Geographic Information Systems Project

Course Outline

Contact Information

Instructor: Peter Glenday, PhD Candidate, Department of Geography and Environmental Management,
Office: EV1-219,
Office Hours: TBD.
If you need to schedule an appointment outside of these drop-in hours, please contact me.
Phone: (519) 888-4567 ext. 30381
E-mail: pjglenda@uwaterloo.ca
From Monday to Friday, I make every effort to answer emails within 24hrs. Email sent on the weekend will normally be answered on the following Monday.

Teaching Assistant

TBD:
Email:
Lab/Office Hours:

Course Presentation

Lecture:
Thursday, 11:30-2:20 pm. MC 4060
N.b. Beginning Jan.14th, class will be held in the Magellan Lab EV2-1014

Reserved lab time: Geddes Lab EV2-1002A
Wednesdays, Thursday 8:30-10:20 am.

The Geddes, Galileo, and Magellan Labs
Although lab time is not specifically scheduled for this course, access to the Geddes, Galileo, and Magellan labs is available when those labs are not booked for a specific class. Access to the labs is gained by entering a code in the keypad combination lock on the door of the lab. Do not give the combination to anyone else. Everyone who needs to get into the Lab can obtain the combination from the Mapping, Analysis and Design (MAD) Helpdesk in EV2 163A or from their course instructor.

Please make sure you carefully backup all digital files that you use or create in this class. Do not leave any of your files on the local lab computer.

Please note: No food or drink is to be brought into the labs.

Additional Course Resources

University of Waterloo LEARN Course Environment
Learn is a web-based course management system that enables instructors to manage course materials (posting of lecture notes etc.), interact with their students (drop boxes for student submissions, on-line quizzes,
discussion boards, course e-mail etc.), and provide feedback (grades, assignment comments etc.). Data files required for lab assignments will also be found here.

Logging Into LEARN
You can access the LEARN website with the following URL: http://learn.uwaterloo.ca

Provide your WatIAM userid and password. Once you have logged in, you should see a list of your LEARN. Clicking on the course name will take you to that course.

Checking Your WatIAM UserID and Password
Your password can be checked by going to: https://watiam.uwaterloo.ca:8181/idm/user/login.jsp

If you can’t get on after checking and resetting your password, please confirm with your instructor that you are on the class roster.

Evaluation

Final grades for the course will be assigned as follows:

- Bio, skillset, research interests          02%
- Team project evaluation
  - Proposal, Project Plan & Pitch          15%
  - Requirements & analysis               10%
  - High Level Design                    05%
  - Detailed Design                       05%
  - Data sourcing and loading             10%
  - Development and/or Analysis           10%
  - Testing, Validation & Quality Metrics  05%
- Results publication
  - Web Page, Dashboards, Hardcopy, App    25%
  - In class team results presentation     05%
- Individual and team peer evaluations    08%

100%

Note: The first assignment, the bio, is submitted individually. All other assignments are submitted by the teams of 3-4 people. Projects must be newly developed and clearly differentiated from past or present coursework. Assignments must be submitted to the appropriate drop box on LEARN by each member of the group by 11:55pm on the due date. Late assignments will not be accepted unless there is a documented medical reason.

Weekly group meetings will focus on reviewing tasks completed over the previous week, and setting tasks to be completed in the following week. Where individuals have not made weekly progress, or submitted a progress report, the instructor may assess a 2% penalty for each instance in which significant progress has not been made.

The instructor reserves the right to adjust final marks up or down, based on performance and participation, for each student in a group.
Objectives

The overarching goals of this course are: to develop a sound understanding of the principles, techniques and methodologies required of a geospatial project within a project management framework, specifically a Waterfall Structured Development Lifecycle (SDLC). A SDLC has a number phases and deliverables including, but not limited to: proposal development; scoping; planning; resourcing; requirements analysis; design; development, and; implementation and/or results presentation. There will be key deliverables at each phase of the SDLC that the teams will be evaluated on.

There is a wide array of project opportunities in Applied GIS or Geospatial IT, i.e., an application, web app, or extension to geospatial software or tools, but all must have the following base line requirements:

- Must employ a Waterfall SDLC with key deliverables (templated documents provided by instructor) at each phase including a project plan with a fully formed Gantt chart
- Must use a RDBMS to store, access, query data used in a project
- Must use CASE tool to document data model(s)
- Must publish results in web page*
  *Cannot use mapbox, Google fusion tables or other online simple mapping capabilities

The overarching objectives of this course are as follows:

1. To develop sound geospatial research skills and experience
2. To develop team building and collaboration skills along with project/time management skills
3. To establish project goals that stretch and challenge the individuals and teams
4. To provide students with experience proposing, documenting, and managing a geospatially focused project that leads to the development of useful, actionable knowledge for decision support.
5. To enhance and build on the student’s GIS skills to navigate the world of NeoGeo outside the bounds of traditional workstation GIS

Text and Readings

There is no required textbook for this course. Course materials will be provided electronically on LEARN. Students are expected to work independently to access the information they need to complete the project. Course notes, lecture presentations, links to readings and tutorials will be provided in this syllabus and on the Desire2Learn course web site (http://learn.uwaterloo.ca). Students are expected to make extensive use of the ArcGIS, Oracle Spatial and FME on-line help and web resources. Selected links will be provided on the course website.

The following books cover spatial analyses that may be used in the course, are suitable for further reading, and are available electronically online or via the Dana Porter Library.

Library:


Peter J. Glenday, Department of Geography and Environmental Management, University of Waterloo

Schedule
The class meets from 11:30-2:20pm on Thursdays in MC-4060, though after the 1st class we’ll meeting in the Magellan lab EV2-1014. Table 1 details the course schedule, lecture topics, required readings, resources, tutorials, assignment hand out and submission dates.

Learning modes and course format
This course builds upon the understanding of GIS concepts you gained in Geography / Planning 281 through a series of compulsory lectures, tutorials and lab sessions. Lectures will be used to discuss concepts, principles and techniques of geospatial database analysis, design and implementation coupled with access, query, and reporting processes using data held in a database. The third hour of the class will be used for workshops, lab demonstrations and/or for you to work on your assignments.

Hands-on work with ArcGIS, FME and Oracle Spatial, SQL Developer/Modeler will take place in the Galileo lab (EV1-240). The lab assignments are designed to build your skills in using GIS and database software systems and tools to strengthen your understanding of how geospatial analytics can be properly applied to real world problems. The Galileo lab (EV1-240) has been reserved GEOG/PLAN 387. See above for dates/times.

Note that developing a strong understanding of geospatial database concepts and the corresponding practical skills necessary to complete the assignments requires a significant investment of time. In addition to the scheduled class and lab time, students should expect to spend at least 5 hours per week working on course assignments. These time requirements will vary from student-to-student. Students who are unwilling or unable to make this time commitment should consider other courses.

Resources

Computer Labs
Make use of your scheduled lab time in the Galileo (EV1-240). You can also use the Geddes (EV2-1002A) or Galileo (EV1-240) labs for practical work when they are not booked for other courses. The required software is also available in the main MAD lab (via festerm1.uwaterloo.ca) and can be accessed from off-campus by logging in to the terminal server (festerm1.uwaterloo.ca).

Note: No food or drink is allowed in the labs. Failure to abide by this rule may result in your computer accounts being suspended.

Course Website
A website for this course has been created as part of the Desire2Learn (D2L) system. Students in the course can access the course website by going to the D2L homepage (http://learn.uwaterloo.ca) and entering their UW userid and password in the logon form displayed on this page.
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<th>Lectures</th>
<th>Tutorials</th>
<th>Workshops/Demos</th>
<th>Resources</th>
<th>Deliverables</th>
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<td>ArcGIS QGIS</td>
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<td><a href="http://www.esri.com">http://www.esri.com</a> <a href="http://www.qgis.org">http://www.qgis.org</a></td>
<td>Upload bio, skillset, research interests to Learn</td>
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<td>Feb.11</td>
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<td>Detailed Design with Data Model, workflow</td>
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<td>Data sourcing and ETL</td>
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<td>Weekly Progress Report</td>
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<td>Reading Week</td>
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<td>Development and/or analytical processing</td>
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<td>Feb.25</td>
<td>Team meetings with instructor</td>
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<td>Mar.03</td>
<td>Team meetings with instructor</td>
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<td>Weekly Progress Report</td>
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<td>Mar.24</td>
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<td>Team Peer Evaluations</td>
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Getting Help
Students are expected to get into the habit of using the on-line resources as the first source of help. I will be available in my office for consultation during regular office hours or by appointment. Additional help is available during the scheduled lab sessions and from the MAD help desk.

UW Policies

**Academic Integrity:** To create and promote a culture of academic integrity, the behaviour of all members of the University of Waterloo is based on honesty, trust, fairness, respect and responsibility.

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4, [http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm)

**Discipline:** A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline, [http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm)

**Appeals:** A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read Policy 72 - Student Appeals, [http://secretariat.uwaterloo.ca/Policies/policy72.htm](http://secretariat.uwaterloo.ca/Policies/policy72.htm)

**Ethics:** The University of Waterloo requires all research conducted by its students, staff, and faculty which involves humans as participants to undergo prior ethics review and clearance through the Office of Research Ethics ([http://iris.uwaterloo.ca/ethics/](http://iris.uwaterloo.ca/ethics/)). The ethics review and clearance processes are intended to ensure that projects comply with the guidelines established through Tri-Council Policy Statement (TCPS).

**Note for students with accessibility needs:** AccessAbility Services, located in Needles Hall, Room 1132, collaborates with all academic departments/schools to arrange appropriate accommodations for students with accessibility-related needs without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

**Illness or other emergency:** Students with an illness, or other emergency, that prevents them from handing in an assignment on time or attending a test, must contact you to notify you of this problem prior to the deadline or test date (or as soon afterwards as is reasonably possible). Students with an illness must document evidence of that illness with a note from a doctor. For other emergencies, such as the death of a family member, students should be asked to meet with you as soon as possible in order to make arrangements to make up any missed assignment or test. Any questions or concerns that you have regarding these matters should be directed to the Department Chair or Associate Chair.
**Religious Observances:** Please inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

**Turnitin Software:** Plagiarism detection software (Turnitin) may be used to screen assignments in this course. This is may be done to verify that use of all materials and sources in assignments is documented. Students will be given an option if they do not want to have their assignment screened by Turnitin. In the first week of the term, details will be provided about arrangements and alternatives for the use of Turnitin in this course.

**Annotated bibliography:**

For advice on how to prepare an annotated bibliography, see: http://www.lib.sfu.ca/help/writing/annotated-bibliography