**Program Modification Form**

<table>
<thead>
<tr>
<th>Department/program</th>
<th>Geography, MS in Geography w. option in Cartography/GIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>Reduce the number of required courses and increase the number of elective courses. Total credits are not affected.</td>
</tr>
</tbody>
</table>

| Requestor:         | Anna Klene  
|                    | Christiane von Reichert  
|                    | 243-4347; 243-4784 |
| Phone:             |                                                      |
| Program Chair/Director: | Sarah Halvorson  |
| Department Dean:   | Chris Comer                                      |
| Other affected Programs: | No other affected programs |

**Please type / print name** | **Signature** | **Date**
-----------------------------|----------------|-----------
Anna Klene                 |               | 9-7-2010  
Christiane von Reichert    |               |           
Sarah Halvorson            |               |           
Chris Comer                |               | 9-8-2010  

Are other departments/programs affected by this modification because of:
(a) required courses incl. prerequisites or corequisites,  
(b) perceived overlap in content areas  
(c) cross-listing of coursework

Please obtain signature(s) from the Chair/Director of any such department/program (above) before submission

(e.g. adding a writing course required of all majors) Please X check the appropriate box.

<table>
<thead>
<tr>
<th>Major</th>
<th>Minor</th>
<th>Option</th>
<th>Teaching major/minor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>Please describe</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you are proposing a change to an existing program or major, please cut and paste the requirements as they appear in the current catalog below.

www.umt.edu/catalog

Please provide the proposed copy as you wish it to appear in the catalog.

Please explain/justify the new proposal or change.

Currently, the Cartography/GIS option (MS Geography) requires a considerable set of credits leaving no choice for elective credits for students on thesis or professional paper tracks. We propose to increase flexibility by increasing choices. Total credits and the catalog text will not change. The change affects our advising brochure, to which we link from our website.
Current: Cartography/GIS Option

Core Geography Courses for M.S. with option in Cart/GIS (5-11 credits depending on Track)

<table>
<thead>
<tr>
<th>Track/Course</th>
<th>Geog 500(2)</th>
<th>Geog 504(1)</th>
<th>Geog 505(2)</th>
<th>Geog 520(3)</th>
<th>Methods (3+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thesis</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Prof. Paper</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Non Thesis</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Required Courses in the Cartography/GIS Option (23 credits)

- Gphy 486-3 Transport, Planning, and GIS
- Gphy 489-1 Laboratory (with Gphy 486)
- Gphy 487-3 Remote Sensing and Raster GIS
- Gphy 489-1 Laboratory (with Gphy 487)
- Gphy 488-3 Thematic Cartography and GIS
- Gphy 489-1 Laboratory (with Gphy 488)
- Gphy 580-3 Seminar in GIS and Cartography
- Gphy 587-3 Digital Image Analysis and Modeling
- Gphy 589-1 Laboratory (with Gphy 587)
- Gphy 588-3 Vector GIS (Geog 588-3)
- Gphy 589-1 Laboratory (with Gphy 588)

Electives

- Gphy 467-3 Planning Decision Support Systems
- Gphy 468-3 Community and Regional Analysis
- Gphy 469-1 Laboratory (with Gphy 468)
- Gphy 482-3 Spatial Analysis and GIS
- Gphy 485-3 Internet GIS
- Gphy 489-1 Laboratory (with Gphy 485)
- Gphy 495-3 Digital Mapping & Design
- Gphy 598-3 Internship (Geog 598-3)
- For 551-4 Digital Image Processing

Other electives may be chosen in consultation with the advisor.

Proposed: Cartography/GIS Option

Core Geography Courses for M.S. with option in Cart/GIS (5-11 credits depending on Track)

<table>
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<tr>
<th>Track/Course</th>
<th>Geog 500(2)</th>
<th>Geog 504(1)</th>
<th>Geog 505(2)</th>
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<td>Thesis</td>
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<td>Non Thesis</td>
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<td></td>
<td></td>
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<td>X</td>
</tr>
</tbody>
</table>

Required Core Courses (11 credits)

- Gphy 487-3 Remote Sensing and Raster GIS
  - Gphy 489-1 Laboratory (coreq with Gphy 487)
  - Gphy 488-3 Thematic Cartography and GIS
  - Gphy 489-1 Laboratory (coreq with Gphy 488)
  - Gphy 580-3 Seminar in GIS and Cartography

Select one of the following two courses w. co-requisite lab (may take other course as elective; 4 credits)

- Gphy 486-3 Transport, Planning, and GIS
  - Gphy 489-1 Laboratory (coreq with Gphy 486)
  - Gphy 468-3 Community and Regional Analysis
  - Gphy 469-1 Laboratory (coreq with Gphy 468)

Electives (8-20 credits depending on Track; depending on Track, at least 3-10 credits must be at the 500 level)

- Gphy 467-3 Planning Decision Support Systems
- Gphy 482-3 Spatial Analysis and GIS
- Gphy 485-3 Internet GIS
  - Gphy 489-1 Laboratory (with Gphy 485)
  - Gphy 495-3 Digital Mapping & Design
  - Gphy 587-3 Digital Image Analysis and Modeling
  - Gphy 589-1 Laboratory (with Gphy 587)
  - Gphy 588-3 Vector GIS (Geog 588-3)
  - Gphy 589-1 Laboratory (with Gphy 588)
  - Gphy 598-3 Internship
  - For 503-3 Predictive Distribution Modeling
  - For 551-4 Digital Image Processing
  - WBio 562-3 Wildlife Habitat Modeling

Other electives may be chosen in consultation with the advisor.