Course (5) ____
3rd Writing Course(GeodSci 625) (4) ____

Ethics (5)

_____ (5) ____

Arts & Humanities (15-20)

a. Historical Survey (10)

_____ ( ) ____
_____ ____

b. Analysis of Text and Works of Art (5-10)

_____ ( ) ____

Social Sciences (5-10)

Econ 200 (Required) ( ) ____
_____ ( ) ____

Social Diversity

(may overlap with another GEC category).

_____ ( ) ____

TECHNICAL ELECTIVES (18 hrs)

_____ ( ) ____
_____ ( ) ____
_____ ( ) ____
_____ ( ) ____
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_____ ( ) ____
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_____ ( ) ____
_____ ( ) ____

Sub-total Core

Pre-GE…….	**35**
Geomatics Core ……	**105**
General Education…….	**40**
Technical Electives……	**18**
TOTAL HOURS	**198**

Acceptance into the Geomatics Engineering major is limited to 60 students per year. Admission to the Geomatics Engineering program requires a minimum cumulative point-hour ratio (CPHR) of 2.0 as well as a minimum secondary point-hour ratio (SPHR) of 2.0 in the following pre-major courses: *Math 151, 152, 153; Physics 131, 132; Engineering 181, 183 and En Graph 167C.* English 110 and ENG 100 also must be completed. Students are accepted into the major in Autumn quarter only. Formal application is required. See the departmental office (HI 475) for application details.*It should be emphasized that this is merely a suggested quarterly plan to be used as a starting point for planning coursework and should be readjusted according to the individual needs of the student. Any student who wants help in adapting this plan to his/her needs should see the Undergraduate Adviser in 475 Hitchock Hall.