Chair: Tracy Christofero | **GC#7: Course Change**

Request for Graduate Course Change

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. ***The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.***

College: Liberal Arts Dept/Division: Geography Current Alpha Designator/Number: GEO531

Contact Person: James Leonard Phone: 6-4626

CURRENT COURSE DATA:

Course Title: Principles of Remote Sensing and Photogrammetry

Alpha Designator/Number: G E O 5 3 1

Title Abbreviation: R e m o t e S e n s i n g & P h o t o g r a

1. Complete this **five** page form in its entirety and route through the departments/committees below for changes to a course involving: course title, alpha designator, course number, course content, credit hours, or catalog description.
2. If this change will affect other departments that require this course, please send a memo to the affected department and include it with this packet, as well as the response received from the affected department.
3. If the changes made to this course will make the course similar in title or content to another department's courses, please send a memo to the affected department and include it with this packet as well as the response received from the affected department.
4. List courses, if any, that will be deleted because of this change (*must submit course deletion form)*.
5. If the faculty requirements and/or equipment need to be changed upon approval of this proposal, attach a written estimate of additional needs.

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head	Date 9/14/18
Registrar	Date 9/14/18
College Curriculum Chair	Date 9/19/18
Graduate Council Chair	Date

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College: Liberal Arts | Department/Division: Geography | Alpha Designator/Number: GEO531

Provide complete information regarding the course change for each topic listed below.

Change in CATALOG TITLE: ☐ YES ☒ NO

From _____ (limited to 30 characters and spaces)

To _____

If Yes, Rationale _____

Change in COURSE ALPHA DESIGNATOR:

From: _____ To _____ ☐ YES ☒ NO

If Yes, Rationale _____

Change in COURSE NUMBER: ☐ YES ☒ NO

From: _____ To: _____

If Yes, Rationale _____

Change in COURSE GRADING

From ☐ Grade To ☐ Credit/No Credit

Rationale _____

Change in CATALOG DESCRIPTION: ☐ YES ☒ NO IF YES, fill in below:

From _____

To _____

If Yes Rationale _____

Change in COURSE CREDIT HOURS: ☒ YES ☐ NO If YES, fill in below:

NOTE: If credit hours increase/decrease, please provide documentation that specifies the adjusted work requirements.

From: 3 credit hours

To: 4 credit hours

Change in COURSE CONTENT: ☐ YES ☒ NO

From:

To:

Rationale:

Request for Graduate Course Change-Page 4

College: Liberal Arts

Department: Geography

Course Number/Title GEO531 Remote Sensing & Photogrammetry

1. REQUIRED COURSE: If this course is required by another department(s), identify it/them by name and attach the written notification you sent to them announcing to them the proposed change and any response received. Enter NOT APPLICABLE if not applicable.

n/a

2. COURSE DELETION: List any courses that will be deleted because of this change. A *Course Deletion* form is also required. Enter NOT APPLICABLE if not applicable.

n/a

3. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials as a result of this change, attach an estimate of the time and cost etc. required to secure these items. (NOTE: approval of this form does not imply approval for additional resources. Enter NOT APPLICABLE if not applicable.

n/a

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Please insert in the text box below your course change summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings) based on the appropriate change:

COURSE DESCRIPTION CHANGE
Department:
Course Number and Title:
Rationale:
Course Description (old)
Course Description: (new)
Catalog Description:

COURSE NUMBER CHANGE
Department:
Current Course Number/Title:
New Course Number:
Rationale:
Catalog Description:
Credit hours:

COURSE TITLE CHANGE
Department:
Current Course Number/Title:
New Course Title:
Rationale:
Catalog Description:

COURSE CREDIT HOURS CHANGE
Department: Geography
Current Course Number/Title: GEO531 Remote Sensing and Photogrammetry
Current Course Credit Hours: 3
Proposed Course Credit Hours: 4
Rationale: The course has lecture/lab format similar to other 4 hour geospatial technology courses that are lecture/lab such as GEO526 (4 credits), GEO529 (4 credits), GEO530 (4 credits), GEO540 (4 credits), BSC510 (4 credits) and BSC511 (4 credits). The course has always had workloads comparable to those 4 credit hours courses, but this change of credit hours will also add a semester project to the course material. See attached syllabi.
Catalog Description: Scientific study of the earth using images and data captured using satellite- or aircraft-borne sensors, with emphasis on issues of acquisition, photogrammetric interpretation, spatial analysis, and application.

CURRENT SYLLABUS – (3 CREDITS)

Principles of Remote Sensing and Photogrammetry

GEO431/531: Fall 2015, Section 101 - CRNs 2441/2453

Instructor: L. Keith Evans	Time: Thurs. 6:30-9:00pm
Phone: 304.736.4273; Fax: N/A	Place: HH202
Office: HH202 (one half hour before/after class, as needed)	levans@marshall.edu
Web Sites: http://www.east-by-west.com, ArcGIS Server-based http://tagis.dep.wv.gov/mapservices2.html	

Catalog description:

Principles and techniques for preparing and utilizing remotely sensed data for visualization and analysis. 3 credit hours. (Prerequisite: GEO426 , or GEO429 , or GEO430 , or IST423, 3 credit hours)

Course Student Learning Outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this Course
Students will research sources for downloading existing remote sensing data for use in GIS projects	Weekly projects	Weekly projects, exams
Students will learn basic digital image processing techniques applicable to a broad array of geographic research	Weekly projects	Weekly projects, exams
Students experience creation of custom data products by experimentation with classification techniques applicable to remotely sensed data	Weekly projects	Weekly projects, exams

Required readings:

- Lillesand, Thomas M., Kiefer, Ralph W. and Chipman, Jonathan W., Remote Sensing and Image Interpretation, NY: John Wiley & Sons, Inc., 2008.

Organization of Class Time:

Class time will consist of the following: 1) lectures, presentations and examples of remote sensing and digital imagery analysis (=RS&DIA) including data collection, data input, and spatial analysis topics; 2) hands-on experience using ERDAS IMAGINE to complete RS&DIA exercises.

Time Outside of Class:

This class consists of more than simple class attendance. Expect to spend time outside class each week researching assigned RS&DIA areas of study necessary to complete weekly projects.

Grading:

Grades will be based on two exams (100 points each) and 10 projects [100 points total for all of the ten projects]). Projects shall be completed weekly (10 points each) as listed on the classroom agenda shown below in this document. The exact number of projects may change during the semester. It may also be necessary to have multiple business processes per project to insure proper coverage of some key RS&DIA, GIS, IT and business processes. The total number of points earned will determine final grades:

A = 300 - 270 points (100-90%)
B = 269 - 240 (89-80%)
C = 239 - 210 (79-70%)
D = 209 - 180 (69-60%)
F = 179 and below (less than 60%)

The dates for exams are listed on the classroom agenda shown below in this document. Exam format will be previewed before each exam.

Attendance Policy:

Absences threaten your chance of success in this class. You should make every attempt to attend every class. Topics emphasized in lecture, exercises, and readings will generally be emphasized on the exams. In-class exercises will each count for a 10-point grade, will be discussed **in class** and should be completed **in class**. In addition, time during class is the only time you will be guaranteed access to the computers. For these reasons, attendance is vital. **If you miss an exercise or exam for an UNEXCUSED reason, you will receive a zero for that exercise or exam.** If you will miss an exam for an excused reason, it MUST be taken before the class you will miss or made up before the next day of class. If you are not present for an excused reason on a day an exercise counts for a grade, you MUST either turn it in early or by the following class day. **Failure to follow these instructions will result in a ZERO on the missed exercise or exam.**

University policy states that excused absences include death in the family, uncommon illness (this does not include regular appointments), dean-approved major religious holiday, or institutional activity. For an absence to be excused you MUST provide adequate documentation to me BEFORE the class to be missed, or at the latest, at the next class. For a death in the family an obituary or other document stating your relationship to the deceased is acceptable documentation. For an emergency illness, you must provide a doctor's excuse that clearly states that your illness prevented class

attendance. Regular appointments are not excused absences. You must have written approval in advance from the appropriate dean for an approved major religious holiday. For an institutional activity, you must provide a signed document from the appropriate university official that clearly states that your activity will preclude class attendance. No excused absence is a license to miss additional assignments or classes, but only the specific date(s) of the excused absence. **If you do not follow these instructions for excused absences, your absence will be counted as UNEXCUSED no matter the reasons, and you will receive a ZERO for any missed quiz or exam.** Every effort should be made to inform me at least two days BEFORE a scheduled, excused absence. Missing 2 days or more (excused or unexcused) probably means FAILURE in this class.

The following are UNEXCUSED absences: work or work related absences, attendance at special functions for other classes, illness of a relative out of town, vacation, missed flights, car problems, illnesses that do not prevent class attendance (according to the doctor), marriage, honeymoons, marriage of relatives/friends, child care difficulties, appointments for interviews, pre-arranged travel plans, extending weekends or holidays by missing a Friday or a Monday or any day, or breaking up with your girl/boyfriend.

Academic Dishonesty:

University policy states that any act of a dishonorable nature that gives the student engaged in it an unfair advantage over others engaged in the same or similar course of study is prohibited. University sanctions for academic dishonesty may range from a lower final grade in or a failure of the course or exclusion from further participation in the class to dismissal from the institution. You must do you own work inside and outside of this class. Cheating in or out of this class is prohibited. **You will be given a final grade of F for any instance of cheating.**

Other University Policies:

By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802:

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment.

Schedule:

Chapter Number	PowerPoint Presentations	Lillesand & Kiefer Chapter Name	Lab Exercise Assigned Date	Lab Exercise Due Date	Date
Internet/Handouts	Week 1	Introduction to Instructor & Introduction to Course	N/A	N/A	Aug 27
Internet/Handouts/ Chapter 1	Week 2A – 2B	Concepts & Foundations of Remote Sensing	Intro to RS&IA	N/A	Sep 3

Internet/Handouts/ Chapter 2	Week 3	Elements of Photographic Systems	Intro to RS&IA (cont) & Lab Ex. **1**	N/A	Sep 10
Internet/Handouts/ Chapter 3	Week 4	Basic Principles of Photogrammetry	2	1	Sep 17
Internet/Handouts/ Chapter 4	Week 5	Introduction to Visual Image Interpretation	3	2	Sep 24
Internet/Handouts/ Chapter 4	Week 6	Introduction to Visual Image Interpretation (2nd week)	4	3	Oct 1
Internet/Handouts/ Chapter 5	Week 7	Multispectral, Thermal, and Hyperspectral Sensing	5	4	Oct 8
Internet/Handouts/ Chapter 6	Week 8	**Midterm Exam** & Earth Resource Satellites Operating in the Optical Spectrum	N/A	N/A	Oct 15
Internet/Handouts/ Chapter 6 (second half)	Week 9	Earth Resource Satellites Operating in the Optical Spectrum (2nd Week)	6	5	Oct 22
Internet/Handouts/ Chapter 7 (first 1/3rd)	Week 10	Digital Image Processing	7	6	Oct 29
Internet/Handouts/ Chapter 7 (second 1/3rd)	Week 11	Digital Image Processing (2nd. Week)	8	7	Nov 5
Internet/Handouts/ Chapter 7 (last 1/3rd)	Week 12	Digital Image Processing (3rd. Week)	9	8	Nov 12
Internet/Handouts/ Chapter 8	Week 13	Active Sensors – Microwave & LiDAR	10	9	Nov 19
N/A	Week 14	Thanksgiving Holiday	N/A	N/A	Nov 26
Internet/Handouts/ Unwritten Chapter 9	Week 15	Military Applications & World Events	N/A	10	Dec 3
N/A	Week 16	**Final Exam**	N/A	N/A	Dec 10

NEW SYLLABUS (4 CREDITS)

Principles of Remote Sensing and Photogrammetry

GEO431/531: Fall 2019, Section 101 – CRNs 2441/2453

Instructor: L. Keith Evans	Time: Thurs. 6:30-9:00pm
Phone: 304.736.4273	Place: HH202
Office: HH202 (one half hour before/after class, as needed)	levans@marshall.edu
Web Sites: http://www.east-by-west.com, ArcGIS Server-based http://tagis.dep.wv.gov/mapservices2.html	

Catalog description:

Scientific study of the earth using images and data captured using satellite- or aircraft-borne sensors, with emphasis on issues of acquisition, photogrammetric interpretation, spatial analysis, and application. (PR: GEO423 or GEO426 or GEO429 or GEO430 or IST423 or permission).

Course Student Learning Outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this Course
Students will research sources for downloading existing remote sensing data for use in GIS projects	Weekly class exercises	Weekly projects, exams
Students will learn basic digital image processing techniques applicable to a broad array of geographic research	Weekly class exercises	Weekly projects, exams
Students experience creation of custom data products by experimentation with classification techniques applicable to remotely sensed data	Weekly class exercises	Weekly projects, exams
Students will apply processing and interpretation to an independent research project.	Weekly class exercises, Weekly projects, exams	Semester Project

Required readings:

- Lillesand, Thomas M., Kiefer, Ralph W. and Chipman, Jonathan W., Remote Sensing and Image Interpretation, NY: John Wiley & Sons, Inc., 2008.

Organization of Class Time:

Class time will consist of the following: 1) lectures, presentations and examples of remote sensing and digital imagery analysis (=RS&DIA) including data collection, data input, and spatial analysis topics; 2) hands-on experience using ERDAS IMAGINE to complete RS&DIA exercises.

Time Outside of Class:

This class consists of more than simple class attendance. Expect to spend time outside class each week researching assigned RS&DIA areas of study necessary to complete weekly projects.

Grading:

Grades will be based on 10 Weekly Projects [100 points total for all of the ten projects]), two Exams (100 points each), and a Semester Project (100 points).

- Projects shall be completed weekly (10 points each) as listed on the classroom agenda shown below in this document. Class time will be used for practice exercises similar to the Weekly Projects.
- The dates for Exams are listed on the classroom agenda shown below in this document. Exam format will be previewed before each exam.
- The semester project will allow you to pursue a topic of interest to you, applying principles and techniques learned in the exercises and Weekly Projects. Additional instructions will be given in class.
- The total number of points earned will determine final grades:

A = 400 - 360 points (100-90%)
B = 359 - 320 (89-80%)
C = 319 - 280 (79-70%)
D = 279 - 240 (69-60%)
F = 239 and below (less than 60%)

Graduate students will have more extensive Weekly Projects, Exams, and Semester Projects.

Attendance Policy:

Absences threaten your chance of success in this class. You should make every attempt to attend every class. Topics emphasized in lecture, exercises, and readings will generally be emphasized on the exams. In-class exercises will prepare you for a homework Weekly Project, each of which counts for a 10-point grade. Weekly Projects will be discussed **in**

class and must be submitted **at the next class**. In addition, time during class is the only time you will be guaranteed access to the computers/software. For these reasons, attendance is vital. **If you miss a Weekly Project or exam for an UNEXCUSED reason, you will receive a zero for that Weekly Project or exam.** For an absence to be excused you MUST provide adequate documentation to me BEFORE the class to be missed, or at the latest, at the next class. Missing 2 days or more (excused or unexcused) probably means FAILURE in this class.

Academic Dishonesty:

You must do you own work inside and outside of this class. Cheating in or out of this class is prohibited. **You will be given a final grade of F for any instance of cheating.**

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Internet/Handouts/ Chapter 2	Week 3	Elements of Photographic Systems	Intro to RS&IA (cont) & Lab Ex. **1**	N/A	Sep 10
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Internet/Handouts/ Chapter 4	Week 6	Introduction to Visual Image Interpretation (2nd week)	4	3	Oct 1
Internet/Handouts/ Chapter 5	Week 7	Multispectral, Thermal, and Hyperspectral Sensing	5	4	Oct 8
Internet/Handouts/ Chapter 6	Week 8	**Midterm Exam** & Earth Resource Satellites Operating in the Optical Spectrum	N/A	N/A	Oct 15
Internet/Handouts/ Chapter 6 (second half)	Week 9	Earth Resource Satellites Operating in the Optical Spectrum (2nd Week); **Semester Project Part 1 due**	6	5	Oct 22
Internet/Handouts/ Chapter 7 (first 1/3rd)	Week 10	Digital Image Processing	7	6	Oct 29
Internet/Handouts/ Chapter 7 (second 1/3rd)	Week 11	Digital Image Processing (2nd. Week)	8	7	Nov 5
Internet/Handouts/ Chapter 7 (last 1/3rd)	Week 12	Digital Image Processing (3rd. Week)	9	8	Nov 12
Internet/Handouts/ Chapter 8	Week 13	Active Sensors – Microwave & LiDAR	10	9	Nov 19
N/A	Week 14	Thanksgiving Holiday	N/A	N/A	Nov 26
Internet/Handouts/ Unwritten Chapter 9	Week 15	Military Applications & World Events; **Semester Project Part 2 due**	N/A	10	Dec 3
N/A	Week 16	**Final Exam**	N/A	N/A	Dec 10