

PROPOSAL SUMMARY AND ROUTING FORM

Proposal Title: Modification of the Geographic Information Systems (GIS) Certificate

Initiating Unit or Individual: Surveying Engineering Department

Contact Person's Name: Sayed R. Hashimi e-mail: hashimis@ferris.edu phone: 591-2632

Date or Semester of Proposal Implementation: Summer 2008

- Group I - A – New degree/major or major, or redirection of a current offering
- Group I - B – New minors or concentrations
- Group II - A – Minor curriculum clean-up and course changes
- Group II - B – New Course
- Group III - Certificates
- Group IV – Off-Campus Programs

Group/Individual	Signature	Date	Vote/Action *
Program Faculty			<input type="checkbox"/> Support <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support
Department Faculty	<i>S. Hashimi</i>	3/22/07	<input checked="" type="checkbox"/> Support 5/5 <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support
Department Head / Chair	<i>S. Hashimi</i>	3/22/07	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support
College Curriculum Committee	<i>S. McKean</i>	5/3/07	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support
Dean	<i>[Signature]</i>	5/17/07	<input type="checkbox"/> Support <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support
University Curriculum Committee	<i>[Signature]</i>	10/03/07	<input checked="" type="checkbox"/> Support 7-0 <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support
Senate	<i>Richard Sufferin</i>	10/3/07	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support
Academic Affairs	<i>[Signature]</i>	10/14/07	<input checked="" type="checkbox"/> Support <input type="checkbox"/> Support with Concerns <input type="checkbox"/> Not Support

* Support with Concerns or Not Support must include a list of concerns.

To be completed by Academic Affairs		
President (Date Approved)	Board of Trustees (Date Approved)	President's Council (Date Approved)

REC'D OCT 03 2007

1. Proposal Summary

Geographic Information Systems (GIS) is an evolving technology which has changed greatly in the last decade and is affecting many disciplines. This proposal comes as a response to these dramatic changes. It aims at expanding the GIS Certificate and making it a three-course certificate. The additional course is an existing GIS course which is taught as an in-class course (GISC 225), the two existing courses (SURE 282, and SURE 382) of the certificate will be modified (new names GISC 282, GISC 382) and will include new data collection techniques, advanced data analysis methods, and contemporary applications of GIS.

2. Summary of All Course Action Required*

a. Newly Created Courses to FSU:

Prefix	Number	Title
GISC	282	Geographic Information Systems 2
GISC	382	GIS Data Analysis and Specialization

b. Courses to be Deleted From FSU Catalog:

Prefix	Number	Title
SURE	282	Geographic Information Systems 1
SURE	382	Geographic Information Systems 2

c. Existing Course(s) to be Modified:

Prefix	Number	Title
---------------	---------------	--------------

d. Addition of existing FSU courses to program

Prefix	Number	Title
GISC	225	Principles of GIS

e. Removal of existing FSU courses from program

Prefix	Number	Title
---------------	---------------	--------------

NEW COURSE INFORMATION FORM

See Sample: Limit to One Page.

Course Identification:

Prefix:	Number	Title
GISC	282	Geographic Information Systems 2

Course Description:

Continuation of GISC 225. This course covers spatial data collection techniques and land information systems. Spatial data collection techniques such as land surveying, Global Positioning System, photogrammetric mapping, remote sensing, Lidar, and mobile mapping will be studied. Geodetic and Cartographic data from Federal Government will be explored as well as mapping procedures and accuracy standards. Principles of the cadastre system will be taught including the public land survey system, property descriptions, and boundary surveys.

Course Outcomes:

Upon completing this course, students will be able to:

1. Demonstrate a command of the principles of spatial data collection and mapping. Assessment: Given various datasets, students will compile the existing data, collect new data and create a map.
2. Design and implement a data collection project for a specific Geographical Information System application. Assessment: Presented with a problem, students will be able to identify the best data collection technique and explain the procedures they should employ to carry out the task.
3. Understand the use of GIS in cadastral applications. Assessment: students will be able to describe different methods for property description and boundary survey, and explain the role of GIS in the Cadastre.

Course Outline including Time Allocation:

Spatial data collection methods

- (6) Land Surveying: distance measurements, angle measurements, computing coordinates using distances and angles, and the topographic mapping process
- (4) The Global Position System: System components, GPS surveying methods, and data acquisition, and GPS Errors.
- (6) Photogrammetry: Difference between maps and photographs, flying height and scale of photographs, distortions in photography, stereoscopic viewing, stereoscopic plotters (analog and digital), and softcopy photogrammetry
- (2) Orthophotography: Advantages and disadvantages of digital orthophotographs, standards and applications
- (4) Concepts of Remote Sensing: Principles of the electromagnetic spectrum, spatial and spectral resolution, satellite systems.
- (2) LIDAR principles and applications: Principles of Laser scanning technology, advantages and disadvantages of Lidar, Lidar Products
- (2) Mobile Mapping Systems: Basic sensors and technology, direct sensor orientation, benefits of mobile mapping systems
- (1) Attribute data collection using surveys and census information
- (2) Using existing maps as data sources (map digitizing)
- (3) Data from Geodetic and Cartographic data from Federal Government such as: National Oceanic and Atmospheric Administration, National Geospatial-Intelligence Agency, U. S. Army Corps of Engineers, Department of Agriculture, Department of Transportation, Bureau of the Census, U. S. Geological Survey, and state and local agencies, commercial organizations.
- (4) Mapping Specifications and accuracy standards

GIS and Cadastre:

- (4) The Public Land Survey System, Subdivision of land into townships, sections,
- (4) Property descriptions (metes and bounds, block and lot system, PLSS), Registration of title, Boundary Surveys, introduction
- (1) Parcel based land information system

NEW COURSE INFORMATION FORM

See Sample: Limit to One Page.

Course Identification:

Prefix:	Number	Title
GISC	382	GIS data analysis and specialization

Course Description:

Continuation of GISC 282. Key topics include the point process and network analysis, and advanced surface operations (interpolation, line of sight, volume calculation, drainage, contour line mapping, and 3D visualization). Students will perform an independent research on one GIS specialty application (e.g., homeland security and criminal justice, transportation, health care, natural resources, environment and nature protection, city and county management, utilities, and public administration).

Course Outcomes:

Upon completing this course, students will be able to:

1. Demonstrate a command of the principles of spatial data analysis. Assessment: Given various datasets, students will be able to identify patterns using GIS techniques.
2. Interpolated spatial data using Geographical Information System. Assessment: presented with a dataset, students will be able to predict the value of an unsampled attribute using measurements made in the vicinity of the point.
3. Specialize in a particular GIS application. Assessment: students will conduct research on the specialization topic and write a report on the applications of GIS in this specialization topic.

Course Outline including Time Allocation:

Surfaces and raster data analysis including

- (3) Spatial data structures (Delaunay triangulation properties and algorithm, Voronoi diagram properties and algorithm).
- (4) Spatial data interpolation (Local and global interpolation strategies, statistical approach, inverse distance interpolation, and linear interpolation (TIN))
- (4) Digital surfaces visualization techniques (Contour line maps, 3D Scenes)
- (4) Image processing (filtering, contrast enhancement).
- (4) Decision support GIS.
- (3) Spatial point pattern analysis (central tendency, nearest neighbor analysis, quadrant analysis).
- (3) Network analysis (minimum spanning tree and shortest path algorithm).

(20) Independent study of the application of GIS in specific field of study. This study will be described in a final report which introduces the application, reviews previous work of using GIS in this field, and describes a specific case study including methodology, experiments, and conclusions.

CREATE A NEW COURSE

Course Date Entry Form

FORM F
Create Course
rev. 2/14/05

I. ACTION TO BE TAKEN: CREATE A NEW COURSE

Notes

1. Complete each item in section I and section II.
2. : If this course is to be used as a prerequisite for other university courses, Form Fs that reflect the prerequisite change must be submitted for those courses as well.

Term Effective: a. Semester Summer b. Year 2008 See instructions.

II. PROPOSED FOR NEW COURSE: Complete all sections of this part through Prerequisites. See instructions in manual for further clarification.

- a. Course Prefix GISC b. Number 382 c. Enter Contact Hours or check Independent Study (X).
LECTure 3 hr/week LAB hr/week INDEpendent Study
Practicum: hr/semester Seminar: hr/week
- d. Full Course Title: GIS data analysis and specialization
e. Abbreviated Course Title: GIS data analysis and spec. (Abbreviate only if necessary. Use Arabic numerals. Limit to 26 characters and spaces.)
f. Semester(s) Offered: Summer (See instructions for listing.) g. Max. Section Enrollment : 20 ✓

Credit Hours: Check (x) type and enter maximum and minimum hours in boxes.

- h. Type: Variable Fixed i. Maximum Credit Hours 3 j. Minimum Credit Hours
- k. Grade Method: Check (x) Normal Grading Credit/No Credit only (Pass/Fail)
- m. May Be Repeated for Added Credit: Check (x) Yes No
- n. Levels: Check (x) Undergraduate Graduate Professional
- o. Does proposed new course replace an equivalent course? Check (x) Yes No
- p. Equivalent course: Prefix SURE Number 382 See instructions on Replacement courses.

q. CATALOG DESCRIPTION – Limit to 75 words – PLEASE BE CONCISE.


Continuation of GISC 282. Key topics include the point process and network analysis, and advanced surface operations (interpolation, line of sight, volume calculation, drainage, contour line mapping, and 3D visualization). Students will perform an independent research on one GIS specialty application (e.g., homeland security and criminal justice, transportation, health care, natural resources, environment and nature protection, city and county management, utilities, and public administration).

r. Prerequisites: (if no prerequisites, write "None") Limited to 60 spaces. GISC282.

UCC Chair Signature/Date:

 10/31/07

Academic Affairs Approval Signature/Date:

 10/10/07

To be completed by Academic Affairs Office: - Standard & Measures Coding and General Education Code

Basic Skill (BS) General Education (GE) Occupational Education (OC) G.E. Codes

Office of the Registrar use ONLY

Date Received: _____ Date Completed: _____ Entered: SIS [125 ___ 1D4 ___ 12R ___, 131 ___]

DELETE COURSE

Course Date Entry Form

FORM F
Delete Course
rev. 2/14/05

I. ACTION TO BE TAKEN: DELETE COURSE FROM CATALOG.

Note: Complete each section.

The course described below will be moved to inactive status.

a. Term Effective: Semester Summer Year 2008 See instructions.

II. CURRENT COURSE TO BE DELETED FROM THE ACTIVE STATUS:

Include the information that is in the current course database.

a. Course Prefix SURE b. Number 282 c. Enter Contact Hours or check Independent Study (X).
LECTure 3 hr/week LAB hr/week INDEpendent Study
Practicum: hr/semester Seminar: hr/week

d. Full Course Title: Geographic Information Systems 1

UCC Chair Signature/Date:

 10/3/07

Academic Affairs Approval Signature/Date:

 10/10/07

Office of the Registrar use ONLY

Date Received: _____ Date Completed: _____ Entered: SIS [125 __, 1D4 __ 12R__ 131__]

DELETE COURSE

Course Date Entry Form

FORM F
Delete Course
rev. 2/14/05

I. ACTION TO BE TAKEN: DELETE COURSE FROM CATALOG.

Note: Complete each section.

The course described below will be moved to inactive status.

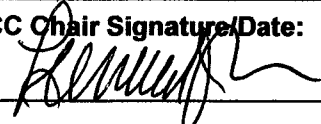
a. Term Effective: Semester Summer Year 2008 See instructions.

II. CURRENT COURSE TO BE DELETED FROM THE ACTIVE STATUS:

Include the information that is in the current course database.

a. Course Prefix SURE b. Number 382 c. Enter Contact Hours or check Independent Study (X).
LECTure hr/week LAB hr/week INDEpendent Study
Practicum: hr/semester Seminar: hr/week
d. Full Course Title: Geographic Information Systems 2

UCC Chair Signature/Date:

 10.3.07

Academic Affairs Approval Signature/Date:

 10.16.07

Office of the Registrar use ONLY

Date Received: _____ Date Completed: _____ Entered: SIS [125 __, 1D4 __ 12R__ 131__]



Leonard Johnson/FSU

09/13/2007 11:53 AM

To Sayed R Hashimi/FSU@FERRIS

Sandra L Alspach/FSU@FERRIS, Chuck

cc Drake/FSU@Ferris, Leonard Johnson/FSU@Ferris, Roy
McLean/FSU@FERRIS, Andrew L Purvis/FSU@FERRIS,

bcc

Subject GIS Proposal

Sayed

The UCC met yesterday to consider your proposal to expand the GIS certificate. However, before we can move the proposal forward, please attend to the following questions/concerns:

- 1) Please submit a Form C to your library liaison for the newly created courses,
- 2) Clarify which Form F for GISC 282 and GISC 382 you intend (there are two of each in the proposal, both different), and;
- 3) Fix the typos on your Form A ("advanced data analysis" and "data")....(you can email the corrected Form A and I'll switch the pages in question).

Please contact either Chuck Drake or me if you have any questions.

Thanks,

Leonard

Leonard R. Johnson, Ph.D
Professor
Ferris State University
1349 Cramer Circle
Big Rapids, Michigan 49307
(231) 591-2134
<http://www.ferris.edu/education/education>



Leonard Johnson/FSU
10/01/2007 09:50 AM

To Sandra L Alspach/FSU@FERRIS, Chuck
Drake/FSU@Ferris, Leonard Johnson/FSU@Ferris, Roy
McLean/FSU@FERRIS, Andrew L Purvis/FSU@FERRIS,
cc
bcc
Subject Fw: GIS Proposal

fyi

Leonard R. Johnson, Ph.D
Professor
Ferris State University
1349 Cramer Circle
Big Rapids, Michigan 49307
(231) 591-2134
<http://www.ferris.edu/education/education>

----- Forwarded by Leonard Johnson/FSU on 10/01/2007 09:49 AM -----



Donna J Schmidt/FSU
09/26/2007 04:50 PM

To Leonard Johnson/FSU@Ferris
cc Sayed R Hashimi/FSU@FERRIS
Subject Fw: GIS Proposal

Leonard,
Attached are the corrected Forms A and F (GISC 282 & GISC 382) for the Modification of the Geographic Information Systems (GIS) Certificate curriculum proposal. Sayed spoke with Chuck Drake regarding the need for the Form C. Sayed pointed out that these are not new courses, but are only new names for the courses. Chuck agreed that the Form C probably wasn't necessary.



FORMA_SURE_Sep1407.doc



FormF_CreateGISC382_Sep1407.doc FORMF_CreateGISC282_Sep1407.doc

~~~~~  
Donna Schmidt  
Secretary to the Associate Dean  
College of Technology  
Ferris State University  
1009 Campus Drive, J-H 200  
Big Rapids, MI 49307  
231-591-2893  
FAX 231-591-2946

----- Forwarded by Sayed R Hashimi/FSU on 09/17/2007 11:49 AM -----

