ADDENDUM TO AGENDA
UNIVERSITY COMMITTEE ON COURSES AND CURRICULA
October 16, 2015

1. Welcome
2. Approval of Minutes
3. Course proposals by college/school

AGRICULTURE AND LIFE SCIENCES

Modification	ADS 4111/6111	Swine Production and Management Laboratory
Modification	ADS 4113/6113	Swine Science

FOREST RESOURCES

Deletion	FO 4451/6451	Remote Sensing Lab
Modification	FO 4452/6452	Remote Sensing Applications

4. Degree proposals by college/school

FOREST RESOURCES

Modification	BS	Forestry/Environmental Conservation; Urban Forestry

APPROVAL FORM FOR

COURSES

MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the course change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted, along with all required copies, to UCCC, Garner Hall, Room 279, Mail Stop 9702.

College or School: Forest Resources **Department:** Forestry

Contact Person: Stephen C. Grado **Mail Stop:** 9681 **E-mail:** sgrado@cfr.msstate.edu

Nature of Change: Modify **Date Initiated:** 4-2-14 **Effective Date:** 7-1-2014

Current Listing in Catalog:

Symbol	Number	Title	Credit Hours
FO	4452/6452	Remote Sensing Applications	(2)

Current Catalog Description:

(Prerequisite: A basic image interpretation or remote sensing course or consent of instructor; Co-requisite: FO 4451/6451;). Two hours lecture. An introduction to remote sensing with emphasis on analysis and applications of digital image data in inventory, monitoring, and management of renewable natural resources.

New or Modified Listing for Catalog:

Symbol	Number	Title	Credit Hours
FO	4453/6453	Remote Sensing Applications	(3)

New or Modified Catalog Description:

(Prerequisite: A basic image interpretation or remote sensing course or consent of instructor). Two hours lecture. One hour lab. An introduction to remote sensing with emphasis on analysis and applications of digital image data in inventory, monitoring, and management of renewable natural resources.

	Date:
Approved: Andrew Gall **Department Head**	
Jan R. Hall **Chair, College or School Curriculum Committee**	21 April 2014
Jan P. Munn for **Dean of College or School**	4/21/14
Chair, University Committee on Courses and Curricula	
Chair, Graduate Council (if applicable)	
Chair, Deans Council	

Proposed Course Modification for FO 4452/6452 – Remote Sensing Applications

1. Catalog Description

Current Description

FO 4452/6452. Remote Sensing Appl. (2) (Corequisite: FO 4451/6451; Prerequisite: A basic image interpretation or remote sensing course or consent of instructor). Two hours lecture. An introduction to remote sensing with emphasis on analysis and applications of digital image data in inventory, monitoring, and management of renewable natural resources.

Proposed Description

FO 4453/6453. Remote Sensing Appl. (3) (Prerequisite: A basic image interpretation or remote sensing course or consent of instructor). Two hours lecture. Three hours laboratory. An introduction to remote sensing with emphasis on analysis and applications of digital image data in inventory, monitoring, and management of renewable natural resources.

2. Itemized List and Description of Changes

A. Removed the corequisite of FO 4451/6451 (Remote Sensing Lab), as this laboratory will no longer be taught as a separate course.
B. Changed course number (to FO 4453/6453) and the description to reflect that a 3-hour laboratory will now be included as part of this course.
C. Description reflects both the lecture and field laboratory components of the course.

3. Justification

The main change is the addition of the 3-hour laboratory to the course. This is proposed because the laboratory course (FO 4451/6451) is no longer going to be taught as a separate course. The laboratory course (FO 4451/6451) was closely integrated with the present course (FO 4452/6452). Combining the lab with the lecture will completely link the two and also avoid conflicts generated by having to create registration overloads in either lab or lecture when students fail to register for both simultaneously. Students will now register for the lab at the same time as lecture.

4. Additional Information

A. Course Symbol – No change
B. Course Number – Change to 4453/6453
C. Course Title – No change
D. Credit Hours – Change to 3 with addition of lab
E. Pre-requisite/Co-requisite – Modified to reflect that a separate laboratory course is no longer a corequisite. All elements of the laboratory are to be incorporated into the 3-hour course.
F. Method/Hours of instruction – Modified to reflect that course delivery will now include 3 hours of laboratory in addition to the 2 hours of lecture.

G. Method of Delivery – Face-to-Face
H. Course Description – Includes prior lecture and lab course descriptions.
I. Course Content – The course will now include the material previously covered in the separate laboratory course.

5. Graduate Student Requirements

This is a split level course (formerly FO 4452/6452 and FO 4451/6451) and therefore, as before, the new course, FO 4453/6453, has an extra report requirement for graduate students.

6. Method of Evaluation

Students are evaluated based upon their performance on lecture quizzes, three hourly exams, and lab quizzes/assignments. Lecture quizzes cover reading assignments and material presented in the previous lecture. Hour exams cover all materials presented to date in the course (comprehensive). Grading in lab consists of lab quizzes/assignments based on the prior and/or current week's material. Weighting of points for the final grade will be:

Lecture quizzes	10%
Hour examinations (3)	60%
Weekly lab quizzes/assignments	30%

7. Support

The Department of Forestry Undergraduate Committee has discussed the above proposal. The committee voted to approve the proposed modifications.

Approved:
Date:

Stephen C. Grado
Chair, Undergraduate Committee

Remote Sensing Applications, FO 4452/6452 & 4451/6451
Lecture: **11:00-11:50 MW**
Lab: **12:30-3:20 T**

Instructor: David L. Evans
Office Hours: Rm 353 Thompson Hall. 10-11:00, Mon. - Fri. or by appointment.

Prerequisites: A basic photo interpretation or mapping/GIS course or consent of Instructor.

YOU MUST CHECK WITH INSTRUCTOR IF YOU HAVE A VISUAL IMPAREMENT. FAILURE TO MEET THE PREREQUISITES OR OBTAIN INSTRUCTOR CONSENT COULD RESULT IN YOUR BEING DROPPED FROM THE COURSE.

Course Description:
Remote sensing is obtaining information about something without physical contact. The most commonly used remote sensing tool is the camera. Aerial photography with film or digital cameras is an integral part of natural resource mapping and monitoring. Use of aerial photography is covered in greater detail in Spatial Technologies in Natural Resource Management (FO 4313/6313).

Non-photographic systems being used for natural resource management include: radar, LiDAR, video, digital cameras, and various multi-spectral and hyper-spectral sensors. This course provides a brief review of aerial photography concepts then addresses how data from non-photographic systems are collected and analyzed by digital image processing. Data from these systems and aerial photography provide key inputs to Geographic Information Systems (GIS). GIS is covered in detail in the course GIS for Natural Resource Management (FO-4472/6472 - 4471/6471).

This course places primary emphasis on digital image interpretation and analysis. It is imperative that each student has good working knowledge of computers with windowing operating environments. Software functions and image analysis techniques will be taught but fundamental computer concepts are assumed understood by all students in the class. You should not continue in this course if you are uncomfortable in using computer systems. Examples of concepts you should know are: moving around in directory structures (folders), creating and deleting directories (folders), copying, moving and deleting files, opening and closing windows, moving windows, starting and stopping applications.

Course Objectives:
1. Review the properties of electromagnetic radiation as they relate to remote sensing;
2. Review basic principles of aerial photography including: camera systems, films, digital imaging, photography acquisition, simple image interpretation, photogrammetry;
3. Learn the characteristics and appropriate applications of different passive and active sensors used for image data collection;
4. Learn methods of visual interpretation of imagery from digital sensors;
5. Learn the principles of basic digital image processing for information extraction;
6. Provide hands-on experience in digital image analysis through laboratory exercises;
7. Learn relationships between remote sensing and GIS in context of resource assessments.

Lecture Topics:

1. Introduction to Remote Sensing
2. Remote Sensing and Electromagnetic Radiation,
3. Camera Systems,
4. Aerial Photo / Image Interpretation, Photogrammetry,
5. Non-photographic Passive Systems,
6. Satellite Systems,
7. Active Sensors
8. Digital Image Processing,
9. Image Enhancement,
10. Image Rectification,
11. Image Classification,
12. Field Data,
13. Accuracy Assessment,
14. Imagery/Interpretation Uses in GIS,
15. Applications of Image Analysis.

Lab Topics:

1. Review of Target Recognition Concepts / Photogrammetry
2. Non-photographic Imagery
3. Introduction to Digital Image Analysis
4. Image Exploration
5. Image Correction / Rectification
6. Unsupervised Classification
7. Supervised Classification
8. Verification/Accuracy Assessments
9. Outputs / Models
10. LiDAR Data Processing

Text: Campbell, James B. and Randolph H. Wynne 2011. **Introduction to Remote Sensing, Fifth Ed.** The Guilford Press, New York, NY. 667 p. ISBN 978-1-60918-176-5

Lecture and lab materials are posted on MyCourses (access from myState on msstate.edu). The lecture material is basically in outline form and must be supplemented by taking additional notes and also reading designated chapters and other materials as indicated in the lecture topics outline below.

Grading:

Exam 1	15%	Exam 2	20%	
Final Exam	25%	Lecture quizzes	10%	(no make-up quizzes).
Lab assignments	30%			

The information presented is built upon and used throughout the course. Therefore, **material on successive exams is cumulative. Missed exams may not be taken at a later date.** With prior approval for documented excused absence, an exam may be taken early. Otherwise, the next exam counts for both the missed and next exam. Lecture quizzes are based on the previous lecture's material and/or assigned reading for the day.

Student Responsibilities:
Students will comply with all responsibilities outlined in the College of Forest Resources Handbook, Professional Expectations Document and the MSU Bulletin. Students are reminded to adhere to the code of conduct of MSU and that misconduct will be dealt with in accordance with guidelines and procedures given by the Student Honor Code Office accessible at: **http://www.honorcode.msstate.edu/.**

THE HONOR CODE (AOP 12.07): "AS A MISSISSIPPI STATE UNIVERSITY STUDENT I WILL CONDUCT MYSELF WITH HONOR AND INTEGRITY AT ALL TIMES. I WILL NOT LIE, CHEAT, OR STEAL, NOR WILL I ACCEPT THE ACTIONS OF THOSE WHO DO."

I expect each student to make every effort to fully participate in all aspects of the class and lab. Attendance is considered mandatory. If you know in advance that you will have to miss a class, you must notify the instructor. Please arrive in the class or lab prepared for the day's topic by reading the assigned material and by reviewing your notes. Assistance outside of regular class hours may be obtained either in regular office hours or by appointment.

Graduate students who elect to take this course for graduate credit will be required to develop a short additional written review of literature on use of a remote sensing technology in their respective fields of interest. A topic for this report is due prior to the spring break.

Lecture Topics	Reading	Class #
1) Introduction to Remote Sensing Course requirements Grading, tests, assignments	Syllabus	1
2) RS and EMR Background on RS Characteristics of EMR Energy Interactions Reflectance properties of surfaces Remote sensing system characteristics	Ch. 1&2	1 - 2
3) Camera Systems Passive versus active systems Aerial cameras and films Video cameras Digital cameras	Ch. 3	3
4) Airphoto / Image Interpretation Elements of photointerpretation Equipment Basic image geometry / scale Stereoscopy Height and planimetric measurements	Ch. 3.9 & 5	4-5
5) Non-photographic Passive Systems Multispectral scanners Thermal infrared systems Hyperspectral systems (Ch 15)	Ch. 4,9,10,15	6

Resolution and distortions		
6) Satellite systems	Ch. 6&21	7
Exam 1 (Tentative Date: Feb. 9)		**8**
7) Active Sensors	Ch. 7&8	9
Radar		
LiDAR		
8) Digital Image Processing (Background)	Ch. 4, 11	10 - 12
Data processing steps		
Statistical considerations		
Digital data characteristics		
Data display		
Image processing equipment		
9) Image Enhancement	Ch. 4.7 & 11	13
Density slicing		
Linear and non-linear enhancement		
Ratios		
Transformations		
10) Image Rectification	Ch. 11	14
Sources of errors		
Ground control selection		
Resampling		
Mosaics		
11) Image Classification	Ch. 12	15-16
Classifiers		
Clustering		
Strategies		
Graduate Student Report Topics Due: March 5		
Exam 2 (Tentative Date: March 18)		**17**
12) Field Data	Ch 13	18
Collection		
Use in interpretation / classification		
Sampling		
13) Accuracy assessment	Ch 14	19
14) Imagery / Interpretation uses in GIS		20-21
GIS overview		
Imagery use in GIS		
Project management		
15) Applications of Image Analysis	Ch. 17&20	22-24
Selected Readings		
16) Guest Lectures, Last exam review		25-28

Graduate Student Reports Due April 22
Final Exam Thurs May 7, 12-3:00

Lab Information

First lab meeting Feb 3.
All labs meet in Rm A308 Thompson Hall Annex

Make sure to go to MyCourses (access from myState on msstate.edu) and print the lab assignment prior to each lab.

Computer Lab Rules:

- DO NOT TURN OFF THE COMPUTERS
- NO eating, drinking, smoking, chewing, dipping, etc.
- DO NOT abuse equipment (i.e. pounding on keyboards, yanking paper out of printers, etc.). Violators will be dealt with harshly.
- DO NOT use web browsers or other resources inappropriately.
- DO NOT remove documentation.
- Log out of the system when you have completed your work

Lab Topic	Lab
Review of Target Recognition Concepts Aerial photography (types, scale, season) Stereoscopy Basic aerial photointerpretation Photo/Map orientation, scale, measurements	1
Non-photographic Imagery Digital frame camera (Starr Forest) Satellite imagery (Landsat, SPOT, AVHRR) Radar (MS high-alt. radar mission) Visual Interpretation of Satellite Imagery Land-use vegetation cover interpretations	2
Introduction to Digital Image Analysis Computer lab use Introduction to software tools Data concepts Display and simple enhancement LUT Editing Convolution filters AOIs/Annotation	3
Image Correction / Rectification Image errors Ground control Resampling Mosaics	4

Remote Sensing Applications, FO 4453/6453
Lecture: **11:00-11:50 MW**
Lab: **12:30-3:20 T**

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Introduction to Digital Image Analysis Computer lab use Introduction to software tools Data concepts Display and simple enhancement LUT Editing Convolution filters AOIs/Annotation	3
Image Correction / Rectification Image errors Ground control Resampling Mosaics	4

Proposed Course Modification for FO 4451 – Remote Sensing Lab

1. Catalog Description

Current Description

FO 4451. Remote Sensing Lab (2) (Corequisite: FO 4452/6452; Prerequisite: A basic image interpretation or remote sensing course or consent of instructor). Three hours laboratory. Practical approaches to interpretation of remote sensing data. Emphasis is on computer applications for image analysis.

Proposed Description

None – course to be deleted

2. Itemized List and Description of Changes

A. Delete course. It is being combined with FO 4452 to make FO 4453.

3. Justification

This is proposed because the laboratory course (FO 4451) is no longer going to be taught as a separate course. The laboratory course (FO 4451) was closely integrated with the present course (FO 4452). Combining the lab (FO 4451) with the lecture (FO 4452) as FO 4453 will completely link the two and also avoid conflicts generated by having to create registration overloads in either lab or lecture when students fail to register for both simultaneously. Students will now register for the lab at the same time as lecture.

4. Additional Information

5. Graduate Student Requirements

6. Method of Evaluation

7. Support

The Department of Forestry Undergraduate Committee has discussed the above proposal. The committee voted to approve the proposed modifications.

Approved:
Date: Stephen C. Grado 4/7/14

Stephen C. Grado
Chair, Undergraduate Committee

Proposed Course Modification for FO 6451 – Remote Sensing Lab

1. Catalog Description

Current Description

FO 6451. Remote Sensing Lab (2) (Corequisite: FO 4452/6452; Prerequisite: A basic image interpretation or remote sensing course or consent of instructor). Three hours laboratory. Practical approaches to interpretation of remote sensing data. Emphasis is on computer applications for image analysis.

Proposed Description

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4. Additional Information

5. Graduate Student Requirements

6. Method of Evaluation

7. Support

The Department of Forestry Undergraduate Committee has discussed the above proposal. The committee voted to approve the proposed modifications.

Approved:
Date:

Stephen C. Grado 4/7/14

Stephen C. Grado
Chair, Undergraduate Committee

APPROVAL FORM FOR

DEGREE PROGRAMS

MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted, along with all required copies, to UCCC, Mail Stop 9699 (244 Magruder Street, 2nd Floor), Phone: 325-0831.

College: Forest Resources **Department:** Forestry

Contact Person: Stephen C. Grado **Mail Stop:** 9681 **E-mail:** sgrado@cfr.msstate.edu

Nature of Change: Modification **Date:** 4/7/14

Program will be offered at: Starkville (Campus 1)

Current Degree Program Name: Bachelor of Science **Effective Date:** 7/1/2014

Major: Forestry **Concentration:** Environmental Conservation; Urban Forestry

New Degree Program Name: Bachelor of Science

Major: Forestry **Concentration:** Environmental Conservation; Urban Forestry

Summary of Proposed Changes:

The changes can be summarized as a request to modify the GIS Nat Res Management (FO 4472/6472) courses and delete the GIS Nat Res Management Lab (FO 4471/6471) courses into GIS Nat Res Management (FO 4473/6473). Previously this had been approved by the UCCC for the Remote Sensing Applications lecture and laboratories for changing FO 4452 into FO 4453 and FO 6452 into FO 6453, and then deleting 4451 and 6451. This programmatic change incorporates both of the above modifications.

Department Head	
Chair, College or School Curriculum Committee	21 April 2014
Dean of College or School	4/21/14
Chair, University Committee on Courses and Curricula	
Chair, Graduate Council (if applicable)	
Chair, Deans Council	

☐ SACS Letter Sent

1. CATALOG DESCRIPTION
   See below.

2. CURRICULUM OUTLINE

CURRENT DEGREE DESCRIPTION	NEW DEGREE DESCRIPTION
Degree: Bachelor of Science Forestry **Concentrations:** Environmental Conservation, Forest Management, Forest Products, Wildlife Management, Urban Forestry	**Degree:** Bachelor of Science Forestry **Concentrations:** Environmental Conservation, Forest Management, Forest Products, Wildlife Management, Urban Forestry
Degree Description: The objective of the Forestry Major is to prepare its graduates for professional, science-based careers in the management and use of forested ecosystems. By combining courses offering a broad general education with specialized professional courses, the curriculum of the Forestry Major is designed to produce professionally competent graduates who have appropriate development in interpersonal relations, written and oral communications, cultural understanding, environmental awareness, and professional ethics. The educational programs in Forest Management, Wildlife Management, Urban Forestry, Environmental Conservation, and Forest Products lead to the first professional degree in Forestry at Mississippi State University and are accredited by the Society of American Foresters (SAF), the specialized accrediting body recognized by the Commission of Recognition of Post-secondary Accreditation and the U.S. Department of Education as the accrediting agency for forestry education in the United States. The Forest Products program is also accredited by the Society of Wood Science and Technology (SWST). The core curriculum of the Forestry Major is comprised of specifically selected and intentionally designed courses which must be completed satisfactorily by each student who intends to graduate in this major. In addition to completing the core curriculum of the Forestry Major, each student must complete one of five academic concentrations for specialized study offered by the Forestry Major. Graduates of the major are qualified to become a Registered Forester in Mississippi after completing an examination for this purpose from the Board of Registration for Foresters in Mississippi. The Forestry Major is designed for completion in four academic years which includes a nine-week Summer Field Program between the sophomore and junior years. Completion of the Summer Field Program is prerequisite to enrollment in junior/senior level professional courses in the Forestry	**New Degree Description:** No changes.

Major and students should plan their schedules accordingly. Correspondence courses are not accepted toward the forestry degree.	
Concentration Description: The five academic concentrations are Forest Management, Wildlife Management, Urban Forestry, Environmental Conservation, and Forest Products. Each concentration is an integral part of the Forestry Major and accredited by the SAF. The Forest Products concentration is also accredited by SWST. Two concentrations are an issue in this proposed change: **Urban Forestry Concentration:** This concentration addresses an emerging need for the management of trees in towns and cities. Urban foresters manage trees along city streets, in municipal parks, private wood lots, and utility right-of-ways. Employers include federal, state, and municipal governments, private consultants, and industry. **Environmental Conservation:** Students interested in careers dealing with complex environmental issues in the realm of forest resource management may prepare themselves through this concentration.	**New Concentration Description:** No changes.

Current Curriculum Outline	Required Hours	New Curriculum Outline	Required Hours
English (General Education): EN 1103 English Composition I OR EN 1163 Accelerated Composition I EN 1113 English Composition II OR EN 1173 Accelerated Composition II	6	**English (General Education):** EN 1103 English Composition I OR EN 1163 Accelerated Composition I EN 1113 English Composition II OR EN 1173 Accelerated Composition II	6
Fine Arts (General Education): Any General Education course (3 credits)	3	**Fine Arts (General Education):** Any General Education course (3 credits)	3
Natural Sciences BIO 1134 Biology I CH 1043 Survey of Chemistry I	7	**Natural Sciences** BIO 1134 Biology I CH 1043 Survey of Chemistry I	7
Math (General Education): See Concentration (3 credits) ST 2113 Introduction to Statistics OR BQA 2113 Business Statistical Methods I	6	**Math (General Education):** See Concentration (3 credits) ST 2113 Introduction to Statistics OR BQA 2113 Business Statistical Methods I	6
Humanities (General Education): Any General Education course (6 credits)	6	**Humanities (General Education):** Any General Education course (6 credits)	6
Social/Behavioral Sciences (General Education): AEC 2713 Introduction Food and Resource Economics OR EC 2113 Introduction to Macro	6	**Social/Behavioral Sciences (General Education):** AEC 2713 Introduction Food and Resource Economics OR EC 2113 Introduction to Macro Economics	6

Economics OR EC 2123 Introduction to Micro Economics FO 4113 Forest Economics		OR EC 2123 Introduction to Micro Economics FO 4113 Forest Economics	
Total General Education	**34**	**Total General Education**	**34**

Major Core Courses	**64**	**Major Core Courses**	**64**
BIO 1144 Biology II	4	BIO 1144 Biology II	4
EPP 3124 Forest Entomology	4	EPP 3124 Forest Entomology	4
FO 1011 Forest Resources Survey	1	FO 1011 Forest Resources Survey	1
FO 2113 Dendrology	3	FO 2113 Dendrology	3
FO 2213 Forest Measurements	3	FO 2213 Forest Measurements	3
FO 3012 Introduction to Forest Communities	2	FO 3012 Introduction to Forest Communities	2
FO 3015 Forest Description and Analysis	5	FO 3015 Forest Description and Analysis	5
FO 4123 Forest Ecology	3	FO 4123 Forest Ecology	3
FO 4213 Forest Biometrics	3	FO 4213 Forest Biometrics	3
FO 4221 Practice of Silviculture Laboratory	1	FO 4221 Practice of Silviculture Laboratory	1
FO 4223 Practice of Silviculture	3	FO 4223 Practice of Silviculture	3
FO 4231 Introduction to Wood Supply Systems	1	FO 4231 Introduction to Wood Supply Systems	1
FO Forest Operations and Harvesting	3	FO Forest Operations and Harvesting	3
FO 4313 Spatial Technologies in Natural Resource Management	3	FO 4313 Spatial Technologies in Natural Resource Management	3
FO 4413 Natural Resources Policy	3	FO 4413 Natural Resources Policy	3
FO 4323 Forest Resources Management	3	FO 4323 Forest Resources Management	3
FO 4423 Professional Practice	3	FO 4423 Professional Practice	3
PSS 3303 Soils	3	PSS 3303 Soils	3
WFA 3031 Intro to Wildlife and Fisheries Practices	1	WFA 3031 Intro to Wildlife and Fisheries Practices	1
WFA 4253 Prin of Wildlife Conservation and Management	3	WFA 4253 Prin of Wildlife Conservation and Management	3
Oral Communication Requirement CO 1003 Fundamentals of Public Speaking	3	**Oral Communication Requirement** CO 1003 Fundamentals of Public Speaking	3
Computer Literacy Requirement FO 3103 Computer Applications for Forest Resources and Laboratory	3	**Computer Literacy Requirement** FO 3103 Computer Applications for Forest Resources and Laboratory	3
Writing Requirement AIS 3203 Introduction to Technical Writing in Agricommunications OR MGT 3213 Organizational Communication OR BIO 3013 Professional Writing for Biologists	3	**Writing Requirement** AIS 3203 Introduction to Technical Writing in Agricommunications OR MGT 3213 Organizational Communication OR BIO 3013 Professional Writing for Biologists	3
Concentration Courses		**Concentration Courses**	
Environmental Conservation	**29**	**Environmental Conservation**	**29**

Concentration		**Concentration**	
MA 1313 College Algebra or equivalent	3	MA 1313 College Algebra or equivalent	3
PH 1113 General Physics OR	3	PH 1113 General Physics OR	3
Approved Substitutions		Approved Substitutions	
WF 3133 Appl Aquatic and Terrestrial Ecology	3	WF 3133 Appl Aquatic and Terrestrial Ecology	3
FO 3113 Forest Recreation Management	3	FO 3113 Forest Recreation Management	3
FO 4463 Forest Hydrology & Watershed Mgt	3	FO 4463 Forest Hydrology & Watershed Mgt	3
FO 4472 GIS Nat Res Management and	2	**FO 4473 GIS Nat Res Management**	3
FO 4471 GIS Nat Res Management Lab	1	**OR**	
OR		**FO 4453 Remote Sensing Applications**	3
FO 4452 Remote Sensing Applications and	2		
FO 4451 Remote Sensing Applications Lab	1		
14 credit hours Emphasis Electives - See Department Advisor for list of current approved Emphasis Electives	14	14 credit hours Emphasis Electives - See Department Advisor for list of current approved Emphasis Electives	14
Environmental Conservation Concentration Total Hours	**127**	**Environmental Conservation Concentration Total Hours**	**127**
Urban Forestry Concentration	**30**	**Urban Forestry Concentration**	**30**
MA 1313 College Algebra or equivalent	3	MA 1313 College Algebra or equivalent	3
FO 3113 Forest Recreation Management	3	FO 3113 Forest Recreation Management	3
FO 4353 Natural Resources Law	3	FO 4353 Natural Resources Law	3
FO 4472 GIS Nat Res Management and	2	**FO 4473 GIS Nat Res Management**	3
FO 4471 GIS Nat Res Management Lab	1	**OR**	
OR		**FO 4453 Remote Sensing Applications**	3
FO 4452 Remote Sensing Applications and	2	LA 3623 Urban Planning	3
		PS 1113 American Government	3
FO 4451 Remote Sensing Applications Lab	1	PSS 2423 Plant Materials I	3
		PSS 4353 Arbor and Landscape Maintenance	3
LA 3623 Urban Planning	3		
PS 1113 American Government	3	REM 3253 Real Property Evaluation	3
PSS 2423 Plant Materials I	3	REM 3333 Principles of Real Estate	3
PSS 4353 Arbor and Landscape Maintenance	3		
REM 3253 Real Property Evaluation	3		
REM 3333 Principles of Real Estate	3		
Urban Forestry Concentration Total Hours	**128**	**Urban Forestry Concentration Total Hours**	**128**

3. JUSTIFICATION AND STUDENT LEARNING OUTCOMES

The only change in the B.S. in Forestry degree occurs in the Environmental Conservation Concentration and the Urban Forestry Concentration where ***GIS Nat Res Management (FO 4472/6472) and GIS Nat Res Management Lab (FO 4471/6471) OR Remote Sensing Applications (FO 4452/6452) and Remote Sensing Applications Laboratory (FO 4451/6451)*** are required courses. These are being modified to add the 1-credit laboratory to each 2-credit hour lecture. This is proposed because ***GIS Nat Res Management Lab (FO 4471/6471) and Remote Sensing Applications Laboratory (FO 4451/6451)*** are no longer going to be taught as separate courses. The laboratory courses (i.e., FO 4471/6471, FO 4451/6451, respectively) were closely integrated with the ***GIS Nat Res Management and Remote Sensing Applications*** courses (i.e., FO 4472/6472,

FO 4452/6452, respectively). Combining the laboratory with the lecture will completely link the two and also avoid conflicts generated by having to create registration overloads in either laboratory or lecture when students fail to register for both simultaneously. Students will now register for the laboratory at the same time as lecture as one 3-credit hour course as opposed to the 2-credit hour lecture and 1-credit hour laboratory. Student effort and learning outcomes will not be affected by this change.