COMPUTER SCIENCE INSTRUCTION 1520.1F

From: Chair, Computer Science Department

Subj: COMPUTER SCIENCE AND INFORMATION TECHNOLOGY CAPSTONE PROJECT INSTRUCTION

Ref: (a) ACDEANINST 1531.6E dtd 07 December 2005

Encl: (1) Capstone Customer Acknowledgement Form

1. Purpose. To establish Computer Science department guidelines and requirements for the Computer Science (CS) and Information Technology (IT) Software Engineering course, IC470, and Capstone project course, IC480.

2. Cancellation. COMPSCIDEPTINST 1520.1E

3. Background. The CS and IT capstone project and course, IC480 is intended as an interdisciplinary culminating event in the CS/IT curriculum. The focus is to further expose students to concepts and methods used in designing and implementing information technology systems, including Software Life-Cycle, Software Process, system requirement definition, requirement analysis, system design, testing and project management techniques and tools.   The intent of the course is to expose students to the requirements and expectations of professional software engineering and project development in a team-oriented, time-constrained environment in which students must work with an external agency/customer to develop requirements, implement design and provide testing for a complex software project that goes beyond their earlier coursework. Although the expectation is that midshipmen will complete the capstone in their 1/C year, the capstone itself is tied to the two-course series, and may be completed earlier by someone ahead of matrix.

4. Capstone Committee. The Capstone Committee will be chaired by the IC470 Course Coordinator (Fall semesters) and the IC480 Course Coordinator (Spring Semesters). The committee will be comprised of the faculty members of the Computer Science Department. The Capstone Committee has final approval/rejection authority and oversight of all capstone proposals and projects.

5. Software Engineering (IC470) and the Capstone (IC480) courses. Although the capstone project itself is normally completed in the 1/C Spring as part of the Capstone course (IC480), the capstone projects will normally begin in 1/C Fall as part of the Software Engineering course (IC470). In that course, midshipmen will form teams, select a project and submit a proposal for approval by the Capstone Committee. Processes for this are described below.

6. Requirements. All capstone courses and projects must adhere to the following guidelines and requirements. The Course Coordinator and individual instructors are not limited by these requirements and may include additional requirements as necessary.

   a) Teams. Midshipmen enrolled in Software Engineering (IC470) form into teams of no fewer than three individuals. Teams of more than five midshipmen will only be allowed on a case-by-case basis and will require the approval of the Capstone Committee. Teams should contain at least one CS major and one IT major. Any midshipman not on a team by the point detailed in Paragraph 5.a of this instruction will be assigned to a team by the Course Coordinator. Teams may be shuffled as deemed necessary by the Capstone Committee.

   b) Project Proposal. Student teams will choose and develop a project proposal that will be submitted to their IC470 instructor for approval by the Capstone Committee no later than the times specified in the Capstone Requirements Timeline section below. The proposal must include, at a minimum, a project description, a listing of the various roles required by the project and which team member is assigned to the role, a proposed work-load break-down for each team member and a list of project milestones, including due-dates for successful testing of project objectives.

   c) Project Scope. The project shall be a broad problem or requirement that incorporates several areas of knowledge within the CS and IT. The project shall draw from at least two subject areas within the CS/IT curriculum and require the students to sufficiently expand upon their knowledge respective to their major. Each member of the project team shall take the lead on at least one sub-system, and be a back up to the lead on at least one other sub-system. The project shall be designed to address and solve a specific real world need.

   c) Customer. Each project team shall have a customer for whom the team is developing the proposed project solution. The customer shall be an individual, office, organization or athletic team associated with the Naval Academy or the Department of Defense. The customer may not be a midshipman. The customer must agree, in writing via enclosure (1), to serve as the team's customer. The customer is expected to provide project requirements input/feedback, progress review at regular intervals and final project delivery acceptance and feedback.

   d) Technical Advisor. Team's whose Customer is not a faculty member of the Computer Science Department are required to have an instructor from the Computer Science Department serve as a Technical Advisor to the team. The Technical Advisor shall serve as an information resource for the team members to use as needed to overcome areas of difficulty while implementing their design choices. The Technical Advisor is not expected to direct or endorse any specific design or implementation decisions or project features. The technical advisor should primarily serve as a guide for the project.

7. Capstone Requirements Timeline. The following timeline is intended to serve as a general overview of the expectations of capstone project progression. This timeline does not limit the Course Coordinators of both IC470 and IC480 or the individual instructors from modifying due dates as necessary to meet the needs of the individual courses. For the purposes of this timeline, Week 1 is week in which the Fall term begins as designated by the Academic Dean's Academic Schedule, and any deadline is by WEDNESDAY of the stated week. Any other deadlines are at the discretion of the course coordinators.

 a) Fall, Week 3. Tentative Midshipmen teams submitted to their Software Engineering (IC470) instructors.

 b) Fall, Week 5. Teams identify customer (and technical advisor if required) for the project and submit the Capstone Customer Acknowledgement Form, enclosure (1) to their instructor.

 d) Fall, Week 8. Teams submit project proposal to instructor for approval by Capstone Committee.

 e) Fall, Week 13. Final deadline for all teams to have final approval of capstone project proposal by Capstone Committee.

 f) Spring, Finals Period. Teams will deliver final product to include a poster session and oral defense. Other Spring deadlines will be presented in the IC480 course.

8. Project Changes. Due to the dynamic nature of software project proposals, it is necessary to inject reasonable flexibility into the process. For example, teams may reconfigure their membership after Week 3 with the approval of their IC470 or IC480 instructor. However, significant changes to an approved capstone project, as defined by the instructor, need the approval of the Capstone Committee.

9. Exceptions. There are several exceptions to the capstone requirement:

 a) Trident Scholars. Midshipmen participating in the Trident Scholar program shall have their Trident Projects accepted as satisfaction of the capstone project requirement for graduation.

 b) Bowman Scholars. Midshipmen participating in the Bowman Scholar program will need to take both IC470 and IC480. They may extend their Bowman project as their capstone project, provided it meets the regulations described in this instruction.

 c) VGEP. Midshipmen participating in the VGEP program will need to either execute their project in their 1/C Fall semester or in a prior year. If the VGEP scholar completes the capstone 1/C Fall, the department will make every effort to find other midshipmen to work in a team. If this proves impossible, a VGEP Scholar may work on an individual project. The project proposal for VGEP Scholars starting the capstone 1/C Fall must be approved before the start of the Fall semester.

10. <u>Project Ownership</u>. The software developed as part of the capstone course becomes property of the DoD. The Computer Science Department does not assume any responsibility for maintaining the software produced for any customer of the capstone project. The customer may use the software within the context of their USNA affiliation, and may not distribute it without approval from the USNA legal office.

D. M. NEEDHAM

Computer Science Department Capstone Customer Acknowledgement

For teams whose Customer is not a member of the USNA Computer Science Department

By signing below, the Customer acknowledges that the project developed as part of this capstone coursework becomes the property of the DoD, and that the CS Department does not assume any responsibility for maintaining the software produced for the Customer. The Customer may use the software within the context of their DoD affiliation, and may not distribute it without approval from the USNA legal office.

Capstone Team Leader Name_____

Capstone Project Title _____

Customer Name (printed) _____

Customer Contact Info (email/phone) _____

Customer Affiliation _____

Customer Signature _____

Technical Advisor Name (must be a
member of the Computer Science Department Faculty) _____

Date_____