0. Form NP – New Program Proposal Form

NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s): Northwest Missouri State University

Program Title: BS in Geographic Information Science

Degree/Certificate: new emphasis for a Bachelor of Science program

Options: Precision Agriculture

Delivery Site(s): Maryville campus

CIP Classification: 450799 (Please provide a CIP code)

Implementation Date: Fall 2016

Cooperative Partners: n/a

Expected Date of First Graduation: Spring 2017

AUTHORIZATION

Timothy Mottet, Provost		November 30, 2015
Name/Title of Institutional Officer	Signature	Date

Gregory Haddock, Vice Provost	(660) 562-1145
Person to Contact for More Information	Telephone

2. Need (Form SE - Student Enrollment Projections)

Student Demand:

i. Estimated enrollment each year for the first five years for full-time and part-time students (Please complete Form SE.)

Year	*1*	*2*	*3*	*4*	*5*
Full-time	5	5	5	5	5
Part-time	____	____	____	____	____
Total	5	5	5	5	5

ii. Will enrollment be capped in the future?

Enrollment in the GIScience major across the various emphases is roughly 25 students. This new emphasis area in Precision Agriculture will strengthen the major with additional students without adding any new coursework or changing instructional teaching loads. There are no plans to cap the major, or any of the emphasis areas.

What method(s) or data were used to project student enrollment for this proposed program?

Since the establishment ofthe interdisciplinary minor in Precision Agriculture in 2006, there has been a stable enrollment in this minor, about 10 students per year. Most, if not all, students take this Precision Agriculture minor with a major such as Agronomy or Horticulture. Because the comprehensive major in GIS does not require a minor, it is difficult for GIS major students to obtain precision agriculture coursework and be recognized for it. We seek a new emphasis area in precision agriculture to facilitate GIS major students to obtain coursework in Precision Agriculture and pursue a career in agriculture.

A. Market Demand:

. National, state, regional, or local assessment of labor need for citizens with these skills

It is difficult to show an exact career path specifically in precision agriculture which is why it is currently offered as a minor (to add to an existing major), and now being proposed as an emphasis option to the existing GIScience major. Students with credentials in precision agriculture have been more competitive for jobs having that skill base in their background and specifically mentioned on their resume. Employers continue to tell our faculty the continued need to specialize in this area.

2. Need (Form SE - Student Enrollment Projections)

B. Societal Need:

i. General needs which are not directly related to employment

Programs in this area continue to grow Missouri as a leader in providing spatial analysis expertise, especially in the Kansas City region. Precision Agriculture aids the state in lowering cost of crop production and reducing excess application of crop treatment (particularly fertilizer use).

C. Methodology used to determine "B" and "C" above.

Experience in advising students and gradutes in the field of GIScience and precision agriculture over many years has kept our faculty in touch with the employment areas that require this expertise. As mentioned above, very few jobs will explicitely be titled with the term "precision agriculture" so specific job sectors are not available. However, it does increase the skillset of a student graduating in GIScience to have an expertise in precision agriculture for certain jobs in consulting, grower co-ops, etc.

3. Duplication and Collaboration: (Form CL – Collaborative Programs)

If similar programs currently exist in Missouri, what makes the proposed program necessary and/or distinct from the others at public institutions, area vocational technical schools, and private career schools?

There are a few programs in Geographic Information Science and GIS in the state at the 2-year level, the 4-year level, and graduate/undergraduate certificate. It is unique that an emphasis in the GIScience major at Northwest will focus on precision agriculture.

Does delivery of the program involve a collaborative effort with any external institution or organization?

No (If yes, please complete Form CL.)

3. Program Structure: (Form PS - Program Structure)

PROGRAM STRUCTURE

A. Total credits required for graduation: 124

B. Residency requirements, if any: n/a

C. General education: Total credits: 42

Courses (specific courses OR distribution area and credits):

6 credits in institutional requirements

D. Major requirements: Total credits: 54

Required Courses (32)

GEOG 32201 Maps & Map Interpretation 3

GEOG 32207 GPS Fundamentals 3

GEOG 32221 Economic Geography 3

GEOG 32362 Cartography 3

GEOG 32363 Remote Sensing 3

GEOG 32365 Geographic Information Systems 3

GEOG 32410 Geographic Thought & Research Methods 3

GEOG 32465 Introduction to Customized GIS 3

GEOG 32499 Senior Seminar Geography 1

GEOG 32565 Advanced Geographic Information Systems 3

CSIS 44141 Computer Programming I 3

CSIS 44346 Database Applications 3

Electives in GIS (6) (Choose six hours)

GEOG 32415 Internship in Geography 3

GEOG 32562 Digital Cartography and GeoVisualization 3

GEOG 32563 Digital Image Processing 3

Other advisor-approved electives 3

Electives in Regional Geography (3) {Choose three hours)

GEOG 32340 Geography of North America 3

GEOG 32341 Geography of Europe 3

GEOG 32342 Geography of Asia 3

GEOG 32343 Geography of the Middle East 3

3. Program Structure: (Form PS - Program Structure)

GEOG 32344 Geography of Africa 3

GEOG 32345 Geography of latin America 3

Precision Agriculture Emphasis

Required Courses (10)

AGRI 03232 Crop Production 3

AGRI 03234 Fundamentals of Soil Science 4

AGRI 03440 Introduction to Precision Agriculture 3

Electives (3) (Choose 3 hours)

AGRI 03434 Weed Science: Ecology and Control 3

AGRI 03445 Applied Research in Precision Agriculture 3

AGRI 03536 Soil Fertility 3

AGRI 03582 Plant Diseases 3

E. Free elective credits: 22 (Sum of C, D, and E should equal A.)

F. Requirements for thesis, internship or other capstone experience:

GEOG 32499 Senior Seminar Geography serves as the capstone course for this major.

G. Any unique features such as interdepartmental cooperation:

This is a program that will involve coursework from the School of Agricultre in addition to Computer Science and Geography courses from two other departments.

5. Program Characteristics and Performance Goals: (Form PG).

PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

Institution Name: Northwest Missouri State University

Program Name: BS in Geographic Information Science with an emphasis in Precision Agriculture

Date: January 26, 2016

(Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.)

Student Preparation

- Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.

  n/a

- Characteristics of a specific population to be served, if applicable.

  This major will be open to all undergraduate students seeking to specialize in this area.

Faculty Characteristics

- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.

  No specific requirement, but all GIS faculty have terminal degrees in the field.

- Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (and not FTE) in your descriptions here.

  100% full time faculty teaching coursework

- Expectations for professional activities, special student contact, teaching/learning innovation.

  None above regular duties per contract and obligation for professional development.

Enrollment Projections

- Student FTE majoring in program by the end of five years.

  Specifically in the precision agriculture emphasis we predict 5 students at five years.

- Percent of full time and part time enrollment by the end of five years.

5. Program Characteristics and Performance Goals: (Form PG).

Most of the students are full time so expectation is 100% full time students enrolled in the program.

Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.

  Only 1-2 per year at the three and five year (many more for the GIScience major in the other emphasis areas combined).

- Special skills specific to the program.

  hardware and software expertise in geographic information systems, GPS, precision agriculture technology (including GPS-enabled yield monitors and specialized mapping software)

- Proportion of students who will achieve licensing, certification, or registration.

  n/a

- Performance on national and/or local assessments, e.g., percent of students scoring above the 50th percentile on normed tests; percent of students achieving minimal cut-scores on criterion-referenced tests. Include expected results on assessments of general education and on exit assessments in a particular discipline as well as the name of any nationally recognized assessments used.

  Over 50% of the students will score above the national 50%-tile ont eh general education assessment exam.

- Placement rates in related fields, in other fields, unemployed.

  Placement rate expected to be 95% to 100% at six month after graduation. Most students majoring in GIScience work in the field directly upon graduation.

- Transfer rates, continuous study.

  n/a

6. Program Accreditation

- Institutional plans for accreditation, if applicable, including accrediting agency and timeline. If there are no plans to seek specialized accreditation, please provide reasons.

  none available

Alumni and Employer Survey

- Expected satisfaction rates for alumni, including timing and method of surveys

  The program will be on a regular rotation for five-year review, beginning in the 2016-2017 year. No data will be available at that time for the precision agriculture emphasis, but information learned from the rest of the program will still benefit. It will then be internally reviewed five years after that. Expectation of alumni satisfaction should be high.

- Expected satisfaction rates for employers, including timing and method of surveys

5. Program Characteristics and Performance Goals: (Form PG).

The five year periodicity for the self-study program review will include employer feedback and other employment data. Expected rate of satisfaction should be high.

7. Institutional Characteristics: Please describe succinctly why your institution is particularly well equipped or well suited to support the proposed program.

Northwest Missouri State has taught curriculum in the area of geographic systems for twenty-five years. There is an undergraduate and graduate program with three terminally degreed faculty dedicated to instruction in GIScience. The GIScience major has been successful in the past and adding an additional emphasis area strengthens the offering.

The School of Agriculture has been offering specialized courses in precision agriculture in recent years and student interest has been stronger. We have had a minor in Precision Agriculture for over ten years, but an emphasis to this existing major is a tighter coupling that will be more attractive to many students.

8. Any Other Relevant Information:

Appendix - Catalog copy of before/after change (new emphasis appears on last page, right column side)

Appendix – Catalog copy of before/after program change

Catalog comparison of Current and Proposed Curricula
Pages in catalog _2014 – 2016, page 134_____

Catalog (Current)			Catalog (Proposed)		
Geographic Information Science Comprehensive major, 53 Hours, B.S. --no minor required			**Geographic Information Science Comprehensive major, 53-54 Hours, B.S. --no minor required**		
CIP 450799			**CIP 450799**		
Requirements			**Requirements**		
Directed General Education Courses (10)			**General Education Courses (42)** *Must include the following* **(10):**		
GEOG 32101	Introduction to Geography	3	GEOG 32101	Introduction to Geography	3
GEOL 27114	General Earth Science	3	GEOL 27114	General Earth Science	3
	AND			AND	
GEOL 27115	General Earth Science Laboratory	1	GEOL 27115	General Earth Science Laboratory	1
	OR			OR	
GEOL 27110	General Geology	3	GEOL 27110	General Geology	3
	AND			AND	
GEOL 27111	General Geology Laboratory	1	GEOL 27111	General Geology Laboratory	1
MATH 17114	General Statistics	3	MATH 17114	General Statistics	3
Required Courses (32)			**Required Courses (32)**		
GEOG 32201	Maps & Map Interpretation	3	GEOG 32201	Maps & Map Interpretation	3
GEOG 32207	GPS Fundamentals	3	GEOG 32207	GPS Fundamentals	3
GEOG 32221	Economic Geography	3	GEOG 32221	Economic Geography	3
GEOG 32362	Cartography	3	GEOG 32362	Cartography	3
GEOG 32363	Remote Sensing	3	GEOG 32363	Remote Sensing	3
GEOG 32365	Geographic Information Systems	3	GEOG 32365	Geographic Information Systems	3
GEOG 32410	Geographic Thought & Research Methods	3	GEOG 32410	Geographic Thought & Research Methods	3
GEOG 32465	Introduction to Customized GIS	3	GEOG 32465	Introduction to Customized GIS	3
GEOG 32499	Senior Seminar Geography	1	GEOG 32499	Senior Seminar Geography	1
GEOG 32565	Advanced Geographic Information Systems	3	GEOG 32565	Advanced Geographic Information Systems	3

Appendix – Catalog copy of before/after program change

Date: 9/15/2015 **PROPOSAL** No. 115-32-01

CSIS 44140 Visual Basic Application Programming	3	CSIS 44141 Computer Programming I	3
CSIS 44346 Database Applications	1	CSIS 44346 Database Applications	1
Electives in GIS (6)		**Electives in GIS (6)**	
(Choose six hours)		(Choose six hours)	
GEOG 32302 Cadastral Mapping	2	GEOG 32415 Internship in Geography	1 to 3
GEOG 32415 Internship in Geography	1 to 6	GEOG 32562 Digital Cartography and GeoVisualization	3
GEOG 32562 Digital Cartography and GeoVisualization	3	GEOG 32563 Digital Image Processing	3
GEOG 32563 Digital Image Processing	3	Other advisor-approved electives	
Other advisor-approved electives			
Electives in Regional Geography (3)		**Electives in Regional Geography (3)**	
(Choose three hours)		(Choose three hours)	
GEOG 32340 Geography of North America	3	GEOG 32340 Geography of North America	3
GEOG 32341 Geography of Europe	3	GEOG 32341 Geography of Europe	3
GEOG 32342 Geography of Asia	3	GEOG 32342 Geography of Asia	3
GEOG 32343 Geography of the Middle East	3	GEOG 32343 Geography of the Middle East	3
GEOG 32344 Geography of Africa	3	GEOG 32344 Geography of Africa	3
GEOG 32345 Geography of Latin America	3	GEOG 32345 Geography of Latin America	3

Catalog comparison of Current and Proposed Curricula

Pages in catalog 2014 – 2016, page 134-135_____

Catalog (Current)		**Catalog (Proposed)**	
Data and Technology Emphasis		**Data and Technology Emphasis**	
Required Courses (9)		**Required Courses (6)**	
CSIS 44141 Computer Programming I	3	CSIS 44241 Computer Programming II	3
CSIS 44241 Computer Programming II	3	CSIS 44460 Database Systems	3
CSIS 44460 Database Systems	3		
Electives (3)		**Electives (6)**	
(Choose 3 hours)		(Choose 6 hours)	
CSIS 44540 Visual Application Development	3	CSIS 44144 Web Development I.	3
CSIS 44560 Advanced Topics in Database Systems	3	CSIS 44334 Web Development II	3
CSIS 44563 Developing Web Applications and Services	3	CSIS 44335 Script Programming	3
		CSIS 44356 Network Fundamentals	3
		CSIS 44542 Object-Orient Programming	3
		CSIS 44560 Adv Topics in Database Systems	3
		CSIS 44563 Developing Web App and Services	3
		CSIS 44599 Special Projects	1 to 6
		MATH 17599 Special Projects	1 to 6
Geographic Emphasis		**Geographic Emphasis**	
Required Course (3)		**Required Course (3)**	
GEOG 32522 Urban Geography	3	GEOG 32522 Urban Geography	3
Electives (9)		**Electives (9)**	
(Choose 9 hours)		(Choose 9 hours)	
GEOG 32360 Dynamic & Synoptic Meteorology	3	GEOG 32360 Dynamic & Synoptic Meteorology	3

Appendix – Catalog copy of before/after program change

Date: 9/15/2015 **PROPOSAL** No. 115-32-01

GEOG 32361 Climatology	3
GEOG 32501 Conservation of Natural Resources	3
GEOG 32520 Military Geography	3
GEOG 32521 Political Geography	3
GEOL 27510 Geomorphology	3

GEOG 32361 Climatology	3
GEOG 32370 Natural Disasters	3
GEOG 32501 Conservation of Natural Resources	3
GEOG 32520 Military Geography	3
GEOG 32521 Political Geography	3
GEOL 27510 Geomorphology	3

Earth Technology Emphasis	
Required Course (6)	
GEOL 27360 Environmental Geology	4
GEOL 27515 Environmental Regulations	2
Electives (6)	
(Choose 6 hours)	
GEOL 27235 Physical Oceanography	3
GEOL 27340 Introduction to Hydrogeology	3
GEOL 27510 Geomorphology	3
GEOG 32370 Nature Disasters	3
GEOG 32501 Conservation of Natural Resources	3
BIOL 04420 Environmental Issues	4
BIOL 04474 Wildlife Management & Conservation	2

Earth Technology Emphasis	
Required Course (6)	
GEOL 27360 Environmental Geology	4
GEOL 27515 Environmental Regulations	2
Electives (6)	
(Choose 6 hours)	
GEOL 27235 Physical Oceanography	3
GEOL 27340 Introduction to Hydrogeology	3
GEOL 27510 Geomorphology	3
GEOG 32370 Nature Disasters	3
GEOG 32501 Conservation of Natural Resources	3
BIOL 04420 Environmental Issues	4
BIOL 04474 Wildlife Management & Conservation	2

Civil/Public Emphasis	
Required Course (3)	
GEOG 32522 Urban Geography	3
Electives (9)	
(Choose 9 hours)	
POLS 34321 American Federalism	3
POLS 34332 Principles of Public Administration	3
POLS 34502 Public Policy	3
SOC 35316 Urban Sociology	3
ENGL 10315 Writing for the Professions	3

Civil/Public Emphasis	
Required Course (3)	
GEOG 32522 Urban Geography	3
Electives (9)	
(Choose 9 hours)	
GEOG 32521 Political Geography	3
POLS 34321 American Federalism	3
POLS 34332 Principles of Public Administration	3
POLS 34502 Public Policy	3
SOC 35316 Urban Sociology	3
ENGL 10315 Writing for the Professions	3

Emergency Management Response Emphasis	
Required Courses (6)	
SOSC 36301 Introduction to Disaster Response and Recovery	3
SOSC 36302 Principles of Humanitarian Relief	3
Electives (6)	
(Choose 6 hours)	
GEOG 32370 Natural Disasters	3
SOSC 36450 Homeland Security and Defense	3
PSYC 08345 Disaster Psychology	3
COM 29420 Crisis Communication	1 to 3

Emergency Management Response Emphasis	
Required Courses (6)	
SOSC 36301 Introduction to Disaster Response and Recovery	3
SOSC 36302 Principles of Humanitarian Relief	3
Electives (6)	
(Choose 6 hours)	
GEOG 32370 Natural Disasters	3
SOSC 36450 Homeland Security and Defense	3
PSYC 08345 Disaster Psychology	3
COM 29420 Crisis Communication	1 to 3

Appendix – Catalog copy of before/after program change

Date: 9/15/2015 **PROPOSAL** No. 115-32-01

Note: Students with the comprehensive B.S. in Geographic Information Science can fulfill the Geography minor with an additional regional class (3 hours) and 12 hours of advisor approved 300-level or above courses.	**Precision Agriculture Emphasis** **Required Courses (10)** AGRI 03232 Crop Production 3 AGRI 03234 Fundamentals of Soil Science 4 AGRI 03440 Introduction to Precision Agriculture 3 **Electives (3)** (Choose 3 hours) AGRI 03434 Weed Science: Ecology and Control 3 AGRI 03445 Applied Research in Precision Agriculture 3 AGRI 03536 Soil Fertility 3 AGRI 03582 Plant Diseases 3 Note: Students with the comprehensive B.S. in Geographic Information Science can fulfill the Geography minor with an additional regional class (3 hours) and 12 hours of advisor approved 300-level or above courses.