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|  | Course Syllabus (2016) |
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Last Date Revised: April 2016

I. COURSE NUMBER AND TITLE: Geographic Information Systems (GIS) and Environmental Remote Sensing

Days: Mon, Wed. 12:00 PM - 04:00 PM
 Building & Room: Forman Building, Room: Forman Computer Lab

II. INSTRUCTOR:

Matthew Johnston, PhD
 Phone: (954) 262-3641 Email: johnmatt@nova.edu
 Office: GHOCB, 5th Floor, # 506
 Office Hours: Daily, after class

III. COURSE DESCRIPTION:

This course assumes that you have an interest in Geographic Information Systems (GIS) and Remote Sensing. It is not intended to matter whether you consider yourself a chemist, physicist, biologist, geologist or geographer. The intention is to deliver practical experience in Geographic Information System (GIS) through analysis and visualization of spatial data gathered from tools to study the Earth, its processes, and its inhabitants. The course is designed to be accessible to anyone with a reasonable grounding in the Earth and Biological Sciences with basic computer skills and is tailored to give a general induction to a wide scope of relevant topics and spatial data. The syllabus introduces basic Earth observation principles and image classification is dealt with by providing a grounding in the basic theory underlying image processing. Analyses of commonly collected spatio-temporal biological data will be emphasized. Processing, visualization, and presentation of spatial data, generated from field studies and theoretical models, will be stressed for the purposes of analysis and publication in print and on the internet. This practical and real-world experience founded in RS and GIS theory can be brought forward to each student's individual thesis topic.

IV. COURSE LEARNING OUTCOMES*:

At the conclusion of this course the student:

- Will understand the fundamentals of GIS, its potential as well as its limitations. Remote sensing is presented as a portion of the GIS hierarchy and introduced using both marine and terrestrial examples.

- Will demonstrate a broad understanding of remote Earth-observation as presented during the course.
- Will be intimately familiar with the industry-standard software ArcGIS and its use in the context of RS, field, and theoretical spatial data. Upon completing the course, each student will be able to complete a wide range of tasks using ESRI Arc GIS.
- Will have ample opportunity to conduct case studies to answer specific environmental questions. The case studies cover a complete processing stream, from data acquisition, pre-processing, processing and finally, critical evaluation of the utility of the final map product. This experience will allow students to take what they have learned from the course and spatial-analysis via a GIS to their own projects.

V. REQUIRED TEXTS AND MATERIALS:

A text book will not be required. All materials are provided in accompanying Blackboard course.

VI. COURSE SCHEDULE AND TOPIC OUTLINE:

During the 2016 “ERS GIS” class, students will be required to attend classes, complete a series of computer labs during most classes, produce a final map project and also sit a final exam.

Class meetings: Mondays and Wednesdays from 12:00PM to 4:00 PM

Requirements for graduation from the course are: Demonstrate mastery of GIS through the computer labs, final project, and pass the final exam

| | Lecture | Practical |
|-----------|---|---------------------------------|
| Lecture 1 | Course intro + RS basics | |
| Lecture 2 | Intro to GIS continued | Intro to ArcMap |
| Lecture 3 | RS sensors and systems | Geographic features |
| Lecture 4 | Maps, Projections and GPS | Arc data import/vector analysis |
| Lecture 5 | Digital image analysis - Classifying images - supervised and unsupervised | Arc Supervised/Unsupervised |
| Lecture 6 | Spatial biological data | Spatial data |
| Lecture 7 | Advanced GIS - kernel densities, interpolation, data queries. | Advanced GIS |
| Lecture 8 | Online GIS | Online GIS |
| Lecture 9 | Revision and catch-up | |
| | EXAM | |

Note: This is a tentative schedule that may be changed.

VII. GRADING CRITERIA

Course Assignments and Grading Policy:

Grading will be split evenly (i.e., 25% each) between lab tutorials, homework, Final Exam, and Final GIS project.

The final exam will offer 100 points partitioned between short and long answer questions.

VII. COURSE REQUIREMENTS AND POLICIES:

ATTENDANCE

As a requirement for accreditation, regular attendance is necessary. Students who miss class are responsible for the material. Each professor has the responsibility to enforce class attendance. To fulfill this requirement, students must have logged in, accessed, and/or interacted with the majority of online course requirements (e.g. assignment submissions, asynchronous discussion) by the first week of the session or they may be withdrawn from the course by the instructor through the Program Office. For this reason, if students anticipate or encounter any reason why they may be unable to engage with their online coursework for an extended period during a term, they must communicate this to their instructor and the Program Office as soon as possible. Students do have the option of requesting an Incomplete; if this is granted by their instructor, they then have 3-months from the end of the term date to submit the required course work as decided with the instructor. An incomplete grade agreement form must be completed and filed with the distance education office. An instructor reserves the right to request original written documentation to substantiate any such absences. A falsified excuse is cause for disciplinary action. An Incomplete course graded I must be completed in one semester or the grade is changed to F. All students are referred to the section

3.5.2. of the Oceanographic Center catalog (<http://nova.edu/ocean/forms/nsuoc-2014-2015-catalog.pdf>) for details on course withdrawals and refunds.

ACADEMIC HONESTY

In order to ensure the highest standards of academic honesty and ethical behavior, the NSU policies on cheating and plagiarism will be strictly enforced. See the NSU Student Handbook for more information at <http://www.nova.edu/cwis/studentaffairs/forms/ustudenthandbook.pdf>. I am empowered by the policy to penalize a student suspected of academic dishonesty, plagiarism, or otherwise misrepresenting work and I will do so and report that student to the Dean of the OC. Nova Southeastern University has contracted with **turnitin.com** to provide plagiarism detection services, and I will submit any suspicious documents to this service.

The use of cell phones, or any other electronic devices not specifically allowed by me, during an exam is not permitted. The use of such devices for any reason will be assumed to be for the purposes of cheating and will result in your dismissal from class and administrative action up to permanent expulsion from all NSUOC programs. If you need the phone for emergency

notifications, or the like, leave the phone with me or the proctor at the start of class. You will be immediately notified if there is an incoming call.

EXPECTATIONS

You can expect that I will arrive on time for lectures and be well prepared. You can expect that I will be clear about my expectations and the criteria I use in assigning grades and that I will be fair and equitable. I will treat everyone in the class with consideration and respect.

I expect you to come to class, arrive on time, and be prepared for lecture and lab. I expect you to turn off your cell phones, pagers, and hand-held electronic devices as a gesture of reciprocal respect. If you bring a computer to class, I expect you to use it to take notes and record classroom information. I expect you to stay awake, take notes, participate in discussions and ask questions. I expect you to turn in your assignments on time and in good condition.

X: UNIVERSITY-WIDE POLICY STATEMENTS

A. Academic Misconduct: Academic misconduct appears in a variety of forms (including plagiarism). It is a violation of NSU academic policy and may be punished in a variety of ways, from failing the assignment and/or the entire course to academic probation, suspension or expulsion. If you have questions about what constitutes academic misconduct before handing in an assignment, see your instructor or the NSU Student Handbook at <http://www.nova.edu/cwis/studentaffairs/forms/ustudenthandbook.pdf>.

B. ADA Policy: Nova Southeastern University provides accommodations for students with documented disabilities. If you have a disability for which you believe you require accommodation, please contact Academic Services (<http://www.nova.edu/disabilityservices/>, 954-262-7189).

C. Last Day to Withdraw: Due to the compressed nature of this course you will be able to obtain a full refund of your tuition up to **Date Changes per TERM**. There will be no refund after that date. None of the lab fee is refundable; however you will own the airline ticket that was purchased for you. It is your responsibility to formally withdraw by completing the appropriate forms to obtain a refund (<http://www.nova.edu/ocean/coursepolicy.html>). A request for tuition refund must be made in writing at the time of withdrawal. Refunds will be made solely at the option of the university and will be based on the legitimacy of the reason for withdrawal. Should you fail to appropriately withdraw from this course, and then earn a grade below your expectations, I will do what I can to see that the grade is reported on your transcript. I will **NOT** backdate paperwork so that you can avoid earning a grade lower than you like.

D. Email Policy: All email communications between students and faculty must be conducted via NSU email accounts (<http://www.nova.edu/common-lib/policies/emailcomm.policy.html>). This requirement will assist NSU in communicating more effectively and protecting your privacy. Emails sent to faculty from non-NSU accounts will be returned to the sender with instructions to resend the communication from your NSU account. To set up an NSU email account or to get help with an existing account, go to <https://www.nova.edu/>

[sbin/account request](#). Also, the computer help desk is available to assist you with questions regarding your NSU email account. It can be reached at 954-262-HELP (4357).

E. Student Course Evaluations: Student comment and feedback evaluating each college class is an important tool to evaluate program effectiveness. Participation in this process is a responsibility of each student.

F. Grading System

The following system is used to grade academic performance:

| GRADE | DESCRIPTION |
|--------------|--|
| A | Excellent |
| B | Satisfactory |
| C | Marginal Pass |
| D | Poor |
| F | Failure |
| W | Withdrawal: Given after the third class week or termination by the instructor for non-completion of the course by the student. |
| I | Incomplete: Given when most (80 percent), but not all, work has been completed. |
| Au | Audit |
| P | Pass |

Professors may use + or – in grading. **However, the grading scale ranges from A to D-, no A+ or F+ are awarded.** A grade of incomplete (I) must be requested from the instructor, have the Associate Dean’s approval, and be accompanied by a **completed contract specifying outstanding course requirements and completion dates.** Completion of the course graded incomplete must occur within one semester (or 3 months) of the end of the course and the incomplete be changed to a different grade. If the course is not completed in 3 months, or the student has not withdrawn and received a W, the incomplete will automatically be converted to a grade of F. Under unusual circumstances students may request a time-extension to complete the course. Such requests must be submitted to, and approved by, the Associate Dean of Academic Programs prior to the end of the 3-month time limit. **There are no exceptions to this rule. Securing the completed and signed incomplete contract forms is the responsibility of the student.**