

CMSI 499-03

INDEPENDENT STUDIES: BIOINFORMATICS PRACTICUM

<http://myweb.lmu.edu/dondi/fall2010/cmsi499>

Fall 2010 — Doolan 106

Variable sessions and meetings, 3 semester hours

Office Hours: TR 9am–12nn, or by appointment

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Objectives and Outcomes

To embark on a self-directed course of study in a specific area of computer science, under the guidance of the instructor. The student selects the topic and assists in identifying source material. In addition to learning more about the specific topic, the student will learn how to organize, execute, and document an intensive, individualized semester of self-study. Additional objectives depend on the selected subject matter.

Course Requirements

For individual studies in a bioinformatics practicum project, the student must have proficiency with the Java programming language and associated development tools, some familiarity with relational database management systems, experience with the XMLPipeDB project software suite, and sufficient domain knowledge, especially in the realm of biological databases.

Materials and Texts

Mostly to be identified and reported by the student. Primary leads, for this particular project, include any resources or documents available for the XMLPipeDB, UniProt, Gene Ontology, and PostgreSQL projects, as well as the Microsoft JDBC/ODBC bridge for Microsoft Access database files.

Course Work and Grading

Graded coursework consists of 1 online study journal (20%), 1 final study report (40%), and modifications or extensions to the XMLPipeDB open source code base (40%). Letter grades are determined as follows: $\geq 90\%$ gets an A– or better; $\geq 80\%$ gets a B– or better; $\geq 70\%$ gets a C– or better. I may curve grades upward based on qualitative considerations such as degree of difficulty, effort, class participation, time constraints, and overall attitude throughout the course. Grades are never curved downward.

Work/Study Journal

You will maintain an online work/study journal of your progress in the XMLPipeDB public wiki:

<http://sourceforge.net/apps/mediawiki/xmlpipedb>

This site should contain as complete a record as possible of your tasks, methods, and results throughout the semester.

Your study journal will be graded according to the same criteria as the final paper (see below). The frequency and number of journal entries affects the content and organization components of the study journal's grade.

The study journal will be graded at the end of finals week, December 17. You are, of course, free to maintain the journal beyond the semester — the spirit of this course is, after all, to give you an opportunity to get official credit for something that you would want to study on your own anyway. Continuing the journal provides you with a framework for pursuing this study beyond the semester.

Final Study Report

You will formally document the overall result of your studies in the form of a final report to be submitted at the end of the semester. The report shall consist of at least the following sections:

1. An introduction that states the background and motivation for this course of study,
2. A literature review describing the source materials studied,
3. A summary or survey of what was learned during the semester, and
4. Any commentary that you would like to make about your study journal web site, in terms of its design, functionality, and relationship to the selected topic.

This report should occupy its own, clearly-identified page on the XMLPipeDB public wiki. There are no hard limits on length, but 10–20 pages at the wiki's default print styles, not including

the list of references cited, is typical. The report will be evaluated along the following criteria:

1. *Content (40%)*: What is the quality of the work? Are the background and motivation relevant and well-stated? Is the literature review thorough and well-described? Is the summary or survey complete and substantive? How well-documented is the programming project?
2. *Organization (30%)*: Is the text structured well? Are its ideas and flow easy to follow? Are distinct sections or topics clearly identified?
3. *Writing (20%)*: Are statements clear and easy to follow? Is the language precise and grammatically correct? Is the paper's tone appropriate?
4. *Polish (10%)*: Is the content properly proofread? Are there any misspellings, typos, or other formatting faux pas?

The final study report is due at the end of finals week, December 17.

Open Source Contributions

You will apply what you learn in the form of modifications or extensions to the XMLPipeDB code base. This work will be graded along these criteria:

1. *Design (30%)*: Clarity, flexibility, and ease of maintenance; elegance and innovation; applies proper separation of concerns; satisfies the "one change, one place" property
2. *Functionality (30%)*: Works as intended; produces correct answers/results; performs in a reasonable amount of time; includes tests that demonstrate correct behavior
3. *Naming (20%)*: Clarity and consistency; names correspond to roles, types, or actions
4. *Documentation (15%)*: Presence of README or overview material; abundance of comments in code; genuinely useful information
5. *Version control (5%)*: Sufficient frequency; informative commit log

The state of any code at the end of finals week, December 17, will serve as the basis for this grade.

Version Control

Version control is an indispensable part of today's computer science landscape in industry, the academe, and the open source community. Take full advantage of the functionality afforded by the Subversion repository that is provided by the XMLPipeDB SourceForge project site.

Attendance

Meeting and session schedules are determined individually, and may vary according to the specific subject matter and/or course work. The last day to add or drop a class without a grade of W is September 3. The withdrawal or credit/no-credit deadline is November 5.

University Policy on Academic Honesty

Loyola Marymount University expects high standards of honesty and integrity from all members of its community. All students are expected to follow the LMU honor code, as stated in the *LMU Undergraduate Bulletin 2010-2011*.

Americans with Disabilities Act

Students with special needs as addressed by the Americans with Disabilities Act who need reasonable modifications, special assistance, or accommodations in this course should promptly direct their request to the Disability Support Services (DSS) Office. Any student who currently has a documented disability (physical, learning, or psychological) needing academic accommodations should contact DSS (Daum Hall, Room 224, x84535) as early in the semester as possible. All discussions will remain confidential. Please visit <http://www.lmu.edu/dss> for additional information.

Topics and Important Dates

Dependent on the specific subject matter and on-going progress.