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# VISUAL BASIC FOR APPLICATIONS IN OPERATIONS RESEARCH

ORSA CEP 03-703

31 March - 4 April 2003, USFK, Korea

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**SYNOPSIS:** The Electronic Spreadsheet is rapidly becoming the standard computational environment of the OR analyst even though it was not developed with the analyst in mind. While the *EXCEL* spreadsheet has many powerful features, in its standard form it is limited in terms of analytical and data handling capabilities. However, by extending *EXCEL* via Visual Basic for Applications (VBA) the spreadsheet may be integrated with databases, presentation tools and many powerful forms of analysis. For example, in his recent book and software, *INSIGHT.xla*, Dr. Sam Savage has used VBA to bring simulation, decision trees and time series analysis to *EXCEL*. This course will show the analyst how to greatly enhance *EXCEL* and integrate it with databases and presentation tools. Two highlights of the course include a discussion of the architecture of Savage's analytical tools and a link between *EXCEL* and *Mathematica*. A topic outline follows:

## Visual Basic Programming Fundamentals

- Creating Custom Functions for *EXCEL* Using Arrays
- Creating User Interfaces
- *EXCEL* Objects: Workbooks, Sheets, Ranges/Chart Objects

## Creating OR Applications

- Recording History: Monte Carlo Simulation & Bootstrapping
- Stepping Through Time: Discrete Event Simulation
- Customized Analysis Generation: Time Series

## Application Building:

- Automated Math Program Formulation
- Decision Trees

## VB Connectivity with Other Resources

- Connecting To Databases: Access & SQL
- Connecting To Other Computation Servers: DLLs, Mathematica & Connecting Across Networks

## Tying it all Together

- Using VBA with Other Programs: Word & PowerPoint
- Creating stand-alone Applications with Visual Basic

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**TEXTS:** Participants will receive Excel Power Programming with VBA by Walkenbach.

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## ANTON ROWE

Anton Rowe graduated from University of California at San Diego with a Bachelor of Science degree in Mechanical Engineering in 1992 and received his M. S. degree from Stanford University in Engineering-Economic Systems and Operations Research in 1997.

While still an undergraduate, he developed a successful C program to aid in the design of composite golf shafts. Anton has since gained expertise with higher-level software languages such as Visual Basic and *Mathematica*. In 1997, he founded Episoft Inc., which developed a powerful link between *EXCEL* and *Mathematica*.

For the last several years, Anton has worked closely with Sam Savage of Stanford University in the development and programming of the Operations Research Applications software in Insight: Business Analysis Software for EXCEL. This text and software has been used extensively in the course Interactive Operations Research in Spreadsheets presented by Dr. Savage. In FY99, Mr. Rowe was assigned to a Faculty Position with the Naval Post Graduate School.

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**ELIGIBILITY:** Military Officers who possess OPMS Functional Area 49 (ORSA) and civilian GS-1515 analysts. A graduate degree in ORSA or ORSA-related field is preferred. This is a special offering for USFK personnel. Others may attend on a space available basis.

**APPLICATION:** Personnel desiring to attend should apply via their Training Officer through the Army Training Requirements and Resources System (ATRRS), Course Code ALMC-SE 03-703.

**USFK POC:** Point of Contact at USFK can be reached at DSN 723-8321.

**PLACE:** Room 103, Bldg 2386, (Collaborative Wargaming Center).

**CLASSIFICATION:** The course is unclassified.

**FUNDING:** Travel and TDY payments for any personnel accepted into the course must be paid by the attendee's parent organization.

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**POINT OF CONTACT:** Further information regarding the ORSA Continuing Education Program may be obtained from the ORSA CEP course director at DSN 539-4249/4226, commercial (804) 765-4249/4226, or e-mail [orsacep@lee.army.mil](mailto:orsacep@lee.army.mil)

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