ITMD 537 SYLLABUS

ITMD 537 Data Science Practicum

Hours: 3 credit hours / 45 contact hours

Instructor: Yong Zheng, Ph.D.

Textbook, title, author, and year:
Online material as assigned by instructor

Specific course information

a. **Catalog description:** In this project-oriented course, students will work in small groups to solve real-world data analysis problems and communicate their results. Innovation, soundness of solutions and evaluations, and clarity of presentation will be key elements of evaluation. The topic of the projects may come from university research faculty or from industry partners.
b. **Prerequisites:** ITMD 514, ITMD 522

Specific goals for the course

a. **Course Outcome:** The goal of this project-based course is for students to learn how to apply data science skills and techniques to real-world problems and to interpret and communicate their results. Students will work in groups of three or four to solve real-world data analysis problems or other industry data analytics challenges. Projects topic may come from university research faculty or from industry partners. To keep the scope of the course manageable and to facilitate teamwork, the course will be limited to 24 students.
b. **Course Student Outcomes:**
Upon successful completion of the course the student should be able to do the following:
   - Prepare a proposal to solve a problem using techniques of data science.
     - Explain the problem and it's importance.
     - Explain the methods proposed to solve the problem.
   - Prepare a detailed project plan to solve a problem using techniques of data science, based on a previously developed proposal.
   - Complete a data survey including any issues of inconsistency or incompleteness.
   - Create a problem solution based on a comprehensive examination and analysis of data relevant to the problem at issue.
   - Draft a complete project report, detailing analytic methods that were applied and their results, together with an interpretation of the results and their implications for the project sponsor.
   - Present the results of a project in data science, explained in terms that that a layman can understand.
   - Work with, lead, and manage teams in an enterprise environment to collaboratively arrive at optimal technology solutions.

Topics to be covered

There are no formal lecture-style classes. The course consists of hands-on lab exercises, group discussions and presentations. Students will learn the potential topics for research projects in the 1st week. Student groups will be formed in the 2nd week, followed by group proposals, literature reviews, group practice and discussions, supervision by the instructor, and bi-weekly group presentations in the following weeks. Specific deliverables during the course include:

a. **Project Proposal:** This includes both a written proposal and a short oral presentation, explaining the problem and its importance, the methods the team proposes to apply to the problem, and what new understanding is to be expected.
b. **Project Plan:** This is a detailed plan and schedule of the tasks that the team will perform to successfully complete the project.
c. **Data Survey:** This is a short document discussing the state of the data supplied for the task, including any issues of inconsistency or incompleteness and how they will be addressed in the project, as well as a preliminary exploratory analysis of the structure of the data.
d. **Project Report:** This written report details the analytic methods that were applied and their results, together with an interpretation of the results and their implications for the project sponsor.
e. **Project Presentation:** Teams will also be required to orally present their analyses, and explain them in terms that a layman can understand.