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Fall 2015

ENCE 2302

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Civil Engineering 2302/2303
CIVIL ENGINEERING COMPUTING & GRAPHICS

CATALOG DESCRIPTION

ENCE 2302/2303 Civil Engineering Computing & Graphics **3 cr. Lec / 1 cr. Lab**

Introduction to Fortran programming and spreadsheet design for civil engineering applications. Fundamental graphical concepts and related material as they apply to the technologies utilized in the field of civil engineering.

PREREQUISITES

College algebra and trigonometry (MATH 1126).

TEXTBOOK

1. Nyhoff, Larry R. and Leestma, Sanford C. (1999 or 1997) Introduction to Fortran Programming for Scientists and Engineers, Prentice Hall, Inc., New Jersey, 07458. ISBN: 0-13-013146-6
2. Bertoline, Gary R. (2009 or 2006) Introduction to Graphics Communications for Engineers, McGraw Hill, Inc., New York, NY, 10020. ISBN:0-07-295084-6

COURSE OBJECTIVES After successfully completing this course each student will be able to:

1. Apply the basic steps of programming including problem analysis and specification, algorithm development for the given equations, program coding with a current Fortran editor and compiler, and program execution and testing as applied to civil engineering problems.
2. Given the required data, equations, and procedure, solve a given Civil Engineering problem using the current version of the Microsoft Excel spreadsheet application for calculations and data analysis.
3. Create a design sketch using pencil.
4. Reproduce technical graphics related to Civil Engineering applications according to ANSI standards and conventions using a current version of AutoCAD.

COURSE TOPICS AND SCHEDULE

Computer Programming (4.5 wks)

- Introduction to computing
- Basic Fortran
- Selective execution
- Repetitive execution
- Input/output
- Functions, subroutines
- Arrays

Spreadsheet Applications (2 wks)

- Microsoft Excel 2000 Introduction, Working with Workbooks, Formatting
- Using Functions and Calculations, Multiple Worksheets
- Using Charts, Word, and Web, Spreadsheet Data Analysis

Graphics Communication (7.5 wks)

- Standards in graphics communication and CAD
- AutoCAD Lessons 1-3
- Lettering
- Pictorial Sketching
- Multiview projection
- Sectional Views
- Dimensioning Practices
- Set of Drawings
- Piping, Topographic mapping, Reinforced Concrete and Foundations, Structural Steel, drawing examples, etc.

CONTRIBUTION OF THE COURSE TO MEETING PROFESSIONAL COMPONENT

Proficiency in major civil engineering area: This course contributes in the areas of environmental, geotechnical, and structural engineering by assigning programming and graphics exercises in these areas.

RELATIONSHIP OF COURSE TO PROGRAM OUTCOMES

- a) an ability to apply knowledge of mathematics, science, and engineering - This course meets outcome (a) because students are required to write programs and spreadsheets which rely on their knowledge of math, science, and engineering.
- b) an ability to conduct experiments as well as analyze and interpret data - This course relates to outcome b since students learn to use a spreadsheet tool for analyzing and interpreting data.
- e) an ability to identify, formulate, and solve engineering problems - This course relates to outcome (e) because students learn a systematic approach for writing programs to solve engineering problems.
- g) an ability to communicate effectively - This course relates to outcome (g) since students learn CAD techniques for creating drawings which are used for effective communication.
- k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice - This course relates to outcome (k) because students use the latest Fortran 90 standard with a modern editor and compiler. They use a modern spreadsheet tool to analyze and interpret data and the latest CAD standard that is widely accepted in the civil engineering field.

PREPARED BY

Gianna Cothren, Ph.D., P.E., Associate Professor 8/17/15

Schedule

11:00 – 11:50 AM

M W F EN 411 (F is used for extra assistance and assignment completion)

12:00 – 2:1:30 PM

M W EN 411

Exams (30%) There will be one Mid-Term exam and one Final exam. No make-up exams will be given. If you must miss an exam, you are required to make arrangements for rescheduling the week before the exam.

Lab Assignments (50%) Lab assignments are listed on Blackboard and are due the following Monday each week. All assignments must be submitted through the Blackboard Assignments folder by 9:00 AM on Mondays.

Project (10%) One special project will be assigned to each student in the class following the mid-term exam. Students will be expected to complete and give an oral presentation on the project in the last class period.

(Extra Credit) Involvement in the ASCE student organization and design projects (concrete canoe, steel bridge, etc) will strengthen the student's ability to apply design principles studied in engineering mechanics. Students will work on a team with senior students on designing, constructing, and presenting a complete project while gaining valuable leadership skills, problem solving skills, and communication and time management skills. To gain extra credit (3 pts toward final grade), the student will join the team and submit a one-page report on contributions to the effort along with the endorsement of the student organization's committee chairman at the end of the semester.

General

1. Attendance in lecture is required; however, lab assignments can be completed during the allotted time or at any other convenient time. Please note that Instructor/TA assistance is only available during the scheduled lab time. Students not attending lecture, will lose class participation points.
2. Students who must miss a class should make arrangements to get the class notes and assignments from Blackboard or another student in the class.
3. Assignments and due dates are posted on Moodle. **Late assignments without special arrangement will not be accepted.**
4. Students are required to do their own work. Zero credit will be given to any students turning in duplicated work.
5. If the listed office hours are not convenient, you may call and schedule an appointment.
6. Cell phones and beepers must be turned off or put in silent mode. Any disruptions will result in a loss of participation points.

Required Supplies Computer LAN account (<http://uno.mrooms3.net>)
USB memory stick

Instructor Dr. Cothren
EN 823 Phone: 280-3158 Email: gcothren@uno.edu

Office Hours Open door policy – if I am not available I will let you know
Monday - Friday 10:00 - 11:00 or by appointment

Grading Scheme

Exams	30%
Assignments	50%
Participation/attendance	10%
Project	10%
Extra Credit	3 pts toward final grade

Grading Scale

A	90 – 100%
B	80 – 89
C	70 – 79
D	60 – 69
	below 60% is failing

Important Dates*

Last day to adjust schedule w/out fee	08/18/2015
Semester Classes Begin	08/19/2015
Last day to adjust schedule w/fee, or withdraw with 100% refund	08/25/2015
Last day to apply for December commencement	09/25/2015
Final day to drop a course or resign.....	10/14/2015
Mid-semester examinations	10/05-10/09/2015
Final examinations	12/07-12/11/2015
Commencement	12/18/2015

*Note: check Registrar's website for Saturday and A/B sessions, and for items not listed here:

<http://www.registrar.uno.edu>

Fall Semester Holidays

Labor Day	09/07/2015
Mid-semester break.....	10/15-10/16/2015
Thanksgiving.....	11/26-11/27/2015

Withdrawal Policy – Undergraduate only

Students are responsible for initiating action to resign from the University (withdraw from all courses) or from a course on or before dates indicated in the current Important dates calendar. Students who fail to resign by the published final date for such action will be retained on the class rolls even though they may be absent for the remainder of the semester and be graded as if they were in attendance. Failure to attend classes does not constitute a resignation. Check the dates on the Registrar's website, <http://www.registrar.uno.edu>. Please consult The Bulletin for charges associated with dropping and adding courses.

Incomplete Policy – Undergraduate only

The grade of I means *incomplete* and is given for work of passing quality but which, because of circumstances beyond the student's control, is not complete. The issuance of the grade of I is at the discretion of the faculty member teaching the course. For all graduate and undergraduate students, a grade of I becomes a grade of F if it is not converted before the deadline for adding courses for credit (as printed in the Important Dates Calendar) of the next regular semester including summer semester.

Repeat Policy

When a student is permitted to repeat a course for credit, the last grade earned shall be the one which determines course acceptability for degree credit. A student who has earned a C or better in a course may not repeat that course unless, (1) the catalog description indicates that the course may be repeated for credit, or (2) the student's Dean gives prior approval for documented extenuating circumstances.

Graduate Policies

Graduate policies often vary from undergraduate policies. To view the applicable policies for graduate students, see the Graduate Student Handbook: <http://www.uno.edu/grad/documents/GraduateStudentHandbook2014.pdf>

Academic Dishonesty Policy

<http://www.uno.edu/student-affairs-enrollment-management/documents/academic-dishonesty-policy-rev2014.pdf>

Safety Awareness Facts and Education

Title IX makes it clear that violence and harassment based on sex and gender is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here: <http://www.uno.edu/student-affairs-enrollment-management/>

UNO Counseling Services and UNO Cares

UNO offers care and support for students in any type of distress. Counseling Services assist students in addressing mental health concerns through assessment, short-term counseling, and career testing and counseling. Find out more at <http://www.uno.edu/counseling-services/>. First-year students often have unique concerns, and UNO Cares is designed to address those students succeed. Contact UNO Cares through <http://www.uno.edu/fye/uno-cares.aspx>.

Emergency Procedures

Sign up for emergency notifications via text and/or email at E2Campus Notification:

<http://www.uno.edu/ehso/emergency-communications/index.aspx>. All emergency and safety procedures are explained at the Emergency Health and Safety Office: <http://www.uno.edu/ehso/>.

Diversity at UNO

As the most diverse public university in the state, UNO maintains a Diversity Affairs division to support the university's efforts towards creating an environment of healthy respect, tolerance, and appreciation for the people from all walks of life, and the expression of intellectual point of view and personal lifestyle. The Office of Diversity Affairs promotes these values through a wide range of programming and activities.

<http://diversity.uno.edu/index.cfm>

Learning and Support Services

Help is within reach in the form of learning support services, including tutoring in writing and math and other supplemental instruction. Visit the Learning Resource Center in LA 334, or learn more at <http://www.uno.edu/lrc/>.

Affirmative Action and Equal Opportunity

UNO is an equal opportunity employer. The Human Resource Management department has more information on UNO's compliance with federal and state regulations regarding EEOC in its Policies and Resources website:

<http://www.uno.edu/human-resource-management/policies.aspx>

Wk	Day	Date	Ref	Ch	Lecture Topic (12.00-1.00)	Lab Assignment (12:00-2:15)
	W	8/19			Introduction to computing	Introduction, Format, Lettering, Moodle online resources, Programming Assignment -1
	M	8/24			Basic Fortran	Programming Assignment -2
	W	8/26			Selective execution	
	M	8/31			Repetitive execution	Programming Assignment -3
	W	9/2			Input/output	Programming Assignment -4
	M	9/7			Labor Day	Programming Assignment -5
	W	9/9			Functions, subroutines	Programming Assignment -6
	M	9/14			Subroutines	Programming Assignment -7
	W	9/16			Arrays	Programming Assignment -8
	M	9/21			Microsoft Excel Introduction, Working with Workbooks, Formatting	Spreadsheet Assignment -1
	W	9/23			Using Functions and Calculations, Multiple Worksheets	Spreadsheet Assignment -2
	M	9/28			Using Charts, Word, and Web, Spreadsheet Data Analysis	Spreadsheet Assignment -3
	W	9/30			Goal seek, Graphics Communication, Introduction to CAD	Spreadsheet Assignment -4
	M	10/5			Programming Review / Spreadsheet Application Review	
	W	10/7			Mid Term Exam	
	M	10/12			Sketching and lettering, AutoCAD Tutorial 1-3	AutoCAD Lesson 1, AutoCAD Assignment 1
					AutoCAD Tutorial 4-6	AutoCAD Lesson 2, AutoCAD Assignment 2
	W	10/14			AutoCAD Tutorial 7-10	AutoCAD Lesson 3, AutoCAD Assignment 3
	M	10/19			Multiview projection, Multiview sketching	AutoCAD Assignment 4
	W	10/21			Pictorial Sketching	
	M	10/26			Sectional Views, Auxiliary Views	AutoCAD Assignment 5
	W	10/28			Piping	
	M	11/2			Dimensioning	AutoCAD Assignment 6
	W	11/4			Topographic Drawings	
	M	11/9			Introduction to Structural Steel	Typical framed beam connection details, AutoCAD Assignment 7
	W	11/11				
	M	11/16				
	W	11/18			Reinforced Concrete	Foundation design drawing/ Retaining Wall, AutoCAD Assignment 8
	M	11/23				
	W	11/25				
	M	11/30			Review Exam Handout	
	W	12/2			<i>Project Presentations</i>	
	M	12/7			Final Exam	