

ISC 4943: Practicum in Computational Science

In the Practicum course, students are expected to show their abilities and knowledge by working on an ambitious project in computational science, with the results presented as a formal written report, and an oral presentation.

The Practicum is a course that is required for graduation in the department. It is normally taken in the spring semester of the senior year.

For this course, the instructor of record plays a supervisory role. The student should meet with the instructor to discuss the purpose of the Practicum, and to consider appropriate faculty mentors. Once a mentor has been chosen, the instructor should ensure that the Practicum timeline is followed, and should receive copies of the proposal, drafts, and final report from the mentor.

The mentor's responsibility is to provide guidance for the student in choosing a project, helping to develop a solution strategy, and reviewing and grading the written work of the student in order to ensure that professional writing standards are achieved. Together, the student and mentor agree on a suitable project, a series of intermediate goals, and a timeline. The student is responsible for writing this proposal up as a formal document. Thereafter, the student works independently except for regularly scheduled meetings with the mentor. At these meetings, the mentor will help the student with difficulties arising in the project. Over the period of the course, the student will submit two drafts and then a final report, which the mentor will review, edit, and return to the student for revision.

Completing the Practicum requires writing the project proposal, carrying out the proposed project work, submitting the two drafts and final report, and making a final oral presentation.

This course maybe repeated to a maximum of six semester hours, with a maximum of only three semester hours credit allowed to be applied to the Computational Science degree.

Prerequisites: Senior standing (> 90 credit hours)

Lectures: Tuesday, 12:30pm-1:45pm, 416 DSL

Instructor: Dr. Tomasz Plewa
Office: 415 Dirac Science Library
Phone: (850) 644-1959
E-mail: tplewa@fsu.edu

Mentor: Chosen by the student

Textbooks:

Although no book is formally required for this course, students will be offered a few selected essays and articles discussing methodology of science.

Website:
<https://fsu.instructure.com/courses/30017>

Credit: 3 semester hours

Course Objectives

At the end of the course, the student will be able to:

- create and adhere to a research proposal and its timelines;
- carry out a substantial project in computational science;
- write and repeatedly revise a project report so that it adheres to professional standards in format and content;
- make an oral presentation of results similar to a short conference talk.

Upper Division Writing Requirement

Students are required to demonstrate upper-level language skills through multiple assignments. For the purposes of this requirement, upper-division writing is defined as writing that requires time for reflection and revision, includes a clearly defined central idea or thesis, provides adequate support for that idea, uses clear and logical organization, adheres to the conventions of standard written language, and is formatted or presented in an appropriate way to the discipline within which it is being taught.

In fulfillment of the Upper Division Writing requirement, the student will demonstrate the ability to:

- communicate using college level writing in the major;
- convey ideas in clear, coherent, grammatically correct prose adapted to their particular purpose, occasion, and audience;
- demonstrate the ways in which writing is a process involving practice, revision, and editing.

Grading

The course grade will be based on

- Project Proposal - 5%
- Project Work - 50%
- Report Draft 1 - 10% (week 6)
- Report Draft 2 - 10% (week 10)
- Final Report - 15% (week 14)
- Oral Presentation - 10%

Consult the grading rubric appended below regarding expected work quality standards.

The scale for the grades will be A (95-100%), A- (90-94%), B+ (85-89%), B (80-84%), B- (75-79%), C+ (70-74%), C (65-69%), C- (60-64%), D+ (57-59%), D (54-56%), D- (50-53%), and F (<50%).

Written Work

A significant portion of the Practicum involves developing professional writing skills; the proposal, drafts, and final report are thus intended in part as evidence of these skills, and the ability of the student to attain a professional level of writing ability by the end.

The first item, the project proposal, should be between 3 and 5 pages long. It should begin with an overview of the area of study, followed by a statement about the student's proposed project, discussing the computational and scientific aspects of the problem, and the goal of the project. Since this is partly a planning document, there should also be a section which analyzes the project as a sequence of milestones, that is, tasks to be carried out, with an approximate timeline for the completion of each. This project proposal should be submitted to the mentor by the end of the second week of the Practicum for review, and a revised version should be completed within a week thereafter.

The two draft reports should be between 10 and 20 pages long. The main portion of each report should develop, perhaps in greater detail than the initial proposal, the area of study, the student's project, and note the details of the algorithms to be implemented, issues of verification and efficiency, as well as benchmarking on test cases. An auxiliary part of the report should detail the student's progress in completing milestones, and any adjustments to the research plan. These reports should be submitted to the mentor by the sixth and tenth weeks of the semester. The mentor will review the reports and return them to the student for revisions, which should be completed within a week.

The final report is due one week before the last day of classes for the semester. This report should be a self-contained document which does not refer to the previous proposal or drafts. It is expected to be written in a professional style and format. It should provide a clearly written introduction to the area of scientific computing in which the student's work will be carried out, describe the kind of problems that are to be handled, lay out the student's thesis which indicates how these problems are to be solved or handled, analyze the solution procedure in terms of algorithms, discuss the issues involved in implementing the solution procedure in a given computer language, present a set of test cases which can be used to verify the solution procedure, show by plots, tables or other means the results of numerical experiments with the test cases, present some concluding remarks which draw conclusions from the results, followed by a bibliography of works cited during the project.

Homework Submission

Project proposals and reports should be submitted to the mentor with a copy to the Instructor (tplewa@fsu.edu).

University Attendance Policy

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to ". . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://dof.fsu.edu/honorpolicy.htm>.)

Americans with Disabilities Act

Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the: Student Disability Resource Center

874 Traditions Way 108

Student Services Building

Florida State University

Tallahassee, FL 32306-4167

(850) 644-9566 (voice) (850) 644-8504 (TDD)

sdrc@admin.fsu.edu

<http://www.disabilitycenter.fsu.edu/>

Free Tutoring from FSU

For tutoring and writing help in any course at Florida State University, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of tutoring options - see <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu for more information. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

Grading standards for ISC 4943: Practicum in Computational Science

Upper Division Technical Writing Requirement

Criteria	A range	B range	C range	D range	F range
Thesis/main message	Interesting, memorable, exceptionally original thesis/main message	Clear thesis, main message; reader never has to read any paragraphs twice	There is a thesis, but it is vague, too general, or says little	There is no thesis, or it is unclear or confusing	There is no thesis, or it is very unclear
Organization	Extremely well organized, logical; easy to follow	Well organized, easy to follow; 1-2 sentences may fall short	Mostly organized, but some points are hard to follow or out of place	Poorly organized, hard to follow; possibly, confusing	Very disorganized, hard to follow; faulty logic or parts missing
Quality of evidence	Evidence is highly credible and used logically	Evidence is highly credible and used logically but may fall short in 1-2 ways	Evidence is not as credible as an A or B paper or may not be used as logically; author offers opinions with little evidence.	Evidence is lacking, of poor quality, or not used well; author supplies opinions instead.	There is little evidence tied to the thesis
Paragraph skills	Well developed & organized around one main idea, ideally with a topic sentence; sentences follow logically, and signal/transition phrases are used	Paragraphs may not be as smooth as the A paper but are generally well organized and developed.	Paragraphs may lack a topic sentence and smooth transitions between sentences	In many cases, paragraphs are poorly structured and arranged.	Paragraph skills are severely lacking or nonexistent
Sentence skills	Sentences are elegant and grammatically perfect	No grammar mistakes; healthy variety of length and structure of sentences	Not much variety in structure or length; a few grammar mistakes	Poorly constructed sentences, many grammar mistakes	Major problems
Grammar/mechanics	Perfect or nearly so	Only a few problems noticeable.	Some problems appear repeatedly.	Many grammar mistakes	Very poor
Audience & tone	Shows awareness of audience's needs & values; tone is perfect	May fall short in 1 or 2 minor ways	Shows some lack of awareness or audience; tone may be off the mark somewhat	Not much regard for audience at all; tone may be off the mark	No sense or audience; author seems tone deaf
Documentation	Sources are used ethically and cited perfectly	Falls short in 1 small way	Falls short in 2-3 small ways	Sources are improperly cited	Major problems with citation of sources
Meets requirements of assignment	Meets all requirements	Falls short in 1-2 ways	Falls short 3-4 ways	Falls short in more than 4 ways	Pays little attention to requirements
On time	On time	One day late.	Three days late.	A week late.	1 week + late.