CRP 444 Advanced Programming in GIS

Instructors: Erhan ÇINAR

Course Syllabus

DESCRIPTION

CRP 444 is an introductory course in programing with the GIS libraries. The course is presented mainly in two parts as Programming and GIS Libraries respectively. The first part introduces Java programming language and technics that enables students to use GIS libraries on their applications to be developed. Second part aims to use GIS libraries and let the students create their own software applications.

OBJECTIVES

The goal of the course is to provide students with basic programming and use of GIS libraries knowledge. Upon completion of the course, students should be able to:

• write basic programs to solve daily problems
• understand the difference between user vs developer perspectives
• start thinking of object oriented approach on daily issues raised
• will have a true understanding of software libraries especially on GIS components
• create their software applications on GIS and other domains

TOPICS

The topics listed below indicate the general sequence of content areas presented in the lecture.

- Java Programming
  - History
  - Java Virtual Machine
  - Characterictics of Java Programming Language
  - Development Process with Java
  - Basic Java
  - Procedural Java
  - Introduction to Objects
  - More Objects
- Midterm
  - Introducing Applets
  - Components
  - Events
  - Layout Managers, Windows, and Dialogs
  - Images and Menus
  - I/O and Streams
  - Threads
- GIS Programming
  - A Basic GIS Application to Display Maps
  - Adding Display Controls
  - Adding Status Reporting
  - Getting Map Features and Feature Properties

- Adding Profile Analysis Capability
- Adding Line-of-Sight Analysis Capability
- Adding Overlays and Style Controls
- Creating Themes (Vector and 3D – i.e. slope theme)

❖ Final Exam

TEXTBOOKS and LAB MATERIALS

There is no required textbook incase for any interest.

Nell Dale, Chip Weems, Mark Headington, Introduction to Java and software design, Boston : Jones and Bartlett Publishers, 2003.
QA76.73.J38 .D343

Y. Daniel Liang, Introduction to Java programming: brief version, Upper Saddle River, N.J. : Pearson, 2011
QA76.73.J38 L52

The instructor will provide the integrated development environment tools Eclipse and Java SE 1.7. Students are encouraged to bring and use their personal laptops to faciliate home works.

The instructors reserve the right to make additional required reading or lab materials available from time to time.

GRADING

The assessment of student achievement in the course will be based on attendance, seminar presentation and paper, completed laboratory exercises, final project presentation and report, and a final exam.

There will be four problem sets and a comprehensive final examination. The point distribution for the problem sets, exams and lab assignments is as follows:

Lab Exercises + Seminar presentation and paper + Attendance → %30

Midterm → %30

Final Exam → %40

Exam Policies

The exams are handled on a paper based methodology and students are asked to;

❖ Fill in the missing values
❖ Describe the methodology for the given problems.

Early or rescheduled presentation and final exam dates are not offered.

*Make up exam will be given, after the finals period, **only** to those students who have a **valid, officially documented excuse.***
(METU Academic Catalog, Article 9, http://www.oidb.metu.edu.tr/english/regulations/oidb41a.htm)

Late Work Policy

In general, submitting **laboratory assignments** after the specified completion date is not considered acceptable for University students. Late labs or papers will be penalized as follows:
1 day late -- evaluated points MINUS 10%
2 days late -- evaluated points MINUS 20%

Late work *will NOT be accepted more than two weekdays past the due date. In extreme cases of personal misfortune this policy can be extended ONLY by special arrangement with the instructor*.

LABORATORY WORK

Lab work is due one week after it is assigned, unless otherwise specified. Most students will be able to complete all lab work during the laboratory period. If you are unable to complete a lab during regular lab hours, there can be some scheduling with the GIS lab. Please see the lab assistant to arrange proper time.

ACADEMIC INTEGRITY

Students are encouraged to share intellectual views and freely discuss principles and applications of the course materials. Graded lab work and other exercises must be executed independently, except as authorized by the instructor. This course will conform to the University Academic Rules and Regulations (http://www.oidb.metu.edu.tr/english/regulations/oidb41a.htm).

CLASSROOM BEHAVIOR

Students and instructors each have responsibility for maintaining an appropriate learning environment. Our class shall maintain high standards of student and instructor conduct. The use of cell phones and pagers during lecture or lab sections is inconsistent with an appropriate learning environment and is, therefore, prohibited. Disrespectful or threatening behavior by students toward other students or instructors is unacceptable and is governed by University policies on such behavior.

ABSENCE POLICIES

Students are expected to attend and participate in all lecture and lab section meetings.

PREREQUISITES

All students enrolling in this course must demonstrate computer competency to the satisfaction of the instructors. **The course is not intended for those students having no computer literacy or those who are otherwise challenged by information technology**. Deficiencies in computer literacy will be the responsibility of the student.

Previous programming knowledge and expertise is welcome, bot not necessarily required.

OFFICE HOURS

The instructors are available outside of class for students **only** if students scheduled meetings previously.

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Instructions for Subscribing to the CRP 444 Mail Group

One of the requirements in this class is for every student to subscribe to the class Mail Group. A Mail Group is a tool used to send information (e.g., class assignments, exam information and schedule changes) on to a group of people. One assumption being made is that everyone has an email account and knows how to access it. If you do not have an email account please get one as soon as possible.

Subscribing to the CRP444 Mail Group

1. Start your email software and create a new email message.

2. The *"To:"* address to use to subscribe to the list is crp444@googlegroups.com

You can leave the "Subject:" of the message blank or if your email software forces you to have a message subject type in anything you like. The Mail Group will ignore it.

The text of the message is a single command line that the computer that manages the list understands. The line is: subscribe crp444

Send the message