

FORMAT 1

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500).
See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	GPMSL	College/School	SFOS
Prepared by	Seth L. Danielson	Phone	907 474 7834
Email Contact	sldanielson@alaska.edu clneumann@alaska.edu	Faculty Contact	Seth Danielson

1. ACTION DESIRED
(CHECK ONE):

Trial Course	<input checked="" type="checkbox"/>	New Course	<input type="checkbox"/>
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2. COURSE IDENTIFICATION:

Dept	<input type="text" value="MSL"/>	Course #	<input type="text" value="494"/>	No. of Credits	<input type="text" value="3"/>
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Justify upper/lower division status & number of credits:

This is a 400-level course intended for upper class undergraduate and graduate students seeking to gain computer programming skills with a practical approach to data analysis and visualization. There will be 3 hours of lecture per week and grades will be based on homeworks, tests, class participation, and a final project.

3. PROPOSED COURSE TITLE:

4. To be CROSS LISTED? If yes, Dept: Course #

YES/NO

NOTE: Cross-listing requires approval of both departments and deans involved. Add lines at end of form for additional required signatures.

5. To be STACKED? If yes, Dept: Course #

YES/NO

How will the two course levels differ from each other? How will each be taught at the appropriate level?:

Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online – see URL at top of this page.

6. FREQUENCY OF OFFERING:

Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING
(AY2013-14 if approved by 3/1/2013; otherwise AY2014-15)

Spring AY2014-15

8. COURSE FORMAT:

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, **any core course compressed to less than six weeks must be approved by the Core Review Committee.**

COURSE FORMAT: (check all that apply)

<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input checked="" type="checkbox"/>	6 weeks to full semester
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OTHER FORMAT (specify)

Mode of delivery (specify lecture, field trips, labs, etc)

Lecture

9. CONTACT HOURS PER WEEK:

LECTURE hours/weeks LAB hours /week PRACTICUM hours /week

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-computing-/> for more information on number of credits.

OTHER HOURS (specify type)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a complete description:

FISH F487 W, O Fisheries Management
3 Credits Offered Spring

Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. *Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of Instructor.* Cross-listed with NRM F487. (3+0)

MSL S494 Computer programming for scientific applications
3 Credits Offered Spring Odd-Numbered Years
Introduction to scientific programming techniques and applications. This MATLAB-based course will cover programming fundamentals, input/output operations, and mapping and other data visualization techniques. Students will work with NetCDF and OpenDAP protocols and remote large-volume data repositories. No prior programming experience required. *Prerequisites: Senior or graduate level standing.*

11. COURSE CLASSIFICATIONS: Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

H = Humanities S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? If YES, attach form.

YES:	<input type="text"/>	NO:	<input checked="" type="checkbox"/>
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IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, **Format 6** W = Writing Intensive, **Format 7** X = Baccalaureate Core

11.A Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.

YES NO

12. COURSE REPEATABILITY:

Is this course repeatable for credit? YES NO

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit?

<input type="text"/>	TIMES
<input type="text"/>	CREDITS

If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?

<input type="text"/>	CREDITS
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13. GRADING SYSTEM: Specify only one. Note: Changing the grading system for a course later on constitutes a Major Course Change – Format 2 form.

LETTER: PASS/FAIL:

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES

Senior or graduate standing.

These will be *required* before the student is allowed to enroll in the course.

15. SPECIAL RESTRICTIONS, CONDITIONS

None.

16. PROPOSED COURSE FEES

\$0

Has a memo been submitted through your dean to the Provost for fee approval?
Yes/No

17. PREVIOUS HISTORY

Has the course been offered as special topics or trial course previously?
Yes/No No

If yes, give semester, year, course #, etc.:

18. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

This course will require a Research Faculty member to be paid for instruction. The SFOS Dean has approved inclusion of this course on Danielson's 2014-2015 Workload. With sufficient enrollment the course has the potential to be revenue neutral or even revenue positive for SFOS and UAF. An informal poll of SFOS students was well received – I had over twenty current students and state agency personnel contact me to express their interest in such a course. Students need access to a computer with MATLAB, which can be their own computer with a student-license, a computer provided by the lab (if a graduate student), or one of the SFOS general use computers. There are four computers in the SFOS undergraduate lounge, four in the SFOS Arctic Health lab and three in the O'Neill oceanography commons. If SFOS/GPMSL wants to offer this course in a distance delivery videoconference mode (preferred by instructor) then a classroom with videoconference capabilities will be required.

19. LIBRARY COLLECTIONS

Have you contacted the library collection development officer (kjensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No Yes X
Contacted and resolved 3 September 2014. There are 449 titles returned in a search for "MALAB" on the UAF library website and 95 titles found for the "Introduction MATLAB" search. A survey of the titles shows that there are many appropriate reference books (many online) available at the library for this course's students.

20. IMPACTS ON PROGRAMS/DEPTS

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

There are other introductory programming courses available on campus but they are not tailored to the needs of SFOS students. In particular, the Introduction to Computational Meteorology (ATMF621) and the Computer Programming and Automation for Geosciences (GEOS F436/F636) courses have a focus on physical science applications. While these courses may cover many of the same topics as the proposed course, the atmospheric and geophysical science emphasis of these is a turn-off to fisheries and marine biology students and as a result very few SFOS students take these classes. By offering this course within SFOS we can make sure that the applications and examples utilized are relevant to the SFOS student needs. This course has been discussed with the GPMSL head and the SFOS Dean. This course will have a positive impact for SFOS students in GPMSL and FISH.

21. POSITIVE AND NEGATIVE IMPACTS

Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.

Positive impacts: We will provide graduate and possibly upper class undergraduate students an opportunity to become fluent in computer techniques that are necessary for modern inter-disciplinary analyses and graphical visualizations. For example, a marine biology student may need to interpret inter-annual changes in specie composition with respect to changes in the local environment. Without the ability to download and work with satellite ice concentration data or numerical model output showing the strength and direction of ocean currents, these students lack the ability to utilize the vast store of resources that are available to guide their analyses. Generation of base maps, plotting data on maps, and constructing loops to automate repetitive operations will all covered. Such tools will better prepare our students for assembling their theses, dissertations, research presentations, and industry or agency jobs after achieving their degrees.

This course has the potential to bolster the toolkit of students that will take MSL 632 (Oceanographic Data Analysis and Visualization) and MSL620 (Physical Oceanography). MSL620 is a core course for oceanography students. MSL 620 lab assignments requires some proficiency with MATLAB. Conversation with the MSL 620 and 632 instructors indicates that students in these courses are often inadequately prepared and would benefit from a more fully developed programming background. The proposed course will prepare students for MSL 620 and 632, allowing these other classes to better cover the intended material.

Negative impacts: No anticipated negative impacts. This course has a potential to draw students away from ATM F621 and/or GEOS F436/F636, but we believe that in practice this impact will be negligible because few if any SFOS students take these other courses each year and the GI/CNSM students currently taking these courses are well served by their existing meteorological/geophysical emphases.

JUSTIFICATION FOR ACTION REQUESTED

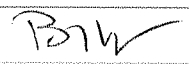
The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

Today's fisheries, marine biology, and oceanography students increasingly need to tap into datasets derived from disciplines that lie beyond their focal area of study. These datasets are often too large and unwieldy to handle within a consumer spreadsheet (e.g. Microsoft Excel) and are often stored in special binary formats that cannot be read by a spreadsheet. Such large-volume datasets include those from passive and active acoustic underwater recorders, satellite measurements, and numerical model outputs (both atmosphere and ocean hindcasts and reanalyses). This course will provide students with the foundation that they need to take advantage of these many rich data streams. While learning fundamentals of scientific programming, students will also learn to make publication-quality graphics and maps that depict geospatial data. The interdisciplinary potential of the students' research will expand and their project and thesis analyses will benefit. The skills learned here will better prepare SFOS students for assembling their theses, dissertations, research presentations, and industry or agency jobs after achieving their degrees.

APPROVALS: Add additional signature lines as needed.

 Date 9/3/14
Signature, Chair, Program/Department of: GPHSL

 Date 9/4/14
Signature, Chair, College/School Curriculum Council for: SFOS

 Date 9/4/14
Signature, Dean, College/School of: SFOS

Offerings above the level of approved programs must be approved in advance by the Provost.

Date

Signature of Provost (if above level of approved programs)

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

	Date	
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Signature, Chair

Faculty Senate Review Committee: ___Curriculum Review ___GAAC

___Core Review ___SADAC

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)

	Date	
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Signature, Chair, Program/Department of:

	Date	
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Signature, Chair, College/School Curriculum Council for:

	Date	
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Signature, Dean, College/School of:

ATTACH COMPLETE SYLLABUS (as part of this application). This list is online at:
<http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/uaf-syllabus-requirements/>

The Faculty Senate curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course (or changes to it) may be denied.

SYLLABUS CHECKLIST FOR ALL UAF COURSES

During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

1. Course information:

Title, number, credits, prerequisites, location, meeting time
(make sure that contact hours are in line with credits).

2. Instructor (and if applicable, Teaching Assistant) information:

Name, office location, office hours, telephone, email address.

3. Course readings/materials:

Course textbook title, author, edition/publisher.

Supplementary readings (indicate whether required or recommended) and any supplies required.

4. Course description:

Content of the course and how it fits into the broader curriculum;

Expected proficiencies required to undertake the course, if applicable.

Inclusion of catalog description is *strongly* recommended, and

Description in syllabus must be consistent with catalog course description.

5. Course Goals (general), and (see #6)

6. Student Learning Outcomes (more specific)

7. Instructional methods:

Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

8. Course calendar:

A schedule of class topics and assignments must be included. Be specific so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say "lab". Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

9. Course policies:

Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

10. Evaluation:

Specify how students will be evaluated, what factors will be included, their relative value, and how they will be tabulated into grades (on a curve, absolute scores, etc.) Publicize UAF regulations with regard to the grades of "C" and below as applicable to this course. (Not required in the syllabus, but is a convenient way to publicize this.) Link to PDF summary of grading policy for "C":

http://www.uaf.edu/files/uafgov/Info-to-Publicize-C_Grading-Policy-UPDATED-May-2013.pdf

11. Support Services:

Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

12. Disabilities Services: Note that the phone# and location have been **updated**. <http://www.uaf.edu/disability/> The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials.

State that you will work with the Office of Disabilities Services (208 WHITAKER BLDG, 474-5655) to provide reasonable accommodation to students with disabilities.

MSL S494: Computer Programming for Scientific Applications Class Syllabus

Spring 2015

Instructor: Dr. Seth Danielson

Office: 112 O'Neill

Tel: (474) 7834

email: sldanielson@alaska.edu

Class location: 214 O'Neill

Class times: MWF 11:45-12:45

Office hours: MWF 1-2 pm

3 credits

Course Description:

Catalog Description: MSL S494; Computer programming for scientific applications; 3 Credits Offered Spring Odd-Numbered Years. Introduction to scientific programming techniques and applications. This MATLAB-based course will cover programming fundamentals, input/output operations, and mapping and other data visualization techniques. Students will work with NetCDF and OpenDAP protocols and remote large-volume data repositories. No prior programming experience required. Prerequisites: Senior or graduate level standing.

This course provides a practical introduction to scientific computer programming techniques and applications. It is intended for students with little or no prior computer programming experience but who have a need to manipulate and graphically depict large volume datasets that fall beyond the capability of typical spreadsheet operations. We will cover programming fundamentals, file input/output operations, working with large-volume data repositories (such as oceanographic or atmospheric reanalysis numerical model output files) and data visualization techniques. Although we will base the instruction and homeworks on the MATLAB programming language, the techniques learned here can be applied to many other platforms.

Today's fisheries, marine biology, and oceanography students increasingly need to tap into datasets derived from disciplines that lie beyond their focal area of study. These datasets are often too large and unwieldy to handle within a consumer spreadsheet application (e.g. Microsoft Excel) and are often stored in special binary formats that cannot be read by a spreadsheet. Such large-volume datasets include those from passive and active acoustic underwater recorders, satellite measurements, and numerical model outputs (both atmosphere and ocean hindcasts and reanalyses). This course will provide students with the foundation that they need to take advantage of these many rich data streams. While learning fundamentals of scientific programming, students will also learn to make publication-quality graphics and maps that depict geospatial data. The interdisciplinary potential of the students' research will expand and their project and thesis analyses will benefit. The skills learned here will better prepare SFOS students for assembling their theses, dissertations, research presentations, and industry or agency jobs after achieving their degrees.

Course Overall Goal:

Students will gain a fundamental knowledge of computer programming techniques that will

enable them to effectively handle, analyze, and visualize arbitrary data. Students will be well prepared for the programming requirements within MSL 620 Physical Oceanography and MSL F632 Oceanographic Data Analysis and Visualization.

Student Learning Outcomes:

Students who take this class, participate, do the homework, and attend regularly can develop the following skills:

- Understand basic computer programming techniques including loops, conditional statements, sorting, and mathematical operations.
- Understand how to identify and fix programming errors.
- Understand how to read in ASCII and NetCDF data files.
- Understand how to access remote data archives using the OpenDAP interface protocol.
- Understand how to export the results of computations into a formatted ASCII output file.
- Improve student's ability to generate publication-quality data-based graphics.
- Understand how to make a map and plot spatially explicit data on the map.

Instructional methods:

This course is based on lectures, which will cover the major topics, emphasizing and discussing the important points. They are not sessions to regurgitate material already written in the text. Your personal participation is important; asking questions will help you overcome conceptual roadblocks and coding problems. It will help you learn more efficiently if you read the assigned material before lecture. We do have required and recommended textbooks and programming reference books. Readings will be regularly assigned. The course will follow these readings although in class we will emphasize select topics. Material will be conveyed by the assigned readings, standard lecture, in-class discussions, and in-class presentations by students. Weekly homeworks will ensure that students keep up to date with learning the material at hand.

Supplies Needed:

Access to a computer (PC, MAC, UNIX, or Linux) with MATLAB installed (student version available at bookstore) or access to a UAF computer lab that has MATLAB. Note that *one copy of the student version of MATLAB costs \$100* but this copy holds licenses for installation on *two* computers so you can share with a classmate and cut your costs in half if you decide to purchase a copy. Students who do not wish to purchase MATLAB can use computer that has a UAF site license. Within SFOS, there are four computers in the 2nd floor O'Neill undergraduate lab, four computers in the SFOS Arctic Health computer lab and three computers in the 1st floor O'Neill oceanography commons.

Required Text:

Author: Attaway, S.,

Title: MATLAB: A Practical Introduction to Programming and Problem Solving.

Edition/Publisher: Third Edition. Elsevier. San Fransisco.

Recommended supplementary readings: basic texts and references

- The MathWorks. The official website for MATLAB is at <http://www.mathworks.com/>. Various tutorials can be found under Support > MATLAB > Demos and Webinars. User guides can be found under Support > MATLAB > Documentation.

- Hahn B., and D. Valentine, 2013. Essential Matlab for Engineers and Scientists: 5th Edition, Academic Press. Waltham, MA. Available at the UAF Bookstore.
- MATLAB online glossary: http://people.sc.fsu.edu/~jburkardt/html/matlab_glossary.html
- Hart, David and Clinton Wolfe, 1999. "Getting Started with MATLAB," Indiana University, University Information Technology Services, available online at: <http://www.indiana.edu/~statmath/support/bydoc/>.
- Still have a programming problem? Remember that a Google search is your friend.

Course Policies:

Homework:

There will be weekly programming-based homework sets. You are encouraged to work with others on the homework, but please make sure that you understand the problems that you hand in. I will randomly ask students to present the homework on the board and the board presentation of the problems will be a part of your participation grade. You will hand in your homework papers at the beginning of class and we will discuss problems after they have been graded and returned in the following class period.

Complaints and Concerns:

You are always welcome to talk to me to express complaints and concerns about the class.

Evaluation:

The course grade will consist of the following components. Final letter grades will be based on a standard scale: A=90 to 100%, B=80% to 89%, C=70% to 79%, D=50% to 69%, and F≤50%. As of Fall 2006, UAF has instituted a +/- scale to the grades, so the bottom and top 3 percentage points will fall within the '-' and '+' ranges, respectively. For example: 90-92% will be an A-, 93-96% will be an A, and above 97% will be an A+.

Grade component	Fraction of final grade
Attendance	15 %
Participation	15 %
Homework	30 %
Tests	30 %
Final Project	10 %

This course is based on a combination of lectures, homeworks, and a final project. The instructor will evaluate participation and homeworks and assign grades appropriately. You will have one week to complete and return the homework sets to the instructor. *Late problem set grades will be reduced by 10% for each class day they are late.* Attendance will be used for evaluation with two missed classes excused. Evaluation of student participation in classes will be based on your answers to in-class questions regarding material covered in the previous class. There will be no formal exam during the final week. However, there will be three in-class tests (each worth 10% of your final grade) designed to test your comprehension of the subject matter. A missed test will be given a 0 grade but prior arrangement with the instructor can be arranged to reschedule the test at another time.

General Advice: Computer programming is not something one reads and memorizes, rather

it is something you learn how to do through hands-on practice. Attending lectures but not spending time interfacing with the computer will be disastrous for your performance on tests and homeworks. Expect that each piece of code will require multiple attempts to get the syntax right, to correct typing errors, and to get the logical flow correct. *Think of programming as a game in which you are trying to solve a puzzle.*

Try the following study and coding procedures:

- A. Read the assigned material so you get a second description of how to go about programming. Browse through the reading material so that you are familiar with the various tools (commands) that are available to help you solve your problem.
- B. Listen carefully to the lecture and take notes, ask questions and participate. This is a substantial part of your grade and could mean the difference between a letter grade in the end. Pay particular attention to the programming examples given in the lectures.
- C. There is a three-step process in coding. First you must think about an approach to solving the programming “puzzle” at hand. It may be worthwhile to diagram the approach with a flow chart. Second, try writing code that implements the selected approach. Third, debug the program so that it actually works correctly.

Support Services:

The instructor is available for assistance during office hours (112 O’Neill Building, MWF 1-2 pm) or through individually scheduled appointments at other times. UAF Student Support Services Tutoring Center is located in 514 Gruening and is open Sunday-Friday. Walk-in and scheduled tutoring for one-on-one or small group (up to 3 students) is available. Additional information is at <http://www.uaf.edu/sss/tutoring-center/>.

Disabilities Services: The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. We will work with the Office of Disabilities Services (208 WHITAKER BLDG, 474-5655) to provide reasonable accommodation to students with disabilities. If you need assistance with completion of any form, contact UAF Disability Services by email at uaf-disabilityservices@alaska.edu, by phone at (907)474-5655, or by TTY at (907)474-1827.

Academic Conduct:

Plagiarism and cheating are matters of serious concern for students and academic institutions. The UAF Student Code of Conduct defines academic standards expected at the University of Alaska Fairbanks, and these will be followed in this class. The UAF Student Code of Conduct can be found at: <https://www.uaf.edu/catalog/current/academics/regs3.html>.

MSL494 SPRING 2015 CLASS CALENDAR:

- F 1/16:** Class introduction, syllabus; Description of Matlab Environment, Variables, Use of MATLAB help. Basic dos and don'ts. Read Chapter 1 of text.
- M 1/19:** No class (Civil Rights day)
- W 1/21:** HW1 assigned. Relational and logical operators, Conditional statements. Read Ch. 2.
- F 1/23:** Conditional statements continued, useful built-in functions.
- M 1/26:** HW1 due, HW2 assigned. Adopting good programming habits, commenting, and error checking. Read Ch. 3.
- W 1/28:** Review HW1 issues. Creating and manipulating matrices.
- F 1/30:** Matrix math, Matrix functions, colon operator, dot multiplication, cross products.
- M 2/2:** HW2 due, HW3 assigned. 2-D plots: line, scatter, subplots, log-log. Read Ch. 4.
- W 2/4:** Review HW2 issues. Creating publication quality graphics, control of figure characteristics.
- F 2/6:** Saving plots and controlling graphic export characteristics.
- M 2/9:** HW3 due. Loops. Debugging loops. Read Ch. 5.
- W 2/11:** Review HW3 issues. Multiply embedded loops. Review for Test 1.
- F 2/13:** *** TEST #1 ***
- M 2/16:** HW4 assigned. More Advanced uses of matrices: indexing, finding subsets. Read Ch. 11.
- W 2/18:** 3-D arrays, meshgrid, shiftdim.
- F 2/20:** 3-D plots (mesh, surf, contour), More control of figure characteristics, controlling color schemes.
- M 2/23:** HW4 due, HW5 assigned. Importing and exporting data. Read Ch. 6.
- W 2/25:** Review HW4 issues. Reading and writing formatted ASCII files.
- F 2/27:** Checking algorithms: developing test cases. User-defined functions.
- M 3/2:** HW5 due, HW6 assigned. Graphical User Interfaces. Read Ch. 13.
- W 3/4:** Review HW5 issues. More about GUIs and GUI control.
- F 3/6:** Data types and data type conversions. Working with character strings.
- M 3/9:** HW6 due. Reading NetCDF files. Read Ch. 8.
- W 3/11:** Review HW6 issues. Writing NetCDF files. Review for Test 2.
- F 3/13:** *** TEST #2 ***
- Week of 3/16/2015: SPRING BREAK - NO CLASSES**
- M 3/23:** HW7 assigned. Mapping with M_MAP: introduction, installing, projections. Read M-Map handout.
- W 3/25:** Mapping with M_MAP: using hi-resolution bathymetry and coastline datasets.
- F 3/27:** Mapping with M_MAP: plotting vectors and contours on maps

M 3/30: HW7 due, HW8: propose final project. Animations: Flat graphics files with Javascript controls. Read Ch. 9.

W 4/1: Review HW7 issues. Animations: creating and structure all within Matlab

F 4/3: Animations: controlling, and exporting.

M 4/6: Final project proposal due, HW9 assigned. Accessing data through the internet: urlwrite. Read Ch. 7.

W 4/8: Review HW8 issues. Accessing data through the internet: OpenDAP.

W 4/10: Accessing data through the internet: OpenDAP, continued.

M 4/13: HW9 due. Homework: work on final project. 1- and 2-D interpolations. Read Ch. 14.

W 4/15: Review HW9 issues. Regressions and correlations.

F 4/17: Fitting polynomials to data.

M 4/20: Homework: work on final project. Embedded control statements (eval). Read Ch. 12.

W 4/22: Working with dates and times. Review for Test 3.

F 4/24: *** TEST #3 ***

M 4/27: Homework: work on final project. Other MATLAB tools and resources. Read Ch. 10.

W 4/29: Useful tricks and techniques: some final miscellaneous helpful hints.

F 5/1: Final project presentations (10 min. ea).

M 5/4: Final project presentations, continued. Class wrap-up.

Curriculum Committee SFOS

Members: Trent Sutton (Chair)
Brenda Konar
Ana Aguilar-Islas
Andres Lopez

25 August 2014

Trial Course

Course Number: MSL 494

Course Title: Computer Programming for Scientific Applications

Instructor: Danielson

First Time of Offering: Yes

General Comments and Recommendations:

The course looks very interesting, should be a nice addition to SFOS academic programs.

Faculty Senate Form:

Clarify and Address the following:

- For course format, list lecture for the mode of delivery.
- The catalog description must follow the example provided on the form (please revise to include the course title and number). Also, prerequisites must be included at the very end of the description.
- Regarding prerequisites, is there any need to have a background in programming? What if students from other programs outside of MSL (e.g., Fisheries, NRM, Biology) take the class? Would they be prepared?
- Check "No" for section 11A.
- For section 15, state "none".
- For Estimated Impact, need to state if will need a classroom with videoconference equipment (or not if no plan to videoconference the class). Do you or the students need access to a computer lab? Are there computer labs available with Matlab? Has the GPMSL Head and SFOS Dean approved a salary line for the research faculty instructor.
- The library needs to be contacted to make sure that they have the course textbooks to place them on reserve for students that do not purchase them or have other access to the reading materials.
- For Section 20, need to state that this course will have a positive impact for SFOS students in GPMSL and FISH. Has this course been discussed with the GPMSL Head? If so, should state as such in this section.
- For Section 21, may want to include how this course will particularly benefit students enrolled in MSL 632 Physical Oceanography, which is a required core course for oceanography students.

Syllabus:

- This course will use Matlab. Are there concerns with students sharing site licenses? Why not use R which is available at no cost?
- The course description must match the catalog description.
- For the Course Overall Goal, state MSL 632 Physical Oceanography.
- For Evaluation, what is relative attendance? How will this be used for grade evaluation? Also, you state that “A missed quiz...”; however, there are no quizzes (should this state “test”?). How will participation and the homeworks be evaluated?
- You should also reference the UAF academic honesty policy – either state it in your syllabus or provide a link to it so that it is explicitly spelled out for students (this can save you a lot of problems if there is an issue with student cheating or plagiarism).
- Need to provide readings on the class schedule.
- Provide a deadline for students to propose the final project to the instructor. What is the length of the final presentations?