# Computer Applications in Environmental Sciences

**The University of Toledo Department of Environmental Sciences**

**EEES2500-001 10172**

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**Instructor**: Dr. Don Stierman – dstierm@utnet.utoledo.edu
Office Hours: **W 11 – 2, R 11 – 1 in BO 3045A 419-530-2860 Spring 2015**
Laboratory door (hallway door) should be unlocked. Please do not knock, just come in.

**Class meets in BO 1010 (student computer cluster) from 1 to 2:40 PM Tuesdays**
1 credit hour.

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**CATALOG DESCRIPTION: Desktop computer uses by scientists: word processing, spreadsheets, data bases, e-mail and WWW, table digitizer, processing GPS and data logger files, contour and mapping software. [Fall, Spring] Prerequisite: EEES 1010 or 2100; knowledge of algebra, plane geometry and basic trigonometry.**

**COURSE OVERVIEW: These are computer applications most other DES faculty and I use frequently. Most jobs in environmental fields require a working knowledge of Microsoft Office (Excel, Word. PowerPoint) and well as skills in preparing maps.**

## STUDENT LEARNING OUTCOMES

Students will learn to use **Excel** to organize, process and display data. Students will learn, when given a data set, to plot contour maps and surface representations through using **Surfer**. Students will learn to properly edit, label and display such graphics and to print hard copies of optimized results. Students will learn to write documents using **Microsoft Word**, to use a variety of fonts and styles, to insert equations and special symbols, and to format their composition. Students will learn to send and receive files and messages via networks. Students will learn to draw and color simple maps using **Adobe Illustrator**, to edit and improve maps through use of a variety of line types and fill patterns, and export easily read files showing optimized results. Students will learn basic operations of database software. Superior students will learn to integrate applications.

## TEACHING STRATEGIES

I post detailed instructions and data several days before the weekly class meeting. **Preview these, please**. I open class with a demonstration on where key menu items are found and how to use important dialog boxes. You then have to go through similar steps with a different data set while I provide one-on-one coaching upon request. Expect a bit of frustration: you do not learn if you are not forced to experiment a bit in solving the puzzles of each applications. Solving these puzzles yourself shows you are learning.

## PREREQUISITES AND COREQUISITES

**EEES 1010 or 2100; knowledge of algebra, plane geometry and basic trigonometry.**

## REQUIRED TEXTS AND ANCILLARY MATERIALS

**There is no textbook. Please read the detailed instructions posted weekly on Blackboard.**
**Each student is required to have a flash drive[1] (at least 1 gigabyte capacity recommended) devoted to this class.**
**Each student will need a field book[2] for outdoor exercises after Spring arrives.**

[1] You should write a **text file** to your thumb drive "This device belongs to (your name), if found please deliver to Dr. Stierman in BO 3045A or to the secretary in Departmental office, room 1235 Wolfe Hall." I title my file "This device belongs to."

[2] You do not need a new field book if you have one with at least a dozen open pages from a previous class. All scientists who work out of doors use field books.

## TECHNOLOGY REQUIREMENTS

**This class is entirely electronic except for a 1-page handout for the outdoor GPS lab. Weekly instructions will be posted on Blackboard - https://blackboard.utdl.edu/ - and all assignments are submitted in MS Word or .pdf format attached to a Blackboard Message (*not email!*).[3]**

## COURSE EXPECTATIONS

**Students are expected to be at a desktop in BO 1010 and logged in to Blackboard at 1 PM sharp[4] each Tuesday. Students are expected to work on each week's project until the project is completed and submitted or the clock reads 2:40 PM – end of the period. Each project is due before noon on the following Tuesday.**

**Students are *encouraged* to share their knowledge[5] with other students. However, sharing the products[6] of your work is academic dishonesty.**

**If a student can independently complete a weekly project before the class meeting, attendance is not required.**

**Students who need help are expected to seek help during office hours. However, please send me an email to see if I am available at other times if you need help outside office hours.**

## GRADING

**Each project will be graded on the A – F grading scale. Late projects are subject to one letter grade per week reduction. If you are disappointed is a project grade, please see me during office hours and we will look at your submission together. I will explain the most important flaws, blunders or omissions.**

**A project grade of IN or .xlsx (or other format extension) means I could not open your submission or you sent an application document, not Word or .pdf - Resubmit.**

### *Midterm Grading*

I do my best to post grades to the Blackboard grade book. You can calculate an average at any time during the semester.

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[3] This keeps all assignments for this class in one location and it does not fill up my email box.
[4] As a former seismologist with German ancestors, I am a bit of a fanatic with respect to punctuality.
[5] For example: helping other students navigate application menus, showing other students how to write and equation, label an axis, add colors, change symbols – in other words, teaching one another how to better use the software in order to generate superior results.
[6] Graphs, maps, digital elevation models, the sort of things you send to the instructor for grading

## *Final Grading*

**The final grade is based on:**

**75% weekly projects**
**15% final project (take-home final – there is no in-class final exam)**
**10% Professional Conduct[7]**

## COMMUNICATION GUIDELINES

Do not hesitate to wave your arm during my demonstration if I am moving too fast. You are probably not alone.

Please quietly ask the student beside you for advice if you are having trouble. Please help one another get around the minor roadblocks.

Use email (***never*** *a Blackboard* ***Message***) to contact me if you need a prompt response – I usually review my email morning and evening even when at home for the day.

## COURSE SCHEDULE

**1/13: Advanced tricks in MS Word**
**1/20: Excel 1: Graphing trigonometric functions**
**1/27: Excel 2: Is the growing season getting longer in Toledo?**
**2/3: Excel 3: Toledo temperatures since 1873**
**2/10: Excel 4: Running averages**
**2/17: Excel 5: Temperature statistics**
**2/24: Excel 6: Linear regression**
**3/3: Surfer 1: Digital elevation models and contour maps**
**3/10: spring break, no class meeting**
**3/17: Surfer 2: Extracting topographic profiles**
**3/24: Introduction to Adobe Illustrator (block diagram)**
**3/31: More Adobe Illustrator (gold map)**
**4/7: ETrex GPS (field lab – be prepared to spend 2 hours outdoors)**
**4/14: MapSource and Google Earth (download GPS data)**
**4/21: Access 1: Introduction to database**
**4/28: PowerPoint; Final (take-home) projects posted**
**5/5: Final projects due**

**Always close a file and exit the application before attaching your document to a Message. Attaching an open file results in errors.**

[7] I am pleased to report that all students during the past 5 yours have received top marks in this category. Please continue this proud tradition.

## ACADEMIC POLICIES

An **excused absence** is granted in the event of serious personal or health issues prevents a student from attending class. Documentation is required! A copy of a medical bill or pharmacy receipt (student or student's child) is sufficient evidence of health issues. If there is a death in the family, please bring a copy of the obituary. Project deadlines will be extended as the situation dictates.

In the event of a Level I snow emergency, class will meet but office hours will be extended so that students who think it too dangerous to drive can get help later in the week. In the event of a Level II or III snow emergency, class will not meet and the course schedule will be adjusted.

# Professional conduct

1. Thou shalt use the cluster for scholarly endeavors – thus willst thou live long and prosper - and shalt not consume thy precious hours in the computer cluster playing games.

2. Thou shalt check spelling and preview documents and graphs (and make all necessary improvements and edits) **prior to submitting them for assessment**.

3. Thou shalt share thy gifts of wisdom and knowledge – but not thy files - with thy neighbors, so that all may develop skills and achieve excellence.

4. Thou shalt follow all instructions issued by the Network Administrator, whose words are more sacred than mutterings of even thy Professor in matters of thy account and the Network, and inform him of breakdowns and problems.

5. Thou shalt not print what can be read just as well on the monitor. All assignments shall be submitted as electronic documents. Save those trees!

6. Thou shalt not soil thy keyboard with dirt, food or drink.

7. Thou shalt not open or download files that might infect thy workstation or the Network.

8. Thou shalt not display on screen that which thou wouldst hesitate to show to thy mother or potential employer.

9. Thou shalt be punctual, attend class faithfully, and read (and follow!) instructions thoroughly.

10. Thou shalt not bring dishonor upon the Department through intemperate or foolish posts. Facebook and email are forever – never post something you do not want a potential employer to discover.

Failure to abide by these rules *might* (as I've been informed by a former Network Administrator) cause Ming the Merciless to crash the planet Mongo to into the Earth. I have been unable to verify this rumor but **why take a chance?**

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**UNIVERSITY POLICIES** *The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.)*

**Academic Accommodations** *The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the Student Disability Services Office.)*

To the left is an image of a typical field book. This one is 4.5" wide and 7" high. Inside, the left page is divided into lines and columns, where I record numerical data. The right page is more of a grid. I record notes and drawing on the grid. Your name and contact information goes on the first page. Begin each day's work on a clean set of pages. Fir first comment is date, project, and names of other essential persons participating in the project. Never erase errors – draw a line through an error and record the correct value, along with a comment.