EEOS 472 – Programming for GIScience Applications

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Office hours:	Mondays	1:00 - 2:00 PM	S-1-060
	Wednesdays	1:00 - 2:00 PM	S-1-060
	Thursdays	1:00 - 2:00 PM	S-1-060
	(or email and make other arrangements)		

Lectures: Thursdays, 5:30 to 8:00 PM, S-3-034

Objectives: This course will provide students with an introduction to object-oriented programming, specifically in the context of geographic information science. Students will become familiar with objects and methods, control of flow concepts, code modularization, and debugging techniques. They will learn to customize ArcGIS, by utilizing dialog boxes and building commands, menus, and tools. By learning to navigate object diagrams and interfaces, skill will be developed in using the existing ArcObjects that form the underlying structure of ArcGIS. This knowledge, accompanied by the ability to make new objects, will provide students with the required coding vocabulary to build applications to address a wide variety of GIScience applications. Students are expected to have completed previous coursework in geographic information science at the 300 level, although no prior experience in programming is required.

Students will be expected to read chapters in the textbook and be prepared to discuss them each week. Class meetings will begin by focusing on the key concepts from the text. This will be followed by weekly lab exercises designed to explore the concepts introduced by the readings and to sequentially build capability and understanding in the application of programming techniques to GIScience applications. These exercises will make use of Visual Basic for Applications (VBA), which is integrated into the ArcGIS desktop geographic information system (GIS), to provide an opportunity for hands-on learning.

Text: Robert Burke. Getting to know ArcObjects – Programming ArcGIS with VBA. ESRI Press, 2003.   ISBN 1-58948-018-X.

Course Web Page: http://www.faculty.umb.edu/david.tenenbaum/eeos472

Course Evaluation:	Lab exercises	50%
	Mid-term exam	25%
	Final exam	25%

Students are reminded that they are required to adhere to the Code of Student Conduct, including its provisions related to Academic Honesty.

SYLLABUS

Date	Topic	Reading and Exercises
UNDERSTANDING VISUAL BASIC FOR APPLICATIONS & ARCOBJECTS		
02/03/11	Object-oriented programming and customizing ArcGIS	• Chapter 1 – Programming with objects, pp. 1-4. • Chapter 2 – Building a custom application, pp. 5-35. **Exercises 2A, 2B & 2C**
02/10/11	Using dialog boxes and objects	• Chapter 3 – Creating a dialog box, pp.37-50. **Exercise 3** • Chapter 4 – Programming with objects, pp. 51-64. **Exercises 4A & 4B**
02/17/11	Control of flow and modularization	• Chapter 5 – Code for making decisions, pp. 65-76. **Exercises 5A & 5B** • Chapter 6 – Using subroutines and functions, pp. 77-102. **Exercises 6A, 6B, 6C & 6D**
02/24/11	Using loops and debugging code	• Chapter 7 – Looping your code, pp. 103-118. **Exercise 7A & 7B** • Chapter 8 – Fixing bugs, pp. 119-132. **Exercise 8**
03/03/11	Making objects and using interfaces	• Chapter 9 – Making your own objects, pp. 133-145. **Exercises 9A & 9B** • Chapter 10 – Programming with interfaces, pp. 147-170. **Exercises 10A & 10B**
03/10/11	Mid-term Review	N/A
03/17/11	*March Break*	*N/A*
03/24/11	Mid-term Exam	N/A
03/31/11	The object model, UML diagrams, and making tools	• Chapter 11 – Navigating object model diagrams, pp. 171-197. **Exercises 11A & 11B** • Chapter 12 – Making tools, pp. 199-225. **Exercises 12A, 12B & 12C**
USING ARCOBJECTS		
04/07/11	Using existing commands and adding layers	• Chapter 13 – Executing commands, pp. 227-238. **Exercise 13** • Chapter 14 – Adding layers to a map, pp. 239-261. **Exercises 14A & 14B**
04/14/11	Map symbology and ArcCatalog	• Chapter 15 – Setting layer symbology, pp.263-293. **Exercises 15A, 15B & 15C** • Chapter 16 – Using ArcCatalog objects in ArcMap, pp. 295-314. **Exercises 16A & 16B**
04/21/11	Displaying and selecting features	• Chapter 17 – Controlling feature display, pp. 315-338. **Exercises 17A & 17B** • Chapter 18 – Working with selected features, pp. 339-357. **Exercises 18A & 18B**
04/28/11	Working with layouts and editing data	• Chapter 19 – Making dynamic layouts, pp. 359-376. **Exercises 19A & 19B** • Chapter 20 – Editing tables, pp. 377-401. **Exercises 20A & 20B**
05/05/11	Final Review	N/A
TBA	Final Exam	N/A