ESF 300 Introduction to Geospatial Information Technologies
Course Syllabus

INSTRUCTOR:	**Eddie Bevilacqua** (301 Bray Hall, 470-6697, ebevilacqua@esf.edu)		
OFFICE HOURS:	Open door, or by appointment		
TEACHING ASSISTANTS:	**Cheryl Bondi**	B7 Marshall	cbondi11@gmail.com
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SCHEDULE OF CLASSES:	Lectures	Monday & Wednesday	11:40 –12:35 am (5 Illick)
	Laboratories	Section 1 Friday	11:40 – 2:40 pm (437 Baker)
		Section 2 Thursday	12:30 – 3:30 pm (314 Baker)
		Section 3 Wednesday	1:50 – 4:50 pm (309 Baker)
		Section 4 Thursday	4:00 – 7:00 pm (314 Baker)
		Section 5 Wednesday	5:00 – 8:00 pm (314 Baker)
WEB PAGE:	http://blackboard.syr.edu		

PROVERB: "I hear and I forget; I see and I remember; I do and I understand."
"Those who fail to plan, plan to fail"

PREREQUISITES:

- No formal prerequisites, but students are expected to have
  basic math skills (geometry & trigonometry) and
  computer skills (organizing files and folders, downloading and uncompressing files)

REQUIRED TEXT:

- Bolstad, P. *GIS Fundamentals: A first text on Geographic Information Systems (3rd ed).*
  (This text is available at the Orange Book Store)

COURSE OBJECTIVES:

The overall goal of the course is to provide students with the theoretical and practical knowledge necessary to understand the uses and limitations of geospatial information technologies (GIT) [i.e., remote sensing (RS), global positioning systems (GPS) and Geographic Information Systems (GIS)] for environmental science and natural resources management applications.

The objectives of this course are to:

1) increase student awareness of GIT science in environmental sciences & natural resources management;
2) introduce fundamental tools used for mapping natural resources;
3) provide experience in mapping land cover conditions using maps, GIS data, aerial photographs, satellite images, and navigation-grade GPS technology;
4) provide experience in digital spatial analysis techniques; and
5) generate enthusiasm and interest in using GIT for meeting environmental science and natural resources management needs.

MEASURABLE LEARNING OUTCOMES OR COMPETENCIES:

By the end of this course, the student will be able to:

1. **Define**, **compare** and **contrast** different types of maps and **explain** fundamental principles of cartographic design
2. **Define**, **compare** and **contrast** raster and vector data structures used in GIS software
3. **Compare** and **contrast** different map projections and coordinate systems used for geo-referencing locations on the earth's surface
4. **Compare** and **contrast** the major characteristics of different types of remote sensing data available for environmental and natural resource applications, including satellite imagery, and explain the advantages and disadvantages of each
5. **Collect** and **input** geo-referenced data from a variety of sources, including maps, digital imagery and recreation-grade GPS, for use in a GIS
6. **Define** and **explain** the sources of error in digital data
7. **Manage** and **query** both spatial and attribute data within a GIS to answer specific environmental and natural resource management questions
8. **Apply** appropriate spatial analysis procedures within a GIS, using both raster and vector data, to answer specific environmental and natural resource management questions
9. **Create** quality maps which summarize output from simple spatial analyses using appropriate cartographic design principles
10. **Demonstrate** professionalism

GRADING POLICY:

1. ATTENDANCE:
   Class attendance is vital -- absences, for any reason, do not relieve the student of the responsibility for laboratories, quizzes and lecture materials covered during the absence.

2. LABORATORY REPORTS:
   Laboratory Assignments are due at the end of the day (11:59 pm) of your laboratory period, unless stated otherwise.

   Late laboratory assignments will be **severely penalized**:
   - 50% grade reduction if turned in 1 to 24 hours late;
   - 100% grade reduction if turned in over 24 hours late!

3. EXAMS:
   Exams will be comprehensive and will cover all materials presented in lectures, laboratories, and reading assignments

4. WEIGHTS:

Lab Assignments (14)	55%
Homework/Quizzes	10%
Term Project	15%
Final Exam	20%
TOTAL	100%

5. GRADING SCALE:

Grade	A	A-	B+	B	B-	C+	C	C-	D	F
Min %	93	90	85	80	75	70	68	65	60	<60

TENTATIVE LAB SCHEDULE (MAY CHANGE)

WEEK OF	TOPIC
JANUARY 17	1. MAPPING BASICS – GEOMETRY & INTERPRETATION
JANUARY 24	2. INTRO TO IDRISI & DIGITAL DATA MODELS – RASTER VS VECTOR
JANUARY 31	3. IDRISI – IMAGE PROCESSING I
FEBRUARY 07	4. IDRISI – IMAGE PROCESSING II & MAP ACCURACY ASSESSMENT
FEBRUARY 14	5. INTRO TO ARCGIS
FEBRUARY 21	6. ARCGIS – VECTOR DATABASE CREATION
FEBRUARY 28	7. ARCGIS – ATTRIBUTE TABLE JOINING, DATA QUERIES & MANAGEMENT PLANNING
MARCH 07	8. ARCGIS – SPATIAL ANALYSIS I – POINTS AND POLYGONS
MARCH 14	SPRING BREAK – NO LAB
MARCH 21	9. ARCGIS – SPATIAL ANALYSIS II – RASTER AND POLYGONS
MARCH 28	10. INTRO TO GPS AND SPATIAL DATA ACCURACY
APRIL 04	11. ARCGIS – DATA ACQUISITION AND DATABASE CREATION USING GPS
APRIL 11	12. ARCGIS – SPATIAL ANALYSIS III – SPATIAL INTERPOLATION
APRIL 18*	13. ARCGIS – SPATIAL ANALYSIS IV – DEM AND SURFACE ANALYSIS
APRIL 25	14. ARCGIS – CARTOGRAPHIC MODELLING & SITE SELECTION

*APRIL 22 - GOOD FRIDAY (NEED TO RESCHEDULE FOR SECTION 1)