Naval architecture is a related—but distinctly different—field of design compared to civil architecture and engineering. Boats must float, they are always in motion (sometimes violently so), they fly through both the water and the air, and there are many unique forces and performance issues that must be addressed during design. Decks are both living spaces and parts of working machines, and space below is often at a premium, necessitating compact and innovative interior arrangements. Moreover, the principal units of form are curves, rather than straight lines, giving rise to a whole range of special problems in design and construction—and a world of form that, at its best, is achingly beautiful.

This Fall I will be again offering a small ‘Special Problems’ course, with two objectives in mind: The first is to involve a small group of dedicated students in an ongoing design and research project, the design of a 220-ton, two-masted wooden sail-training schooner. At this point, we are in a critical phase of design development: current work includes hull form modeling in Rhino 3d and the plug-in Orca 3D; parametric analysis of hull forms using the scripting tool Grasshopper; fabrication of wooden half-models utilizing automated CNC technology; detailed design drawings in AutoCad; and rig and sail plan design. We will also begin work on the design and construction of large-scale models of the hull and rig (again using CNC fabrication technology) for subsequent hydro-dynamic testing in towing tanks in Southampton and Naples, and aerodynamic testing of the rig in a twisted-flow boundary-layer wind tunnel in Milan.

The second objective is to provide a structured forum for students to study the fundamentals of naval architecture, including:
• preliminary design and planning; • hull form, ship’s lines and ship’s geometry; • ship stability; • ship construction, with an emphasis on wooden boats; • hydrodynamics of ship’s hulls; • aerodynamics of sails and sailing vessels; • rig design and sail balance; and • various performance parameters.

This class will not be run like a typical subject elective with material presented in lecture format. Students must be self-motivated, and independent work will be expected. Background readings will be assigned and we will meet as a small working group in seminar format to discuss issues ranging from theory and engineering to design process and aesthetics.

This class will be offered as a variable (2-4) credit class, and if taken for 4 credits, may count towards the department’s advanced technical elective requirement. Admission to the class is by instructor permission only.

Instructor: Stephen Duff  Interested students please contact me by e-mail at sduff@uoregon.edu. Meeting times TBA.