



Department of Geography and Geoinformation Science

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GG5 590
Spatiotemporal Databases
(Spring 2015)

1. General Information

Instructor: Dr. Dieter Pfoser
Where: Fairfax Campus, Geoint Lab (Research Hall - Rm 290)
When: Thursday 4:30pm to 7:00pm.
Course website: Blackboard
Credits: 3.0
Prerequisites: None (besides eagerness to learn)

Instructor’s Office Hours: Monday, 6pm-7pm

2. Course Objectives

This is a graduate-level advanced course on the concepts and principles of spatial and moving objects databases. The goal of this course is to enable students (i) to develop a good understanding of the particularities of spatio-temporal data and (ii) explore means for the management and analysis of such data.

The course will take a case-based approach in which students explore specific data challenges and their respective solutions. Students will learn about different types of spatiotemporal data and techniques for analysis, management and visualization.

This course provides students with advanced knowledge in computer and information science. Specifically, the course offers students the opportunity to study and critically examine the outcome of state-of-the-art research projects in the area of spatial and spatiotemporal data management. As part of this process, students will also obtain general skills like how to find and review research literature, present their findings in well-prepared PowerPoint presentations, write down their findings in an essay, and contribute to and lead technical discussions.

3. Course schedule

The course will be taught as a combination of lectures, topic/problem oriented discussion, and student presentation of selected research topics.

4. Textbooks

There is no textbook. Students will be given handouts and research papers.

5. Course outline (tentative)

In this course we will cover the following topics (please note that the topics and their order are subjected to change at the discretion of the instructor, any changes will be announced in class):

Week of	Lec. #	Topic
01/22	1	Introduction and course overview – emerging trends and challenges
01/29	2	Selected topic
02/5	3	Selected topic

02/12	4	Selected topic
02/19	5	Student presentation 1
02/26	6	Student presentation 2
03/5		Student presentation 3
03/12	7	SPRING BREAK
03/19	8	Workshop
03/26	9	Student presentation 4
04/2	10	Student presentation 5
04/9	11	Student presentation 6
04/16	12	Student presentation 7
04/23	13	Workshop
05/30	14	Project presentations

6. Attendance

You are required to attend all class meetings. Your active participation in class is essential to the success of this course.

7. Grades

Each task will be given a numerical grade on a 0-100 scale. At the end of the term all the marks will be totaled as a weighted average according to the following weights:

Class participation	20%
Presentation	35%
Project	45%

Final grades at the end of the course will be assigned using a combination of absolute achievements and relative standing in the class.

8. Class participation

Given that this course is a research seminar, your active participation in the class is important and will significantly impact your final grade.

9. Presentation:

Each student is required to give an overview of an assigned research topic in a slide presentation to the class and to lead the ensuing discussion in class. Research topics are defined by the instructor. For each research topic, an important research paper is provided to the student by the instructor. The student has to extend this list of publications through an extensive literature study and to submit this list to the instructor. Based on the quality and the acceptance of the submitted publication list by the instructor, the student must study the papers, structure them, compare them, and design a slide presentation yielding the main results of the study.

Students will be evaluated based on the quality of the submitted list of publications, the organization of their slide presentation, the clarity and comprehensibility of their talk as well as on the knowledge and depth of the presented material (as demonstrated during the presentation as well as during the discussion in class).

The slide presentation will contribute 35% to your grade. In detail, the following list of criteria will be used to evaluate your slide presentation:

- Quality of the submitted list of publications (15%)
 - – Have appropriate publications been selected?
 - – Is the list of publications “rather complete”?
- Organization of the slides (35%)
 - Was the presentation well structured?
 - Did the presentation have a clearly defined goal/focus/message?
 - Did the presentation give the essential facts and results?
 - Were there any important aspects of the topic that were missing or only partially covered?
- Clarity and comprehensibility of the talk (15%)
 - Was the presentation easy to follow?
 - Did the presenter express his/her thoughts with a clear, loud, and expressive voice?

- Did the presentation include a demo (this is optional)?
- Knowledge and depth of the presented material (35%)
 - Was the material covered at a depth that is adequate for the class taking also into account the preparation time and background of the presenter?
 - Was the presenter able to answer questions from the audience?
 - Was the presenter successful in involving the audience in a discussion (e.g., by preparing questions)?
 - Was the presenter knowledgeable about related literature? The slide presentation has to be submitted to the instructor before the date of presentation at an individually announced date.

10. Project

Each student is also required to write and complete a semester-long report with respect to an assigned research topic. Research topics are defined by the instructor. For each research topic, an important research paper is provided to the student by the instructor. The student has to extend this list of publications through a literature study and to submit this list to the instructor. Based on the quality and the acceptance of the submitted publication list by the instructor, the student must study the papers, structure them, compare them, and formulate the findings as a Related Work section in the report.

The research report has the following fixed structure (a template will be provided):

- Title page
- Table of Contents
- 1 Introduction
- 2 Related Work
- 3 <Conceptual section about assigned research area (select own section heading)>
- 4 Conclusions References

Additional and appropriate subheadings and subsubheadings have to be inserted by the student. The instructor expects a report of *sufficient* length (20 pages ≤ length of report ≤ 30 pages). The report should give an answer to at least the following aspects:

- Give a clear description of the research topic and the problems that you have considered and investigated. Why is it a worthwhile research topic? Why should we care about these problems? What is difficult/challenging/interesting about them?
- Give a brief summary of the work/technologies most related to your project.
- Give a description of the general solution approach in the literature if any exists (conceptual work).
- Describe the outcome of your investigation including any contributions you have made (conceptual work).

The research report must be provided electronically as a PDF file through blackboard. The filename should be of the form <author>.pdf. Formats other than PDF will not be accepted. Students will be evaluated based on the quality of the submitted list of publications, the structure of their report, the quality of the contents, knowledge and depth of their report, the clarity and comprehensibility of their writing and language, and the spelling and grammatical correctness of their writing. The research report will contribute 45% to your grade. In detail, the following list of criteria will be used to evaluate your research report:

- Quality of the submitted list of publications (10%)
 - Have appropriate publications been selected?
 - Is the list of publications “rather complete”?
- Structure of the report (10%)
 - Does the structure of the report make sense?
 - Is the structure of the report logically consistent?
 - Does the structure of the report clearly reflect the intended goal/focus?
- Quality of the contents, knowledge and depth of the report (60%)
 - Is the contents of the report of high quality? Is it sound and complete?
 - Has related work been studied, compared, and described in an appropriate way?
 - Has the student’s own conceptual work been sufficient and has it been adequately described?

- Has the student's own implementation work been sufficient and has it been adequately described?
- Is the material covered at an appropriate depth?
- Clarity and comprehensibility of writing and language (10%)
 - Is the report easy to read and easy to understand?
 - Is the report written in complete English sentences? Bulleted lists are not enough.
 - Is the report clear and precise in explanations and statements as it should be in technical documents? Does it avoid colloquialisms?
- Spelling and grammatical correctness of writing (10%)

The deadline for the research report, which has to be submitted to the instructor, will be announced by him. No late submissions will be accepted.

11. Course website:

The course has a Blackboard website. This website will provide you a single portal through which you may obtain lecture notes, retrieve assignment data and, review links to additional materials, and receive special announcements. You are required to visit the course website **regularly**. Please notify ITU (and, if necessary, the instructor) if you encounter any problems accessing this website.

12. Electronic communication:

All course related email correspondence, including submission of assignments, should be made through the course Blackboard website. Please DO NOT send emails to the instructors' @gmu.edu address.

13. Students with special needs:

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS - <http://ods.gmu.edu>. Please do not hesitate to contact me regarding your special needs if you encounter any problems.

14. Academic integrity:

George Mason University is committed to the **highest standards** of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the GMU honor code (online at <http://academicintegrity.gmu.edu>).

15. General guidelines for ASSIGNMENT preparation and submission

- a. Grades of assignments will be based on:
 - **Academic merit** of your answers.
 - **Conciseness** and **completeness** of your answers. Please write to the point and explicitly address the question or task. Avoid using unnecessary graphics (figures, tables, graphs etc.) unless they serve a specific purpose. Make sure to use captions and to refer to the graphics you include in your written answer. Graphics without any reference or accompanying explanation will be disregarded.
 - **Organization** and **presentation**. Remember that your assignment report is a reflection of your thinking and learning process. Please organize your report in a logical fashion so that your answers could be easily identified. A general format for your presentation should, as a minimum, include the following components: (1) Question number, (2) Your written answer and/or description and discussion of your results, and (3) Visualization of your results, e.g. images, graphs, tables, as necessary.
- b. Please remember that your assignment is a **professional document**, and should therefore be formatted and constructed accordingly. All assignments are to be typed. Hand-written assignments will not be accepted.
- c. Submission of a hardcopy will be made in class; submission of a softcopy will be made through Blackboard.
- d. The electronic submission of your assignment report has to be in **PDF format**.
- e. If more than one file is submitted, you may submit a single **ZIP** file containing all the assignment files.
- f. Each assignment submission should include a cover page with the following information: assignment title, assignment number, student name, and submission date.

- g. Please make sure you have a backup of all the materials you submit.

16. Other useful campus resources:

- a. The writing center: A114 Robinson Hall; (703) 993-1200; <http://writingcenter.gmu.edu>
- b. The University libraries "ask a librarian"; <http://library.gmu.edu/mudge/IM/IMRef.html>
- c. Counseling and Psychological Services (CAPS): (703) 993-2380; <http://caps.gmu.edu>

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported by the instructor.

Note: Recording is permitted only with the prior written consent of the professor or if recording is part of an approved accommodation plan.