OR 683 / SYS 680 / ECE 670
Principles of C4I

Instructor: Daniel T. Maxwell, Ph.D.
Location: University Hall Room 1202

I.   Objective

The course seeks to provide students with a balanced overview of the basic principles of C4I (Command, Control, Communications, Computers, & Intelligence). The successful student will understand the complex relationship that exists among the engineering, psychological, and social issues that must be addressed in the design, development, deployment, and application of C4I systems.

II.   Course Theme

Command and Control has been studied for centuries in the context of military operations. Leadership and decision-making have similarly been studied for many years in the context of business and governmental decision-making. This course will provide engineering students with an appreciation of the complexities involved in the design and development of a "System of Systems". The scope will include military command and control, as well as discussions of other complex command and control arrangements, like emergency response, and multinational operations.

The course will consist of a mixture of lectures, guest speakers, and practical exercises intended to provide students with an appreciation of the multi-disciplinary nature of the problem and some strategies for meeting the challenges presented when providing engineering support for complex systems of systems.

III.   Readings

   a. Alberts, D. & Hayes R. (2006) *Understanding Command and Control,* Command and Control Research Program, Washington D.C.
   b. Maxwell, D. & Tucker, C. (2013) *"Redefining The Intelligence Cycle: A Step Toward More Robust Intelligence Capabilities",* in USGIF Monograph on GEOINT, In Press.

IV.   Assignments and Grading Policy

   a. Homework / Class Participation 30%
   b. Supplemental Reading Presentation / Report – 30%
   c. Final exam – Take Home 40%

V.   Course Outline (By Week)

Principles of C4I

Date	Topic
27-Aug	Class Intro and Overview of C4I
3-Sep	C2 Fundamentals and Models
10-Sep	Decision Making
17-Sep	Command Intent
24-Sep	Situational Awareness / Information Fusion
1-Oct	Computational Models of Uncertainty
8-Oct	Operational Planning and execution
15-Oct	No Class (Columbus Day)
22-Oct	C4I in Complex Operations
29-Oct	Measuring Effectiveness of C4I
5-Nov	C4I Experimentation
12-Nov	Technology and C4I
19-Nov	Architectures and C4I
26-Nov	Challenges for the Future
3-Dec	Review / Hand out Final Exams
10-Dec	Final Exams Due

VI.   Instructor Availability

The instructor will be available for assistance before and after class, or by appointment. Call (703) 409-7828 to arrange a time.