Oceanography 340A and 340B
Intermediate Python Bootcamp
340A SLN 22081 (1 Credit), 340B SLN 22082 (2 Credits)
Winter Quarter, 2019

This course is designed to help students take their computational ability to the next level, allowing them to conduct advanced scientific research. Students will learn how to work with large sets of oceanographic data and break it down into its core components, enabling deep understanding of the data's structure. With this knowledge, calculations can be made on the data in an effort to research the data and extract meaning from it.

The data we will work with in this class will come from various fields of oceanography. We will work with .netcdf, .cnv, .csv, and possibly other file types. All computation will be done in Python (3.5 or 3.7). Python packages utilized will include *numpy, scipy, matplotlib, seawater, cartopy, seabird, netCDF4, xarray, pandas*, and more.

Overall Learning Goal: Equip students with the ability to conduct sophisticated oceanographic research using Python. This includes reading and writing to files of various types, working with data structures and abstract data types, and creating complex figures based on calculations made with packaged algorithms. By the end of the course, students will be able to more easily work with scientific data, manipulate it in ways helpful for conducting oceanographic research, and be confident in their ability to use Python and some of its core packages, mentioned above.

Instructor:

Prof. Susan Hautala
Note: you may call me by my first name if you are comfortable doing so -- Oceanography is informal and this class is small!
Office: 315 Ocean Sciences (OSB)
Email: Canvas Inbox

Teaching Assistant:

Patrick Old
Email: patold@uw.edu or Canvas Inbox

Class Time: Monday (A) and Friday (B) 10:30AM-12:20PM
Location: OTB 051
There is no final exam and no class will be held during finals week.

Open Coding Studio: Wednesday 10:30 – 12:20, also in OTB 051
Students are highly encouraged to attend the open studio sessions, as they will serve as a great resource for clearing up confusion on assignments and be an excellent time to collaborate with your TA, instructors, and fellow students. Additional appointments are available during the week if needed – please contact us via email or Canvas to set these up.

Note: Dr. Mikelle Nuwer and Dr. Miles Logsdon will be participating in class as faculty observers. You are welcome to chat with them in class, but contact Susan or Patrick for extra help and or logistics questions.

Course Websites:
OCEAN 340A: https://canvas.uw.edu/courses/1270526
OCEAN 340B: https://canvas.uw.edu/courses/1270532

Evaluation 340A:

Weekly Homework Assignments	90%
Participation	10%

Evaluation 340B:

Weekly Additional Homework	50%
Final Project	40%
(Checkpoints 15% and Final Submission 25%)	
Participation	10%

This course is NOT graded on a curve. The following table may be used to calculate a GPA from a class percentage. Percentages will be rounded to the nearest percentage point (ex. 96.6% = 97% = 4.0 GPA).

%	GPA	%	GPA	%	GPA	%	GPA
100-97	4.0	83-82	3.1	69	2.2	54-53	1.3
96-95	3.9	81	3.0	68-67	2.1	52-51	1.2
94-93	3.8	80	2.9	66-65	2.0	50	1.1
92	3.7	79	2.8	64-63	1.9	49-48	1.0
91	3.6	78-77	2.7	62-61	1.8	47-46	0.9
90	3.5	76-75	2.6	60	1.7	45-44	0.8
89-88	3.4	74-73	2.5	59	1.6	43-41	0.7
87-86	3.3	72-71	2.4	58-57	1.5	< 40	0.0
85-84	3.2	70	2.3	56-55	1.4		

Text: There is no textbook for this course. However, some free online tutorials may be utilized. Links to these will be sent out to students as necessary.

Technology: Bring a laptop to class each day, as it is needed to complete the problem sets and collaborate with others effectively. Free software will need to be installed on your machine. The Student Technology Loan Program (https://stlp.uw.edu) allows students to borrow laptops on a first-come, first-serve basis.

Discussions: Discussion sections will occur on Mondays for 340A and Friday for 340B from 10:30 AM – 12:20 PM. Regular class attendance is highly encouraged and will help students learn and retain course material (and receive higher grades). The purpose of discussion sections is to collaborate with students and instructors to better understand the material. They will consist of a brief talk by an instructor at the beginning of the period and will be followed with collaboration between instructors and students in an effort to complete an assignment.

Participation: Participation is a key component of both OCEAN 340A and OCEAN 340B. Coming to class and being actively involved in discussions is the best way to get the most out of these courses. Because of this, attendance will be taken each class period, and we will be evaluating how involved students are in discussions (asking questions, clarifications, affirmation of ideas, etc.). It will not be challenging to receive full credit for participation as long as an attempt to participate is made, and you are engaged in listening when not speaking, and in working in class to complete assignments. Please inform an instructor if an excused absence occurs, and it will be handled according to university policy.

Problem Sets: Problem sets will be given out on Mondays (A) and Fridays (B) and will be due on Thursdays at 11:59 PM unless otherwise stated. Problem sets will be posted to the "Assignments" tabs on the Canvas course site by 5 PM each day after class. Solutions to each problem set must be submitted via Canvas. Late submissions are accepted but there is a penalty of 20% per day the assignment is late. However, the maximum penalty that can occur for an assignment is 60% (which is reached in three days after the assignment is due), meaning students may submit work at any time in the quarter for up to 40% credit. These problem sets are to be completed independently, though you may borrow and discuss ideas with fellow students and instructors. You may NOT copy significant amounts of code from others. If you are unsure about what to count as significant, please ask an instructor.

Final Project: There is no final project for OCEAN 340A. OCEAN 340B will have a final project that will consist of the utilizing Python to write a complete script to analyze an oceanographic data set, conduct oceanographic calculations upon the data, and display the findings of this script on a webpage.

There will be checkpoints along the way, which will be put in place to make sure that the student is keeping up throughout the quarter on accomplishing what will be needed to submit a final project at the end of the course. There will be three checkpoints, comprising a total of 15% of the final grade for the course. At the end of the quarter, the students will submit their final projects. That submission will have a rubric that will be released to students a few weeks before the quarter ends. This submission will account for 25% of the final grade for the course.

Extensions: Two extensions of two days will be granted to both OCEAN 340A & 340B, meaning a total of four extensions can be used (though they are note transferrable between sections). To use an extension, you must message Patrick Old on Canvas or via email (patold@uw.edu) at least 24 hours in advance of the assignment due date. If you message him less than 24 hours of before the due date, no extension will be granted. Assignments turned in after an extension due date will count as being late.

Re-grades: If you feel that an assignment has been graded unfairly or that a mistake has been made, you may submit a re-grade request within one week of being handed back the assignment. Requests must be submitted to Patrick Old via email (patold@uw.edu) and must indicate specifically what part of the assignment should be regraded.

Academic Accommodations: It is crucial that all students in this class have access to the full range of learning experiences. At the University of Washington, it is the policy and practice to create inclusive and accessible learning environments consistent with federal and state law. Full participation in this course requires the following types of engagement:

The ability to attend two weekly one hour and fifty minute discussion sections with 5-10 other students. The ability to collaborate with students and instructors. Complete computer programming assignments and submit the written code via Canvas.
If you anticipate or experience barriers to your learning or full participation in this course based on a physical, learning, or mental health disability, please immediately contact an instructor to discuss possible accommodation(s). A more complete description of the disability policy of the College of the Environment can be found here. If you have, or think you have, a temporary or permanent disability that impacts your participation in any course, please also contact Disability Resources for Students (DRS) at:
206-543-8924 V / 206-543-8925 TDD / uwdss@uw.edu e-mail/ http://www.uw.edu/students/drs.

Students must inform the instructor no later than the first week of the quarter of any accommodation(s) you will or may potentially require. Instructor and TAs will maintain strict confidentiality of any student's disability and accommodation(s); help all students meet the learning objectives of this course.

Academic Honesty: At the University level, you must do your own scholarly work. Presenting anyone else's scholarly work (which can include written material, graphics or other images, and even ideas) as your own, without proper attribution, is considered academic misconduct. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect that you will know and follow the university's policies on cheating and plagiarism. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the College of the Environment Academic Misconduct Policy and the University of Washington Community Standards and Student Conduct website.

You will work independently on assignments. If we determine that you have cheated on an assignment, you will be given a warning. If we determine that you have cheated a second time on an assignment we will report you to the Dean of the College of the Environment and the Vice Provost for Student Life. The student accused of cheating has the right to appeal to the Dean's representative. We expect all students to maintain the highest standards of academic conduct.

Course Expectations:
The following expectations will guide our work together.

Instructor Expectation of Students
Our expectations are that you will

- Come to discussions on time, engage in the course content for the full class time, and refrain from any activities that distract from a positive learning environment;
- Come to discussions prepared to participate;

- Participate in class activities in ways that support course goals and demonstrate respect and civility towards all members of the teaching/learning team and classmates;
- Take an active role in obtaining information and resources for completion of tasks and assignments in the course and, ultimately, in promoting your own learning;
- Monitor your own learning and contribute feedback to support other members of the teaching/learning team in achieving course goals;
- Maintain the highest standards of academic conduct.

Students' Expectations of Instructors

You can expect that we will

- Begin and end class on time;
- Come to class prepared;
- Provide information and resources to support learning;
- Make the best possible use of class time to support learning;
- Answer questions promptly and sufficiently;
- Be available to provide additional assistance when needed;
- Provide clear and consistent criteria that can be used fairly in evaluating your learning;
- Welcome input on ways to support you in your achievement of course goals.

SCHEDULE

A = OCEAN 340A Problem Set
B = OCEAN 340B Problem Set
B-FP = OCEAN 340B Final Project Assignment

DATE	TOPIC/ASSIGNMENT
WEEK 1 **January 7-11**	**CANOPY & VISUAL STUDIO SETUP, PYTHON REFRESHER** HW #1A AND #1B ASSIGNED HW #1A DUE (1/10)
WEEK 2 **January 14-18**	**FUNCTIONS & PACKAGES, PYTHONIC STYLE & TECHNIQUES** HW #2A & #2B ASSIGNED HW #2A & #1B DUE (1/17)
WEEK 3 **January 21-25** ***No class January 21***	**WEBSITE DEPLOYMENT** A: WEEK 3 QUIZ (PARTICIPATION) #1B-FP ASSIGNED (CHECKPOINT #1) PARTICIPATION QUIZ & HW #2B DUE (1/24)
WEEK 4 **January 28- February 1**	**OCEANOGRAPHIC FILE TYPES #1: CNV** HW #3A & #3B & #2B-FP ASSIGNED (CHECKPOINT #2) HW #3A & #1B-FP DUE (1/31)
WEEK 5 **February 4-8** ***No class February 4***	**OCEANOGRAPHIC FILE TYPES #2: NETCDF** HW #4B ASSIGNED HW #3B & #2B-FP DUE (2/7)
WEEK 6 **February 11-15** ***No class February 11***	**WRITING NETCDF FILES & ADVANCED PLOTTING #1** HW #4A & #5B ASSIGNED HW #4A & #4B DUE (2/14)
WEEK 7 **February 18-22** ***No class February 18***	**ADVANCED PLOTTING #2** HW #6B ASSIGNED HW #5B DUE (2/21)
WEEK 8 **February 25-March 1**	**FINAL PROJECT ANALYSIS WEEK #1** #3B-FP ASSIGNED (FINAL PROJECT CHECKPOINT #3) HW #5A ASSIGNED HW #5A & #6B DUE (2/28)
WEEK 9 **March 4-8**	**FINAL PROJECT ANALYSIS WEEK #2** #3B-FP DUE (3/3)
WEEK 10 **March 11-15**	**WEB PROGRAMMING, FINAL PROJECT WEBPAGE** FINAL PROJECT ANALYSIS SHOULD BE COMPLETE (3/10) WEB PROGRAMMING BASICS: HTML, CSS & JS DISPLAY FINAL PROJECT ONLINE
FINALS WEEK ***NO CLASS**	**B-FP: FINAL PROJECT DUE 3/17 @ 11:59 PM**