The University Of Toledo

NEW COURSE PROPOSAL

Level (check one)

Undergraduate

Graduate

Will this course impact program requirements? If yes, a Program Modification must be completed.

Type of course (check all that apply):

Academic Skills Enhancement Writing Intensive (WAC) honors

Univ. Core: *English* *Hum* *Math* *Nat.Sciences* *Social Sciences*

Multicultural: *Diversity of US Culture* *Non-US Culture*

Transfer module: *Arts& Hum* *Engl* *Math* *Nat Sci & Phys* *Soc Sci*

(to be considered as core curriculum, question 18 must be completed)

1. College: ENG

   Department: TE

2. Contact Person: Ted Evans Phone: 530-3349 Email: william.evans@utoledo.edu

3. Alpha/Numeric Code (Subject area - number): GNEN - 5500

4. Proposed title:

   APPLICATIONS OF ENGINEERING ANALYSIS

   Proposed effective term: SPRING 2011

5. Planned enrollment per section: per term: 10

6. Is the course cross-listed with another academic unit? Yes ☑ No

   Is the course offered at more than one level? Yes ☑ No

   If yes to either question, please list additional Alpha/Numberic codes, and submit a separate New Course form or Course Modification form for the course(s) referenced below.

   a - b. - c. -

   Approval of other academic unit (signature)

   Name and title

   If course is to be offered at more than one level, attatch an explanation of the different requirements that students must meet for each level. If the requirements are the same for each level, justification must be provided.

7. Credit hours: Fixed: 3 or Variable: to

8. Delivery Mode:

	Primary	Secondary	Tertiary
a. Activity Type*	Computer Assisted I		
b. Minimum Credit Hours	3		
Maximum Credit Hours	3		
c. Weekly Contact Hours	3		

*Choices are: Lecture, Recitation, Seminar, Regular Lab, Open Lab, Studio, Clinic, Field, Independent Study, Workshop, Computer Assisted Instruction, Other

9. Terms offered: ☑ Fall ☑ Spring Summer

   Years offered: ◉ Every Year Alternate Years

10. Are students permitted to register for more than one section during a term? ◉ No Yes

Administrative Use Only

Code:

Approved (senate or Grad Council)

Effective Date: / / (mm/dd/yyyy)

CIP Code:

Sub: Prog: Level:

11.

Grading System:	Undergraduate	Gradute
	Normal Grading (A-F,PS/NC,PR, I)	(•) Normal Grading (A-F,PS/NC,PR, I)
	Passing Grade/No Credit (A-C, NC)	Grade Only (A-F)
	Credit/No Credit	Satisfactory/Unsatisfactory (G only)
	Grade Only (A-F, PR, I)	Audit only
	Audit only	No Grade
	No Grade	

12. Prerequisites (must be taken **before**): a. - b. - c. -

PIN (Permisson From Instructor) PDP (Permission From Department)

Co-requisites (must be taken **together**): a. - b. - c. -

13.

If course is to replace an existing course(s) will be deleted, and when should that deletion occur?

	Course to be removed from inventory	Final Term to be offered (YYYYT, i.e. use 20064 for Fall'06)
a.	ENGT - 5500	20104
b.	-	
c.	-	
d.	-	

14.

Catalog description (**30 words Maximum**)

A course in analysis for engineers. Topics include: Linear differential equations, continuous and discrete series representation. Laplace transforms, matrix methods, eigenvalues and eigen vectors, systems of equations. Prerequisite: Graduate Standing

15.

Attach a copy of a complete outline of the major topics covered. (Providing a syllabus that includes this information is acceptable.)

Syllabus:	Click here to view the Syllabus
Attachment 1	No Attachment
Attachment 2	No Attachment

16.

Where does this course fit in the University/College/Department curriculum? (Be specific by course level, if applicable). Indicate prospective demand.

The GNEN 55600 will be offered to students enrolled in teh Master of Science in Engineering program.

17.

If the proposed course is similar to another course in the College or University, please describe the difference and provide a rationale for the duplication. (If this course duplicates material covered in another course within your department or college or in another college, attach a letter of endorsement from that area's dean and department chairperson indicating their support. Clarify the maner in which this course will differ).

18.

If the course is intended to meet a University Undergraduate **Core** requirement, complete the following and submit a course syllabus using the *template*.

Please explain how this course fulfills the general education guidelines. (*Guidelines* are available in *Faculty Senate Website*)

Course Approval:

Department Curriculum Authority:	Date	/	/	(mm/dd/yyyy)
Department Chairperson:	Date	/	/	(mm/dd/yyyy)
College Curriculum Authority:	Date	/	/	(mm/dd/yyyy)
College Dean:	Date	/	/	(mm/dd/yyyy)

After college approval, submit the original signed form to the Faculty Senate (UH 3320) for undergraduate-level courses; for graduate-level courses submit the original signed form to the Graduate School (UH3240). For undergraduate/graduate dual-level courses, submit the proposals to each office.

Faculty Senate Undergrad. Curriculum Comm.:	Date	/	/	(mm/dd/yyyy)
Faculty Senate Core Curriculum Comm :	Date	/	/	(mm/dd/yyyy)
Graduate Council :	Date	/	/	(mm/dd/yyyy)
Office of the Provost :	Date	/	/	(mm/dd/yyyy)
Registrar's Office:	Date	/	/	(mm/dd/yyyy)

APPROVED

T.H. 2-23-06

The University Of Toledo
NEW COURSE PROPOSAL

Level (check one)
_____Undergraduate
X_____Graduate

Will this course impact program requirements? _____ If yes, a Program Modification must be completed.

Type of course (check all that apply):
_____academic skills enhancement
_____honors
_____writing intensive (WAC)
_____university core. __ *Engl* __ *Hum* __ *Math* __ *Sci.* __ *Soc Sci*
MC: __*US Culture* __ *Non-WesternCulture*
(to be considered as core curriculum, question 18 must be completed)

1. College: Engineering_____
____Department: Engineering Technology_____

2. Contact Person: Ella Fridman_____ Phone: 3273____ Email: ella.fridman@utoledo.edu_

Administrative Use Only
Code: NEW 97492
Approved (Senate or Grad Council)
Effective Date: DUM
CIP Code: 150000
Sub: 12 Prog: 94 Level: 4

3. Alpha/Numeric Code (subject area - number): ENGT - 5500_ _ _ _

4. Proposed title: Applications of Engineering Analysis_____
Proposed effective term: Fall 2006_____

5. Planned enrollment per section: _____ per term: 10____

6. Is the course cross-listed with another academic unit? ___No_____
Is the course offered at more than one level? ___No_____
If yes to either question, please list additional Alpha/Numeric codes:
a. _ _ _ _ - _ _ _ _ b. _ _ _ _ - _ _ _ _ c. _ _ _ _ - _ _ _ _
Approval of other academic unit (signature) _____
Name and title _____
If course is to be offered at more than one level, attach an explanation of the different requirements that students must meet f each level. If the requirements are the same for each level, justification must be provided.

7. Credit hours: Fixed: _3_____ or Variable: _____ to _____

8. Delivery Mode:

	Primary	Secondary	Tertiary
a. Activity Type*	Lecture_	_____	_____
b. Credit Hours	3_____	_____	_____
c. Weekly Contact Hours	3_____	_____	_____

*Choices are: Lecture, Recitation, Seminar, Regular Lab, Open Lab, Studio, Clinic, Field, Independent Study, Workshop, Computer Assisted Instruction, Other

9. Terms offered: X_____ Fall X_____ Spring _____ Summer
Years offered: X_____ Every Year _____ Alternate Years

10. Are students permitted to register for more than one section during a term? X_____No _____Yes
May the course be repeated for credit? X_____ No _____ Yes _____ Maximum Hours

11. Grading system:

Undergraduate	Graduate
_____Normal Grading (A-F, PS/NC. PR, I)	X_____Normal Grading (A-F, PS/NC. PR, I)
_____Passing Grade/No Credit (A-C, NC)	_____Grade Only (A-F)
_____Credit/No Credit	_____Satisfactory/Unsatisfactory (G only)
_____Grade Only (A-F, PR, I)	_____Audit only
_____Audit only	_____No Grade
_____No Grade	

12. Prerequisites (must be taken before): Graduate Standing a. _ _ _ _ - _ _ _ _ b. _ _ _ _ - _ _ _ _
Co-requisites (must be taken together): a. _ _ _ _ - _ _ _ _ b. _ _ _ _ - _ _ _ _ c_ _ _ _ - _ _ _ _

13. If course is to replace an existing, course(s) will be deleted, and when should that deletion occur?

	Course to be removed from inventory	Final Term to be offered
a.	_____	_____
b.	_____	_____

14. Catalog description (30 words maximum).
A course in analysis for engineers. Topics include: Linear differential equations, continuous and discrete series representations. Laplace transforms, matrix methods, eigenvalues and eigenvectors, systems of equations.

NEW COURSE PROPOSAL (NEW)

15. Attach a copy of a complete outline of the major topics covered. (Providing a syllabus that includes this information is acceptable.)

16. Where does this course fit in the University/College/Department curriculum? (Be specific by course level, if applicable). Indicate prospective demand.

    The ENGT-5500 will be offered to students enrolled in the Master of Science in Engineering program

17. If the proposed course is similar to another course in the College or University, please describe the difference and provide a rationale for the duplication. *(If this course duplicates material covered in another course within your department or college or in another college, attach a letter of endorsement from that area's dean and department chairperson indicating their support. Clarify the manner in which this course will differ).*

18. If the course is intended to meet a University Undergraduate Core requirement, complete the following:
    a. Explain how this course fulfills the guidelines established for the competency area identified. *Guidelines are available from Faculty Senate Office, UH 3320, x2112 or x2182.)*

    b. Identify the intellectual competencies which this course is intended to fulfill: *inquiry; communication; understanding mathematical and quantitative concepts; historical consciousness and social awareness; scientific inquiry; values; aesthetic mode of thinking; information acquisition and use.*

    c. How does this course develop the intellectual competencies identified?

Course Approval:

Department Curriculum Authority: Jeff Schrader 10/21/05 Date

Department Chairperson: [signature] 10-21-05 Date

College Curriculum Authority: [signature] 10/25/05 Date

College Dean: [signature] 11/01/05 Date

After college approval, submit the original signed form plus 14 copies to the Faculty Senate (UH 3220) for undergraduate-level courses; for graduate-level courses submit the original signed form plus 6 copies to the Graduate School (UH 3240). For undergraduate/graduate dual-level courses, submit the proposals to each office.

University Undergraduate Curriculum Committee or Graduate Council: [signature] 2-7-2006 Date

Office of the Provost: Daniel J. Kadl 2/22/06 Date

COLLEGE OF ENGINEERING
DEPARTMENT OF ENGINEERING TECHNOLOGY

SYLLABUS

COURSE	**APPLICATIONS OF ENGINEERING ANALYSIS** *(ENGT-5500)*
PREREQUISITE	Graduate Standing
CREDIT	3 semester hours
TEXT	Erwin Kreyszig, "*Advanced Engineering Mathematics*", John Wiley&Sons, Inc., 8th edition, ISBN 0-471-15496-2
SUPPLEMENT	Amos Gilat, "*MATLAB, An Introduction With Applications*", Wiley&Sons, Inc., 2004,ISBN 0-471-43997-5
DESCRIPTION	A course in analysis for engineers. Topics include, linear differential equations, continuous and discrete series representations, Laplace Transforms, matrix methods, eigenvalues and eigenvectors, systems of equations. Emphasis will be placed on applications and on software assisted mathematics
INSTRUCTOR	Dr. Ella Fridman
OFFICE	Scott Park Campus, Engineering Technology Center Office # 1124 Office Hours MW 3:30-5:30pm Phone: 419-530- 3273 Fax : 419- 530-3068 E-mail: ***Ella.Fridman@utoledo.edu***

COURSE OBJECTIVES

On completion of the course students should:

a) understand and be able to develop mathematical models of physical systems using methods studied in the course

b) greatly enhance their capability to confront and solve ordinary differential equations and eigenvalue problems and become adept at using numerical methods for solution of these problems

c) learn to solve problems involving linear algebraic equations and appreciate the application of these equations in many fields of engineering

d) recognize how the Fourier series is used to fit data with periodic functions as well as applications of Fourier transforms in the field of engineering

e) acquire sufficient computer skills to develop their own programs using MATLAB software package

f) learn to use analytical as well as numerical methods to attack and solve practical problems arising in industry.

GRADING POLICY.

Every student is required complete all quizzes and take final exam. The grade will be calculated using weight

Quizzes		30%
Home Work		30%
Final Exam:	Comprehensive	40%

Each student will be expected to contribute to the on-going threaded discussion appearing on the ***Class Discussion Page*** (Bulletin Board) and to participate in the ***Chat Room*** discussions.

GRADE: **A** $\geq$90.0; 90.0>**A-**$\geq$87.0; 87.0>**B+**$\geq$84.0; 84.0>**B**$\geq$80.0; 80.0>**B-**$\geq$77.0;77.0> **C+**$\geq$74.0;74.0> **C** $\geq$70.0; 70.0> **C-** $\geq$67.0; 67.0> **D+** $\geq$64.0; 64.0>**D**$\geq$ 60.0; 60.0> **D-**$\geq$57.0; **F**<57.0

COURSE OUTLINE

1		**MATLAB**
1.1	Supplement Ch. 1-5	Mathematical Modeling Starting with MATLAB
1.2	Supplement Ch. 6-10	Programming in MATLAB Applications in Numerical Analysis
2		**Ordinary Differential Equations (ODE)**
2.1	Ch.1.1-1.7	Separation of Variables Exact Differential Equations Integrating Factors Linear Differential Equations
2.2	Ch.1.7-1.9	Modeling with First order ODE Radiocarbon Dating Mixing Problem Heat Transfer Problem (Newton's Law of Cooling) Boyle-Mariott's Law for Ideal Gases Outflow from the Tank. Torrichelli's Law Electric Circuits
2.3	Ch.2.1-2.9	Second Order Linear ODE

		Homogeneous and Nonhomogeneous Equations with Constant Coefficients
2.4	Ch.2.11-2.12	Modeling with Second Order ODE Free Oscillations (Mass-Spring Systems) Pendulum Torsional Vibrations Forced Oscillations. Resonance Electric Circuits
2.5	Ch.19.1-19.3	Numerical Solutions of ODE Euler's Method Runge-Kutta Methods Project (Bungee Jump)
3		**Linear Algebra**
3.1	Ch.6.1-6.7 Ch.7.1-7.2	Basic Operations with Matrices Linear Systems of Equations Gauss Elimination Determinants Eigenvalue Problems. Applications: a) Stretching of an Elastic Membrane b) Mass-Spring Systems with Several Masses and Springs
3.2	Ch.18.1-18.8	Numerical Methods in Linear Algebra Gauss Jordan Method LU Decomposition Iterative Methods
3.3	Ch.3.1-3.6	Systems of Differential Equations Homogeneous Linear Systems with Constant Coefficients Applications: Mixing Problem Involving Two Tanks Electrical Network
4		**Laplace Transforms**
4.1	Ch. 5.1- 5.7	Laplace Transform. Inverse Laplace Transform Solving Differential Equations with Laplace Transform Models of Electric Circuits
5		**Fourier Analysis**
5.1	Ch. 10.1-10.6	Continuous Fourier Series Forced Oscillations
5.2	Ch.10.9-10.11	Discrete Fourier Transform Fast Fourier Transform The Power Spectrum
5.3		Signal Processing Applications (Project)