

# **Modeling and Simulation for Peace Operations**

## **PUBP 710-004**

Arlington Campus Room 246

Professor Ted Woodcock and Professor David Davis

Tuesday 4:30-7:10 p.m.

The *Modeling and Simulation for Peace Operations* course will give its students a unique hands-on ability to develop and use computer-based models to study the nature of specific peace operations. Principles of peace operations will be reviewed; selected case studies will be discussed; and the factors, resources, and processes that determine the outcome of peace operations will be described. An introduction to modeling and simulation will be achieved by using models developed by the course faculty and programmed in a user-friendly software system. That programming involves drawing flow charts and specifying the properties of the model components. These activities will provide the ability to build and use computer-based models of peace operations.

Peace operations take place in complex, unstable, and poorly understood societal environments. They involve the interplay of military, political, civilian police, judicial, public opinion, economic, ethnic, religious, and other factors. Operational success can be determined by an ability to provide timely access to medical, potable water, food, shelter, adequate security, and other resources. Highly complicated behavior can occur in those environments. Apparently well-thought-out actions can have unanticipated, and often negative, impacts. Small events, magnified by the international media, can influence public opinion, public policy, and governmental support in countries providing operational personnel and resources. Such events have led to withdrawal of support and the abandonment of actual peace operations. Modeling and simulation can provide some of the methods needed to develop the understanding required to address these and other matters in ways that can facilitate actual peace operations.

### **COURSE ACTIVITIES**

1. *Seminar 1: Introduction to the Modeling and Simulation of Peace Operations* will describe the nature and the challenge of undertaking peace operations and how those activities can be assisted by development and use of appropriate models. The software system to be used in the course will be introduced and demonstrated.
2. *Seminar 2: Software Building Blocks I:* will provide an introduction to the systems dynamics-based course software. The students will undertake extensive hands-on use of that software to study and report on a series of introductory programs provided by the course faculty.
3. *Seminar 3: Software Building Blocks II:* will involve the students in extensive hands-on use of the course software to study and report on a series of more advanced programs provided by the course faculty.

4. *Seminar 4: Principles of Peace Operations* will provide an overview of the entities, factors, resources, and processes involved in peace operations and identification of how the development and use of models can provide support to those operations. . This will provide the basis for the development of computer-based models of peace operations to be undertaken during the second half of the course. Initial discussion of potential student project activities will be undertaken.
5. *Seminar 5: Case Study I Military and Security Concerns* will involve extensive hands-on use of a systems dynamics model describing the military and security aspects of peace operations developed by the course faculty. The students will be expected to provide simple modifications to that model, to explore matters of interest in the topic area, and to provide a written report on their activities.
6. *Seminar 6: Case Study II Disarmament, Demobilization, and Re-integration (DD&R)* will involve extensive hands-on use of a systems dynamics model of the disarmament, demobilization, and re-integration (DD&R) aspects of peace operations developed by the course faculty. The students will be expected to provide simple modifications to that model, to explore matters of interest in the topic area, and to provide a written report on their activities.
7. *Seminar 7: Case Study III Humanitarian Relief and Public Health* will involve extensive hands-on use of a systems dynamics model of the humanitarian relief and public health aspects of peace operations developed by the course faculty. The students will be expected to provide simple modifications to that model, to explore matters of interest in the topic area, and to provide a written report on their activities.
8. *Seminar 8: Case Study IV Refugees and Displaced Persons* will involve extensive hands-on use of a systems dynamics model of the refugee- and displaced person-related aspects of peace operations developed by the course faculty. The students will be expected to provide simple modifications to that model, to explore matters of interest in the topic area, and to provide a written report on their activities.
9. *Seminar 9: Project Proposals* will involve presentation and discussion of short proposals for the student projects to be undertaken during the next three weeks of the course. The students will be expected to develop and use the models in a series of studies in areas of their interest. Results of the project activities will be presented in written and verbal reports.
10. *Seminar 10: Project Activities I* will involve use of systems dynamics-based software to construct student-selected peace operations models.
11. *Seminar 11: Project Activities II* will involve continued use of systems dynamics-based software to construct student-selected peace operations models.
12. *Seminar 12: Project Activities III* will involve continued use of systems dynamics-based software to construct student-selected peace operations models.

13. *Seminar 13: Project Report Presentations and Discussions* will be provided by each student. Project reports will be presented both verbally and in written form.
14. *Seminar 14: Using Modeling and Simulation for Future Peace Operations* will consist of a round-table discussion of how the planning, management, and command and control of future peace operations could benefit from the development and use of enhanced models and simulations and other relevant matters.

#### STUDENT EVALUATION

Student Evaluation will be based on:

1. The project report and seminar presentation (50% of the course grade).
2. A written paper on the nature and challenges of peace operations on a topic to be selected by the student with the agreement of the course faculty (20% of the course grade).
3. Reports on the four peace operations case studies to be undertaken during the course. (20% of the course grade).
4. Project proposal for the individual projects to be undertaken by the students as well as general level of participation in the overall course activities (10% of the course grade).

#### REQUIRED READING

Richmond, Barry. 2001. *An Introduction to Systems Thinking*. Hanover, NH: High Performance Systems, Inc.