UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. Detailed instructions for the proposal should be followed. A checklist is available to assist in the preparation of a proposal. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Tracy DeLiberty  
phone number: 831-4084

Department: Geography  
email address: tracyd@udel.edu

Date: 28 October 2015

Action: Revise Graduate GIS Certificate Program  
(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term: 16F  
(use format 04F, 05W)

Current degree  Certificate  
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: Certificate  
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: No name change  
Proposed new name for revised or new major / minor / concentration / academic unit  
(if applicable)

Revising or Deleting:

Undergraduate major / Concentration:________________________________  
(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor:________________________________  
(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change:________________________________  
(Must attach your Graduate Program Policy Statement)

Graduate Program of Study: Revise Graduate GIS Certificate Program  
(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration:________________________________

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, either describing the new program or highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations)?  
(Be aware that approval of the curriculum is dependent upon these courses successfully passing through
the Course Challenge list. If there are no new courses enter “None”)

None

Supply support letter from the Library, Dean, and/or Department Chair if needed (all new majors/minors will need a support letter from the appropriate administrator.)

Supply a resolution for all new majors/programs; name changes of colleges, departments, degrees; transfer of departments from one college to another; creation of new departments; requests for permanent status. See example of resolutions.

Explain, when appropriate, how this new/revised curriculum supports the 5 goals of undergraduate education: http://www2.udel.edu/gened/

Identify other units affected by the proposed changes: (This would include other departments/units whose courses are a required part of the proposed curriculum. Attach permission from the affected units. If no other unit is affected, enter “None”)

Other units are not affected.

Describe the rationale for the proposed program change(s): (Explain your reasons for creating, revising, or deleting the curriculum or program.)

The Graduate GIS Certificate began emitting students in spring 2010 and has graduated nearly 20 students. Over the last five years, we have found the 3 separate tracks to be too restrictive in the types of courses students select to complete. To date, all of the students who have graduated with the Certificate have followed the Analyst track. The Department also has a number of new courses that expand the GIS course offerings that cross more than one track. We propose to alter the requirements so that one course is required along with the selection of 9 elective GIS credits. The required GIS course is Geog670 Geographic Information Systems and Science that provides the theoretical basis of GIS and introduces the basic software techniques. The selection of the 9 additional graduate GIS credits is to be accomplished in consultation with an advisor to match the student’s interests and skillset they wish to accomplish with the certificate.

Program Requirements:
(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and include a side-by-side comparison of the credit distribution before and after the proposed change.) See example of side by side.

<table>
<thead>
<tr>
<th>Graduate Certificate in Geographic Information Science</th>
<th>Proposed Revisions to Graduate Certificate in Geographic Information Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Certificate of Geographic Information Science (GIS) is designed for working professionals aspiring to leadership positions in the field and wishing to obtain a certificate of GIS specialization. The Program first requires two core courses that provide a student the theoretical underpinnings of GIS to make informed use of geographic technologies, followed by the selection of one of three tracks – Technician, Analyst and</td>
<td>The Certificate of Geographic</td>
</tr>
</tbody>
</table>

Developer – to gain the technical skills needed to construct and solve problems in the physical and social realms.

The GIS Certificate Program is designed to meet the education needs of both traditional and non-traditional students. For traditional students, the GIS Certificate program prepares them to utilize GIS in their major areas of studies, while non-traditional students can take advantage of the GIS Certificate program to learn and/or upgrade their GIS knowledge and skills that are applicable and important to their professions.

The GIS Certificate program can be completed in one academic year. All students enter the program taking the introductory GEOG 670 course and proceed by choosing courses to fulfill the requirements of one of the three tracks. To receive the GIS Certificate, students must complete 12 credits of GIS coursework that includes:

<table>
<thead>
<tr>
<th>Certificate Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 670 Geographic Information Systems and Science</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose one Track to follow to complete 9 additional credits.

**Technician**
4 courses from Practical Skills
2 credits from Application Development
1 course from Applied GIS

**Analyst**
3 courses from Applied GIS

**Developer**
1 course from Practical Skills
5 credits from Application Development
1 course from Applied GIS

**Practical Skills Courses**
GEOG 672 Using ArcGIS and Open Source GIS
Computer
Cartography
SQL and Querying in GIS

Information Science (GIS) program provides a comprehensive professional certificate that balances work in the theoretical aspects of GIS, the technical side of the discipline, and the applications domain. Students are exposed to cutting-edge technology, with a focus on building invaluable problem-solving skills, and the opportunity to work on real-world GIS projects centered on their research interests.

The GIS Certificate is designed for working professionals and current graduate students aspiring to leadership positions in the field and wishing to obtain a GIS specialization. The Program requires one core course that provides the theoretical underpinnings of GIS to make informed use of geographic
Developing Geoprocessing Models 1
Developing Feature Creation and Editing in the ArcGIS Model 1
GEOG 666 Special Problems: approved online ESRI courses 1

Application Development Courses
CIEG 675 Matlab for Engineering 1
GEOG 605 Computer Programming for Environmental Research 3
GEOG 672 Using Python in a GIS Framework 1
Introductions to Scripting and Visual Basic in ArcGIS 1
Developing Geoprocessing Scripts 1
Developing Applications with GIS Web Servers 1
GEOG 666 Special Problems: approved online ESRI courses 1

Applied GIS Courses
FREC 680 GIS in Natural Resource Management 4
FREC 682 Spatial Analysis 3
GEOG 604 GIS for Environmental Sciences 3
GEOG 671 Advanced Geographic Information Systems 4
GEOG 677 Spatial Data Analysis 3
MAST/GEOG 681 Remote Sensing of the Environment 3
STAT 657 Statistics for Earth Sciences 3
UAPP 652 Public Policy 3
UAPP 655 GIS in the Public and Nonprofit Sector 3

Admission Requirements

This program is intended to function as means for graduate certification, so the minimum requirements for admission are a bachelor’s degree. For students not currently enrolled in a UD graduate program, a regular graduate application form is required. Applicants must include a brief statement of purpose and arrange for two letters of recommendation to be sent, along with transcripts from previous universities. Applicants whose previous degrees included no evidence of instruction in English should also include technologies, followed by the selection of 9 elective geographical technology credits – to gain the technical skills needed to construct and solve problems in the physical and social realms.

The GIS Certificate Program is designed to meet the education needs of both traditional and non-traditional students. For traditional students, the GIS Certificate program prepares them to utilize GIS in their major areas of studies, while non-traditional students can take advantage of the GIS Certificate program to learn and/or upgrade their GIS knowledge and skills that are applicable and important to their professions.

The GIS Certificate program can be completed in one academic year. All students enter the program taking
TOEFL scores. No GRE scores are required. Applications will be reviewed on an ongoing basis for admission in any semester. Applicants will be evaluated in terms of likelihood of success and availability of seats in our courses.

Students currently enrolled in a UD graduate program should complete a “Change of Classification Form” to seek approval to add the certificate program. This should be accompanied by a letter of support from the student’s advisor.

Students are required to choose an appropriate advisor associated with the certificate program, or have an appropriate advisor appointed by the Director of the Certificate Program, who will be the primary contact for questions. The Director of the Certificate Program will verify that the student has completed the requirements for the certificate and will approve the will approve the application for the certificate upon successful completion of the requirements.

<table>
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<tbody>
<tr>
<td>GEOG 670 Geographic Information Systems and Science</td>
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<tr>
<td>Complete 9 GIS graduate credits from the suite of courses below in consultation with a GIS advisor. The GIS Certificate Director may grant approval of a techniques course offered that is not on the list below.</td>
</tr>
<tr>
<td>APEC682 Spatial Analysis of Natural Resources</td>
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<tr>
<td>CIEG 675 MapLab for Engineering Analysis</td>
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<tr>
<td>GEOG604 GIS for</td>
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<tr>
<td>Course Code</td>
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<tr>
<td>GEOG605</td>
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<tr>
<td>GEOG671</td>
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<td>STAT657</td>
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<td>STAT659</td>
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<tr>
<td>UAPP652</td>
</tr>
<tr>
<td>UAPP655</td>
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</table>

**Admission Requirements**

The minimum requirement for admission to the Graduate GIS Certificate Program is a
bachelor’s degree. For students not currently enrolled in a UD graduate program, a regular graduate application form is required. Applicants must include a brief statement of purpose and arrange for two letters of recommendation to be sent, along with transcripts from previous universities. Applicants whose previous degrees included no evidence of instruction in English should also include TOEFL scores. No GRE scores are required. Applications will be reviewed on an ongoing basis for admission in any semester. Applicants will be evaluated in terms of likelihood of success and availability of seats in our courses.

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Submit a “Form” to seek approval to add the certificate program. This should be accompanied by a letter of support from the student’s advisor.

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ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson ___________________________ Date 11/9/15

Dean of College ___________________________ Date 11/13/15
(By signing above, the Dean confirms that their college policies and bylaws have been followed correctly during consideration of the request described in this form.

The approval actions that were taken at the college level were (check all that apply):

- college faculty vote
- college curriculum approval
- college senate approval

Chairperson, College Curriculum Committee ___________________________ Date 11/13/15

Chairperson, Senate Com. on UG or GR Studies ___________________________ Date

Chairperson, Senate Coordinating Com. ___________________________ Date

Secretary, Faculty Senate ___________________________ Date

Date of Senate Resolution ___________________________ Date to be Effective

Registrar ___________________________ Program Code ___________________________ Date

Vice Provost for Academic Affairs & International Programs ___________________________ Date

Board of Trustee Notification ___________________________ Date

Revised 9/22/2015/dhs