Minutes of the Graduate Faculty Council Meeting

Tuesday, February 5, 2013

**Members** (13): Thomas Drummer (Math), Keat Ghee Ong (Biomed), Craig Friedrich (MEEM), Zhenlin Wang (CompSci), Greg Waite (Geo), Kari Henquinet (PCorps), Erika Hersch-Green (BioSci), Kim Fook Lee (Phys), Ashutosh Tiwari (Chem), Noel Urban (Envir), Mike Bowler (Rhet), Eugene Levin (SOT), Audry Mayer (SocSci)

**Guests** (7): Jacqueline Huntoon (Grad Sch), Debra Charlesworth (Grad Sch), Nancy Byers-Sprague (Grad Sch), Kevin Cassell (GSG), Sarah Lucchesi (Lib), Terry Sharik (SFRES), Heather Suokas (Grad Sch)

1) Meeting called to order at 4:05 pm.

2) Review and approval of 01/15/13 meeting minutes.

3) Committee Reports:
   - Graduate Tuition and Stipend Review Committee (Dean Huntoon): The report was discussed.

4) Old Business:
      Last month the council was asked to bring the proposal to their departments and come to this meeting prepared to vote.
      - (C): There is a call for a non tenure track position.
      - (Q): Is this intended to be an accelerated master’s program?
      - (A): Yes, that was one of the reasons for this degree proposal. There are currently ten students interested in joining this program upon its approval. The students realize how many more job opportunities will become available to them.
      - (C): Dean Huntoon clarifies that in the past proposals would be brought to dean’s council, on to GFC, and then to Senate. Because we are already in spring semester and time is short, the Provost asked that the GFC and the Senate Academic Policy Committee consider this proposal concurrently. Comments from GFC will be merged with comments received from Academic Policy and then the revised proposal will go to the Senate.
      - (Q): Is FW5554 an existing course? Can any student take this course even if they are not in this program?
      - (A): The course number is new but the course itself exists in part already as part of Forestry’s field camp. Yes, any student can take it.
      - (D): Motion to approve the proposal passed.
   b. Proposal for Determining When International Students Need ESL Services (Dean Huntoon): Will be discussed at the next GFC meeting.
   c. Proposal for Allowing Multiple Attempts at Oral Exams (Dean Huntoon): **TO DO:** Please take the proposal (find on handouts section of the GFC website) back to your departments and bring feedback to the next GFC meeting.

5) New Business:
   a. Proposal to Modify (revenue-neutral modification) Research Only Mode (P. Moran): The proposal is to change the following three things - name from “Research Only Mode” to Dissertator Mode”, allow all students in this mode to take up to three credits of advanced graduate electives each semester at no extra cost if there are seats available in the class and if their advisor approves, increase the cost of the nine mode credits so that the revenue going into the grad tuition pool is no less than it is now with the small fraction of the research only mode students who take extra electives and pay for them. The increase would be fifty dollars more per
student. An unintended consequence of the present policy is that students are not taking advanced graduate elective courses (either because they are unwilling to pay the expense themselves or because departments are unwilling to pay the expense). The proposed modification will show that Michigan Tech values continued learning.

- (Q): Would everybody in research only mode have to pay the additional fifty dollars? Would all departments have to pay this even if they rarely have students interested in taking additional courses?
- (A): Yes, even if a student does not take advantage of the additional courses, they or their department would still need to pay the extra charge.
- (Q): If the student has completed their coursework, why would they want to take an additional course?
- (A): Some courses beyond required classes are important to a student’s research or career goals.
- (C): The cost should not be transferred to everybody, especially to the student or department that is not going to take advantage of additional courses.
- (Q): Was any analysis conducted to predict how many students would actually take additional courses if they were free. What if many students take advantage of this opportunity and the extra fifty dollars no longer covers the expense.
- (A): No.
- (Q): The number of students should be monitored because if a lot of students take additional courses will there be another cost increase per student? Might it be better to offer students who want to take an additional course a reduced rate?
- (A): The goal is to get more students to take additional courses. Why would anybody correlate that with an increase in a loss of revenue?
- (Q): What if advisors get their students into research only mode so that they can take courses free of charge? This does create a loss of revenue.
- (A): No, it does not create a loss of revenue because to get to research only mode you have to take your required courses.
- (C): In Geology there are no course requirements.
- (Q): If it is important to a department or an advisor why don’t they just fund the student to take the additional course rather than impose this extra cost onto everybody?
- (A): Maybe we should get rid of research only mode then.
- (C): A process or form would need to be developed to ensure that the student received approval from their advisor.
- (Q): Would this be applicable to MS students as well as PhD students?
- (A): Yes.
- (C): The goal of research only mode is for our students to focus on their research.
- TO DO: Please take the proposal (found on the handouts section of the GFC website) back to your departments and bring feedback to the next GFC meeting.

6) Motion to adjourn at 5:02 pm.
February 5, 2013
(Last update: 02/13/13)

Handouts of the Graduate Faculty Council

Michigan Tech
ESL Services

01/31/13

Graduate School

Proposal

Some graduate students admitted with relatively low language test scores have difficulty understanding and communicating in English in their academic environments, and many have difficulty writing in English according to the standards and conventions of graduate work in US universities.

In order to address these problems:

- new graduate students admitted with scores below 79 TOEFL iBT should be evaluated upon arrival
- based on this evaluation and needs assessment, the ESL program should recommend appropriate support services.
Allowing Multiple Attempts at Oral Exams

1/25/13

Graduate School

Proposal

All students who must pass an oral examination associated with one of the following milestones required for completion of a degree are allowed up to two opportunities to successfully complete each required oral examination.1

- Qualifying Examination (test of disciplinary knowledge)
- Research Proposal Examination (test of capability to conduct independent research)
- Final Oral Defense (public defense of research)

Oral examinations can have one of the following outcomes:

- Pass
- Conditional pass
- Fail

Students who pass an oral exam are considered to have successfully completed the associated milestone. It is the responsibility of a student’s examination committee to communicate to both the student and the appropriate graduate program director and program assistant that the oral exam was successfully completed.

Students who conditionally pass an oral exam will not be considered to have successfully completed the exam until they have adhered to all of the specified conditions within the specified period of time. It is the responsibility of a student’s examining committee to clearly document in writing the conditions as well as the period of time the student has to address those conditions and to share this information with the appropriate graduate program director and program assistant. It is also the responsibility of the examining committee to monitor a student’s progress in completing all required conditions and to communicate to the student and the appropriate graduate program director and graduate program assistant when the conditions have been met. If a student fails to complete all of the conditions imposed within the specified period of time, it is the responsibility of the examining committee to notify the student and the appropriate graduate program director and graduate program assistant that the student has failed the exam. Students who fail to complete conditions within a specified period of time will normally not be given a second opportunity to take the oral exam. If a student has been unable to complete the conditions due to circumstances outside of the student’s control, the student can request an extension from the examining committee. If the student is unsatisfied with the decision of the examining committee, the student can appeal the decision to the appropriate graduate program director who will consult with the chair of the student’s academic home department and issue a final decision.

1 See: http://www.mtu.edu/gradschool/administration/academics/requirements/phd/ and http://www.mtu.edu/gradschool/administration/academics/requirements/ms/
Students who fail an oral exam on the first try can request an opportunity to repeat the exam one time. Requests must be made, in writing, to the student’s examining committee. Requests must explain why the student feels that a second opportunity is warranted. The student's examining committee will determine if a second attempt will be allowed based on the student's individual circumstances. If a second attempt is allowed, the examining committee must specify the time frame within which it must occur. If the student is unsatisfied with the examination committee’s decision, the student can appeal the decision to the appropriate graduate program director who will consult with the chair of the student’s academic home department and issue a final decision. It is the responsibility of a student's examination committee to communicate to both the student and the appropriate graduate program director and program assistant that the student failed an oral exam, whether or not the student requested a second attempt, whether or not a second attempt will be allowed, and the outcome of a second attempt if one is allowed.
Proposal for a professional Master of Geographic Information Science (MGIS)
Submitted by the School of Forest Resources and Environmental Science

Contact: Andrew J. Storer, Associate Dean, SFRES. storer@mtu.edu

1) Description and characteristics of program
The professional Master of Geographic Information Science (GIS) program will initially be administered in the School of Forest Resources and Environmental Science (SFRES). This program builds upon the School's existing professional Master's degree in Forestry and the expertise within the School in spatial information science. Over time, the program may become non-departmental as it grows and involves students from a broad range of academic backgrounds.

This program will provide current and cutting-edge education in Geographic Information Science and related technologies, and train students to work as GIS specialists and managers. A strong foundation in core geospatial principles will be provided, as well as interdisciplinary study in statistics, communications, environmental policy, and business. It is designed as a 30 credit coursework-only degree (Plan C) and will be offered as an accelerated Master's program to Michigan Tech graduates. As interest in 4+1 programs continues to develop, this program will provide the opportunity for our graduates to complete both a bachelor’s and master's degree in 5 years. The scheduling will allow students to complete this degree in three semesters (two semesters for students who have attended Michigan Tech and have certain prerequisites).

2) Rationale
Professional Master's degrees are consistent with the goals of Michigan Tech's strategic plan:

Goal 1: Learning

1.3: Offer programs in new and emerging areas, particularly interdisciplinary areas (e.g. bioinformatics, information technology). Strategies: offer ...fast-track professional master's degrees.¹

Geospatial jobs are in high demand, have exhibited continued growth even during the recent recession,² and were recently listed among the 100 best careers in the United States.³ Geospatial training has been targeted by the U.S. Department of Labor for a high growth job training initiative, as it is a field that is expanding at a rate of 10% annually with a projected shortfall of skilled workers⁴. Those with geospatial skills are included in a recent McKinsey Global Institute report on workers with “big data” expertise. Both analysts and managers are identified, with a potential deficit of 190,000 workers by 2018.⁵

Uses of geospatial technology are broad and cross many disciplines, including demographics, natural resources, urban and regional planning, public health and epidemiology, law enforcement, and homeland security.⁶ The classification of geospatial jobs has been inconsistent because GIS has many applications and is utilized in multiple fields. GIS positions are often associated and combined with Information Technology because GIS deals so intimately with computers and data. Though IT experience is useful for GIS users, a wide range of skills in addition to computer literacy are required to be a successful geospatial professional.
To address these shortcomings, and with prompting from both industry and the education sector, the U.S. Department of Labor has recently developed the Geospatial Technology Competency Model. The model document outlines the knowledge and skills necessary to perform as an effective GIS professional, and was used as a guide in developing this proposal.

3) Discussion of related programs within Michigan Tech and at other universities

The most closely related program at Michigan Tech is the Master of Science in Integrated Geospatial Technology, housed in the School of Technology (program information is available at http://www.mtu.edu/technology/graduate/igt/study/). The School of Technology's IGT M.S. is primarily a research-oriented degree with a focus on geospatial data acquisition and processing. In contrast, the professional Master of GIS is designed as a terminal degree for students not planning to earn a PhD or perform research. Rather, it is designed to give students the skills to work as GIS specialists or managers. The School of Technology's Integrated Geospatial Technology degree does offer a Plan C Masters as an option; however, it has different requirements for admission and will likely attract students with a surveying or engineering degree. The Master of GIS is designed for people with limited or no background in GIS and associated tools. Furthermore, the IGT M.S. has a significant distance learning component, whereas the Master of GIS will initially be offered primarily on-Campus with traditional lectures and supervised lab sessions.

Non-research Master’s in GIS are offered at a number of universities in the U.S., either on-Campus (e.g., Michigan State), online only (Penn State), or a mixture of online and on-Campus (UMD). A professional Master of GIS at Michigan Tech will be successful because 1) many of the students enrolled in the program will be Michigan Tech graduates pursuing the accelerated Master’s degree option and 2) no similar program is offered locally.

Presently, undergraduates at Michigan Tech in the School of Forest Resources and Environmental Science and students in the Surveying Engineering program in the School of Technology have a required geospatial component in their degree programs. GIS is taken as an elective in a number of other disciplines, as from biology, computer science, environmental engineering, geology, and social science frequently enroll in existing GIS courses.

Though the use of spatial tools is necessary to be a successful student in upper division SFRES classes, only one GIS and one GPS course are required for graduation – a total of five credits. These courses are enough to grasp introductory theory and learn the basics of a tool, but not enough to develop the broad and deep understanding of spatial theory and the applications necessary to work as a geospatial professional.

4) Projected enrollment

We project an annual enrollment of at least 10-15 students in this program. While some students will be drawn from other areas of the U.S. or from professionals in the region, most students will likely be recent undergraduates from Michigan Tech. The majority of Michigan Tech graduates coming into the program will likely have degrees from the School of Forest Resources and Environmental Science, or from other majors such as Environmental Engineering, Biological Sciences, Geology, or Social Science. Students with a background in any of these disciplines would also be a good fit with the MGIS degree.

We anticipate enrollment will be more or less continuous. Because this program will draw students that are largely self-funded, enrollment should be independent of general trends at the University. Enrollment in the Master of Forestry program has averaged 5 students annually over
the last 5 years. Current enrollment in SFRES is 271 (186 undergraduate and 85 graduate students).

5) Scheduling plans
Courses will be taught during regular daytime hours or in the evening. Over time, some of the courses will be adapted for web-based delivery, and perhaps as summer courses.

6) Curriculum Design
Students admitted to this program will have a B.S. in any discipline. The professional M.S. in GIS is designed to be completed in three semesters for students entering the program without prerequisites, but can be completed in two if six credits are counted from a Michigan Tech undergraduate degree under the accelerated Master's option. Once admitted, students must complete a minimum of thirty credits of coursework past their undergraduate degree. It is a Plan C (coursework only with required oral examination) Masters with no thesis or report options. Students will choose a faculty advisor from within the program.

**General Curriculum Design**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Introductory GIS</td>
<td>4 credits</td>
</tr>
<tr>
<td>Advanced GIS concepts</td>
<td>3 credits</td>
</tr>
<tr>
<td>Implementing and managing GIS projects</td>
<td>3 credits</td>
</tr>
<tr>
<td>GPS field techniques</td>
<td>2 credits</td>
</tr>
<tr>
<td>Remote sensing</td>
<td>3-4 credits</td>
</tr>
<tr>
<td>Communications</td>
<td>2 credits</td>
</tr>
<tr>
<td>Spatial Statistics</td>
<td>3 credits</td>
</tr>
<tr>
<td>Electives</td>
<td>9-10 credits</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30 credits</strong></td>
</tr>
</tbody>
</table>

The following courses are required (new courses are in **BOLD** and include the name or position of the instructor):

*Introductory GIS*

FW5550 - GIS for Resource Management (4 credits, Fall)

*Advanced Spatial Topics (GIS, GPS, cartography, data and project management)*

FW5554 – GPS field techniques (2 credits, Fall) (Professor of Practice)

FW5555 - Advanced GIS Concepts and Analysis (3 credits, Spring) (Maclean) Pre-requisite: FW5550

FW5556 - Implementing and Managing GIS Projects (3 credits, Spring) (Professor of Practice) Pre-requisite: FW5550
Spatial Statistics
FW5510 - Spatial Statistics (3 credits, Spring) (Falkowski and Professor of Practice (alternate years))

Remote Sensing
FW4540 - Remote Sensing of the Environment (3 credits - alternate Fall semesters) or
FW5540 - Advanced Terrestrial Remote Sensing (4 credits, alternate Fall semesters) or
FW5560 - Digital Image Processing: A Remote Sensing Perspective (3 credits, Spring) Pre-requisite: FW5550 or
GE4250 - Fundamentals of Remote Sensing (3 credits, Spring) Pre-requisites: PH2200 and MA2160 or
SU4140 - Photogrammetry (3 credits, Fall) Pre-requisite: SU2260

Communications
FW5801 – Masters Seminar in GIS (1 credit, Fall and Spring) (Professor of Practice)

Electives (select 10-11 credits from the following lists)
Business
BA5650 - Project Management (3 credits, Fall, Spring, Summer) Pre-requisite: MA2710 or MA 2720 or MA 3710
BA5760 - Corporate Social Responsibility & Business Ethics (3 credits, on demand)

Cartography
SS5XXX Critical Cartography (1 credit, Summer)

Computer Science
CS4421 - Database Systems (3 credits, Spring) Pre-requisite: CS2321

Communications and writing
FW5850 - Effective Grantsmanship Workshop (2 credits, Spring)
HU5081 - Writing Applications in Technical Communication (3 credits, on demand) NOT in the current course list
HU5091 - Writing for publication (3 credits, on demand)

Geospatial applications
UN4000 - Remote Sensing Seminar (1 credit, Fall & Spring)
FW3540 - Introduction to GIS for Natural Resource Management (4 credits, Spring) Pre-requisite: MA 2710 (C) or MA 2720 (C) or MA 3710 (C)
FW4545 - Map Design with GIS (3 credits, alternate Spring) Pre-requisite: FW3540 or FW5550
SU3540 - Geospatial Information Technology (4 credits, Spring) Pre-requisite: MA3710
SU5003 - GIS Fundamentals (1 credit, on demand)
SU5004 - Introduction to Geospatial Image Processing (3 credits, on demand)
SU5041 - Geospatial Data Processing (3 credits, on demand)

Policy

ENG5520 - Sustainable Futures II (3 credits, Spring)
FW5111 - Advanced Natural Resource Policy (3 credits, Fall)
FW5150 - Institutions and Natural Resource Management (up to 3 credits, Fall, Spring, Summer)

Natural resources

CE5666 - Water Resources Planning and Management (3 credits, on demand) Pre-requisites CE3620 and (EC3400 or EC3402 or ENT3402)
ENVE4505 - Surface Water Quality Engineering (3 credits, Fall) Pre-requisite: ENVE3501 or ENVE 3503
FW 4220 - Wetlands (4 credits, Fall)
FW4300 - Introduction to Wildland Fire (3 credits, Spring) Pre-requisite: FW3020 and (FW3010 or FW3012)
FW4370 - Forest and Landscape Hydrology (3 credits, Spring)
FW4380 - Landscape Ecology (3 credits, Spring)
FW5032 - Integrated Forest Inventory and Data Analysis (3 credits, Spring)
FW5088 - Forest Finance & Economics (3 credits, Spring)
FW5130 - Forest Vegetation Dynamics (3 credits, Fall) Pre-requisites: BL3400 or FW3010 or FW3012 or FW3020
FW5140 - Stable Isotopes in Ecology and Environmental Science (2 credits, Fall)
FW5413 - Sustainable Biomass (3 credits, Fall)
GE4150 - Natural Hazards (3 credits, Fall) Pre-requisites: (GE2000 or GE2100) and UN2002

Statistics

EC4200 - Econometrics (3 credits) Pre-requisites: (EC2001 or EC3002 or EC3003) and (BA2100 or BUS2100 or MA2710 or MA2720 or MA3710) and (MA1135 or MA1160 or MA1161)
FW5411 - Applied Regression Analysis (3 cr, alternate Spring semesters)
MA4710 - Regression Analysis (3 cr, Spring) Pre-requisites: MA2720 or MA3710
MA4740 - Sampling Methods (3 cr, on demand)
MA5701 - Statistical Methods (3 cr, Fall)
Example MS in GIS course sequence for a Michigan Tech BS degree holder

As an undergraduate, take FW3540 - Intro to GIS for Resource Management (4 credits) and FW5111 - Advanced Natural Resource Policy (3 credits). Six of these credits may be applied.

Fall
FW5550 - GIS for Resource Management (required)  (4 credits)
FW5554 - GPS Field Techniques (required)    (2 credits)
FW5801 - Masters Seminar in GIS (required)   (1 credit)
EC4300 - Econometrics                           (3 credits)
GE4150 - Natural Hazards                        (3 credits)
Total                                             13 credits

Spring
FW5555 - Advanced GIS Concepts and Analysis (required)  (3 credits)
FW5560 - Digital Image Processing (required from list) (3 credits)
FW5565 - Implementing and Managing GIS Projects (required) (3 credits)
FW5510 - Spatial Statistics (required)    (3 credits)
FW5801 - Masters Seminar in GIS               (1 credit)
Total                                             13 credits

Accelerated Master's credits       6 credits
Fall semester                  13 credits
Spring semester                13 credits
Total                         32 credits

Example MS in GIS course sequence for an external student

Spring
SU3540 - Geospatial Info Technology                  (4 credits)
FW5510 - Spatial Statistics (required)     (3 credits)
GE4250 - Fundamentals of Remote Sensing          (3 credits)
FW5801 - Masters Seminar in GIS (required)    (1 credit)
Total                                             11 credits

Fall
FW5550 - GIS for Resource Management (required)  (4 credits)
FW5540 – Adv.Terrestrial Remote Sensing (required from list) (4 credits)
FW5554 - GPS Field Techniques (required)    (2 credits)
GE4150 - Natural Hazards                        (3 credits)
Total                                             13 credits

Spring
FW5555 - Advanced GIS Concepts and Analysis (required)  (3 credits)
FW5565 - Implementing and Managing GIS Projects (required) (3 credits)
FW5850 - Effective Grantsmanship         (2 credits)
FW5801 - Masters Seminar in GIS             (1 credit)
Total                                             9 credits

Spring semester            11 credits
Fall semester              13 credits
Spring semester            9 credits
Total                     33 credits
7) New Course descriptions

**FW5554 – GPS Field techniques.** 2 credits, offered in Fall. This course will provide hands-on experience with various types of GPS units and different applications of the technology, including planning, data collection, data processing, and management. Emphasis will be on practical applications of global positioning system technology.

**FW5555 – Advanced GIS Concepts and Analysis.** 3 credits, offered in Spring. Enrollment priority will be given to students in the professional MS in GIS degree program, but will be open to students in other programs. This course moves beyond the fundamentals of GIS to explore the application of GIS technology to environmental problems. Students review current research in the field, learn relevant modeling techniques, and utilize advanced GIS software tools such as network analysis, 3D visualization, geodatabase management and rule construction, and multivariate spatial analysis. Prerequisite: FW5550 or permission of instructor.

**FW5556 – GIS Project Management.** 3 credits, offered in Spring. Enrollment priority will be given to students in the professional MS in GIS degree program, but will be open to students in other programs. This course will provide exposure to geospatial data collection using GPS (both consumer- and resource-grade GPS), database structures and data management strategies, spatial project planning and management, and cartographic techniques, and will include discussion of geospatial ethics. Development of a project database and geospatial portfolio is required. Prerequisite: FW5550 or permission of instructor.

**FW5801 – Masters Seminar in GIS.** 1 credit, offered in Fall and Spring. This course is designed for students in the professional MS in GIS degree program, but will be open to students in other programs. Students will discuss and present current research and applications of geospatial technology.

**SS5XXX Critical Cartography.** 1 credit, offered in Summer. This course will examine: available datasets for human variables; and the interpretation of maps based on scale, boundaries, projection system, and other information that affect messages regarding power and influence, and assumed relative importance of environmental, social and economic issues.

The other classes listed without full class numbers are currently in the binder process or are offerings under existing programs.

8) Library and other learning resources

No additional library resources are requested. Interlibrary loan and existing journals are adequate, especially as this is a professional, non-research program.

9) Computing access fee

No computer access fees per centralized IT. Additional course fees may apply.

10) Faculty Résumés

Yushin Ahn, School of Technology http://www.mtu.edu/technology/school/faculty/ahn/

Michael Falkowski, School of Forest Resources and Environmental Science http://www.mtu.edu/forest/about/faculty/falkowski/
11) Description of available / needed equipment

Existing teaching laboratory computers and GPS equipment in SFRES will be utilized. We currently maintain a 26-seat main computer lab, a 16-seat spatial teaching lab, and a 6-seat graduate computing lab. These facilities will be adequate to add the necessary one lab section per semester. Michigan Tech has maintained an annual site license for ESRI products (chiefly ArcGIS software) since 1997. ArcGIS is the most widely-used GIS software and will be the primary GIS application used in labs. SFRES also maintains a number of consumer- and mapping-grade GPS units for teaching and research, which will be available for use by students enrolled in the program.

12) Program costs, years 1 through 3

Three-year costs will be $201,000, with projected tuition revenue of $509,960 during the same period. Each year thereafter we project a surplus of tuition revenue over costs of between $100,000 and $180,000 per year. The major expense to the University will be support for a Professor of Practice who will serve as both coordinator of the program and as an instructor. While there are clearly additional costs in offering an additional program, the surplus of tuition revenue over costs is clearly more than sufficient to cover those costs. The Professor of Practice will manage the program, recruit and help advise graduate students, and teach courses (FW5554 3 credits, FW5556 3 credits, and FW5801 1 credit twice (total 7 credits each year) annually and FW3540 and FW5510 every other year average 4 credits per year). This represents approximately 60% of a full teaching load. The Professor of Practice is budgeted at 80% of an academic year (9-month) position. The Professor of Practice is therefore budgeted for 20% time coordinating the program (including recruiting, advising and developing the program). No additional faculty needs are anticipated.

Based on the projected enrollment of 10 students per year at 10 credits per semester, tuition revenue would total $149,000 annually – see table below. Tuition is as posted on the sponsored programs website, with costs for the coordinator averaging $67,000 (salary and fringe) for years 1–3. Based on the graduate tuition rate and 20 credits per student per year, 4.5 students enrolled annually would support this program as proposed.
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<tbody>
<tr>
<td>Professor of Practice (salary and fringe)</td>
<td>$65,000</td>
<td>$67,000</td>
<td>$69,000</td>
</tr>
<tr>
<td>Number of graduate students</td>
<td>6</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Tuition per credit</td>
<td>$789</td>
<td>$836</td>
<td>$886</td>
</tr>
<tr>
<td>Tuition revenue based on 20 credits per student per year</td>
<td>$94,680</td>
<td>$167,200</td>
<td>$248,080</td>
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<tr>
<td>Income developed from program</td>
<td>$29,680</td>
<td>$100,200</td>
<td>$179,080</td>
</tr>
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</table>

Note that in reality income is greater than shown in the table as students complete the remaining required credits either in a third semester (an additional 10 credits per student), or during their undergraduate degree through senior rule (an additional 4 credits per student).

13) Space
No additional space will be necessary. Based on projected enrollment, the existing teaching lab, open computer labs on campus, and graduate offices in SFRES will provide adequate space for the program.

14) Policies, regulations, and rules
No new policies or rules will be needed. All existing graduate school policies will be adhered to.
Applicants must meet all requirements for admission by the Graduate School and the School of Forest Resources and Environmental Science at the time of application, and must follow specified admission procedures. For international applicants, this includes submission of TOEFL scores. Applications will be considered using the existing process in SFRES, which includes faculty review of applications. In addition, the program coordinator will review applications. A combination of academic background, professional knowledge, the applicant's statement of purpose, letters of recommendation, and test scores required by the graduate school, will be considered before making a decision to admit a student.

15) Accreditation requirements
None. The program is, however, designed to provide training and skills identified in the Geospatial Technology Competency Model.
We anticipate that ultimately this program will be listed as a Professional Science Master’s program with an associated advisory board of professionals in the field, and that this designation will be used when promoting the program.

16) Internal status of proposal
In development, internal to SFRES, September 2012
Submitted for comment to all units with classes listed – revised November 2012

17) Planned implementation date
Fall semester of 2013

References
1 http://www.mtu.edu/stratplan/goals.html
5 http://www.mckinsey.com/Insights/MGI/Research/Technology_and_Innovation/
Big_data_The_next_frontier_for_innovation, page 30
6 http://americancityandcounty.com/technology/gis_gps/report_shows_trends_gis/
or http://gita.org/resources/geo_report/georeport.asp
8 http://www.geo.msu.edu/acad_prog/msgiscireq.html or
http://www.worldcampus.psu.edu/MasterinGIS.shtml and http://www.geog.umd.edu/gis/
A proposal to modify the rules for “Research Only” Mode in a revenue neutral manner so as to keep the present benefits of its alignment with our **GOALS** while making it more consistent with one of our **VALUES**

**OUR MISSION**: We prepare students to create the future.

**A COUPLE OF OUR GOALS**
- increase external support for research and scholarship;
- expand PhD. enrollments and degrees granted;

**ONE OF OUR VALUES: We Inspire Scholarship**
- We inspire world class scholarship through academics, research and continued learning.
Present form of rule supports our goals

• THE PRESENT POLICY
  – Once graduate students have completed all required coursework, passed their qualifier, and their preliminary exam in which they present their research proposal, they enter a mode where they can sign up for 9 credits at a third of the regular graduate tuition rate

• THIS IS A GOOD THING BECAUSE....
  – it allows students supported on externally funded research proposals to have more of the TIGHT externally funded research $$ that support them go to the supplies, equipment usage fees, travel, and other OVERHEADED expenses that are incurred, sometimes unexpectedly, in their research
  – It allows us to externally support more Grad students/research$
PRESENT FORM OF RULE HAS THE UNINTENDED CONSEQUENCE OF NOT BEING ENTIRELY IN SUPPORT OF ONE OF OUR VALUES

THE PRESENT POLICY

- Students in Research ONLY mode cannot sign up for ANY advanced graduate elective classes unless they pay full price for the number of credits of the advanced graduate elective class

AN UNINTENDED CONSEQUENCE OF THE PRESENT POLICY:
There is a financial disincentive for an advisor who has to support externally funded graduate students in research only mode on a tight budget to allow them to take any advanced graduate elective courses

THE RESULT:

THOUGH...

- We value continued learning, and
- There exists advanced graduate electives taught by experts in the topic with seats available, and
- Students may never again in their career have an opportunity to learn about these topics from these experts

VERY FEW GRADUATE STUDENTS IN RESEARCH ONLY MODE TAKE ADVANTAGE OF THIS OPPORTUNITY
THE PROPOSED MODIFICATIONS

• CHANGE NAME FROM "RESEARCH ONLY" TO "DISSERTATOR MODE"

• ALLOW ALL STUDENTS IN "DISSERTATOR MODE" TO TAKE UP TO 3 CREDITS OF ADVANCED GRADUATE ELECTIVES EACH SEMESTER AT NO EXTRA COST IF THERE ARE SEATS AVAILABLE IN THE CLASS IF THEIR ADVISOR APPROVES

• INCREASE THE COST OF THE 9 "DISSERTATOR MODE CREDITS" SO THAT THE REVENUE GOING INTO THE GRAD TUITION POOL IS NO LESS THAN IT IS NOW WITH THE SMALL FRACTION OF THE "RESEARCH ONLY" MODE STUDENTS WHO TAKE EXTRA ELECTIVES AND PAY FOR THEM

HOW MUCH WOULD THIS MODIFICATION INCREASE THE COST OF "RESEARCH ONLY" MODE FROM ITS PRESENT VALUE?
## APPROACH TO ESTIMATING AN INCREASE IN THE COST OF "RESEARCH ONLY" MODE CREDITS TO MAKE PROPOSAL REVENUE NEUTRAL TO THE GRAD TUITION FUND POOL

<table>
<thead>
<tr>
<th>Present Cost/Grad Credit</th>
<th>$744</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Cost/Research Only Mode Credit</td>
<td>$248</td>
</tr>
</tbody>
</table>

### SPRING SEMESTER 2013

<table>
<thead>
<tr>
<th>SPRING SEM 2013 DATA FROM REGISTRAR'S OFFICE</th>
<th># Students Research Only mode</th>
<th>Additional Credits</th>
<th># of BILLED additional Credits taken</th>
<th>% Students taking SOME additional credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>PHD</td>
<td>136</td>
<td>4</td>
<td>10</td>
<td>3%</td>
</tr>
<tr>
<td>SUM PHD + MS</td>
<td>155</td>
<td>4</td>
<td>10</td>
<td>3%</td>
</tr>
</tbody>
</table>

155 students w/ 9 res only mode credits

$ needed for Res only mode credits to offset BILLED additional credits that would potentially be lost to this fund pool $353,400

**NEW COST PER CREDIT FOR RESEARCH ONLY MODE TO MAKE OFFERING CHANCE TO TAKE 3 CREDIT ELECTIVE REVENUE NEUTRAL TO GRAD SCHOOL TUITION POOL**

$253

**NEW % cost of regular grad credit** 34%

<table>
<thead>
<tr>
<th>BOTTOM LINE: BY INCREASING $/SEMESTER OF RESEARCH ONLY MODE TO THIS AMT:</th>
<th>$2,280</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM THIS AMT:</td>
<td>$2,232</td>
</tr>
<tr>
<td>(an increase in $/semester of approximately):</td>
<td>$48</td>
</tr>
</tbody>
</table>

**WE CAN OFFER GRAD STUDENTS IN RESEARCH ONLY MODE THE OPPORTUNITY TO TAKE UP TO 3 GRAD CREDITS/SEMESTER IN ADVANCED ELECTIVES (SUBJECT TO AVAILABILITY OF SEATS) WITHOUT THE GRAD STUDENT TUITION POOL LOSING REVENUE**
February 5, 2013

NOTE: (all handouts connected to a single pdf file)

1. Review minutes of 01/15/12

2. Committee Reports:
   a. Graduate Tuition and Stipend Review Committee (Dean Huntoon)

3. Old Business
   a. Proposal for Determining When International Students Need ESL Services (Dean Huntoon)
   b. Proposal for Allowing Multiple Attempts at Oral Exams (Dean Huntoon)
   c. Proposal for a Professional Master of Geographic Information Science (A. Storer)

4. New Business
   a. Proposal to Modify (revenue-neutral modification) Research Only Mode (P. Moran)