

1 credit

Bulletin Description: This is the first course of the capstone experience in physics. It results in the proposal of an undergraduate research project that is carried out in the second capstone course. **Prerequisites:** consent of instructor.

Credits: Senior Project I yields 1 credit.

Instructor: Andrei Kryjevski, South Engineering 318D, andrei.kryjevski@ndsu.edu,
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Office hours: by arrangement

Course objectives: Synthesize and apply conceptual understanding and practical knowledge gained from coursework to produce a proposal for a semester-long undergraduate research project in physics. The proposed research must be feasible to be carried out by an undergraduate student and must make an original intellectual or creative contribution to the discipline of physics. Physics majors are required to complete Senior Project I and Senior Project II in their final year. Senior Project I precedes Senior Project II. In exceptional cases, which must be approved by the Capstone Committee, both courses can be taken simultaneously. Senior Project I requires students to identify a project and develop a proposal that is feasible to be carried out in Senior Project II, submit the proposal to the Capstone Committee, and obtain approval of the project.

Projects: Projects should consist of a methodical investigation to establish new knowledge in physics, for example, by proving (or disproving) a scientific hypothesis or by providing an answer to a specific question. *The research must be original but does not have to be publishable.* Core parts of the research, such as experiments, computer simulations, or derivations should not be outsourced but must be conducted by the student. Ineligible projects include, but are not restricted to: literature reviews, solely reproducing previously published results.

Finding a supervisor: A supervisor must be a tenured or tenure-track faculty member in the NDSU Department of Physics. *Exceptions require approval by the capstone committee.* In some cases students will have discussed research interests and potential projects with faculty members well before their Senior year. If this is not the case, students are expected to set up multiple meetings with several potential faculty supervisors and engage in detailed discussions before a project is chosen.

Required student resources: To be determined by the student's supervisor.

Course Schedule: There are no formal class meetings, except for the organizational meetings in the first two weeks of the semester. But the students are required to meet with the Capstone Committee regularly to report progress. No later than the *end of the ninth week* students must submit to the Capstone Committee a proposal (2-3 pages total), including (1) the name of the faculty supervisor, (2) a tentative title, and (3) a project description, including motivation, objectives, methods, and a plan/timeline. All proposals will undergo review, resulting in approval or revision requests. A passing grade requires project approval by the Capstone Committee prior to the end of the semester.

Students who receive approval prior to the semester end are strongly encouraged to start working on their research project.

Evaluation/ Grading: Grading decisions are made by the Capstone Committee. Grading is pass/fail. A project proposal approved by the Capstone Committee is required for a passing grade.

Attendance Statement: According to NDSU Policy 333 (www.ndsu.edu/fileadmin/policy/333.pdf), attendance in classes is expected.

Additional Statements: *1. Veterans and student service members with special circumstances or who are activated are encouraged to notify the instructor as soon as possible and are encouraged to provide Activation Orders. 2. Any students with disabilities or other special needs, who need special accommodations in this course are invited to share these concerns or requests with the instructor and contact the Disability Services Office as soon as possible (ndsu.edu/disabilityservices). 3. The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academic honesty.*