Primary Purpose:
To develop a strong understanding of the issues and concepts underlying the science and art of merging data with models, and to review and critique recent developments in this field. You will gain a firm foundation in the Bayesian principles of assimilating information, how to implement this theory in the form of practical and efficient methods, and how to reflect uncertainty in the model predictions.

Secondary Purpose:
When presenting at a scientific meeting, you can expect to be well received if your material is interesting, organized and tailored to the audience, and your communication is lively and professional. Conversely, as a member of the audience, your ability to raise penetrating questions, and to critique the methods and conclusions, will help in absorbing and integrating the new material. This class will sharpen your communication skills and ability to discuss various points of view in an effective manner, skills which will be very useful in your professional career.

Format (3 credits fixed):
This 3-unit class will meet once a week for 3 hours, and will involve lectures, reading, discussion, and preparation and presentation of seminars. After an introduction to the philosophical and practical concepts underlying modeling and data assimilation, each student will review and synthesize material from ~3 publications (selected from a list of topics) and make a seminar presentation to the class, with an emphasis on concepts (not technical details). Each seminar will be followed by a group discussion. At the end of the semester, each student will prepare a written report on their topic. A bound copy of the collected reports will serve as a useful future reference.

Prerequisites:
A willingness to participate actively and to do justice to the material by exploring it in depth. Required background is college-level mathematics and physics. A maximum of 10 students will be accepted. Students must enroll for 3 units. Audits must participate fully and do all assignments.

Topics may include:
Bayesian Principles, Recursive Estimation, Uncertainty Analysis, Prediction Uncertainty, Model Evaluation, Assimilating Remotely Sensed Information, Kalman and Extended Kalman Filters, 2nd Order Methods, Ensemble Methods, Multiple Model Methods, Particle Filters.

** Please note the section number (Section One) when signing up **