Appendix I
Section B. Course Syllabi

Department of Physics ABET Course Syllabi were formatted to conform to the Engineering Physics ABET Program Outcomes.

The Electrical Engineering ABET Course Syllabi were formatted to conform to the EE ABET Program Outcomes.

The Mechanical Engineering ABET Course Syllabi were formatted to conform to the ME ABET Program Outcomes.

The Program Outcomes ***(a)*** thru ***(k)*** are the same for the EP, EE, and ME programs. However, the Educational Objectives for the three programs differ slightly.

Other Course Syllabi are not formatted to the ABET format as they do not measure any of the EP Program Outcomes.

Course Information	**ME 102 ME Orientation** Sections 1 & 2	**1 credit - required**	**Spring 2006**
INSTRUCTOR	David Seigel Office: JH 13 Phone: 312-2759 Email: dseigel@nmsu.edu		
ASSISTANTS	Eric Winstead		
OFFICE HOURS:	By appointment only. To schedule an appointment email or call the instructor.		
CATALOG DESCRIPTION:	Students are introduced to the world of mechanical engineering. Emphasis is placed on tours of ME labs and NMSU facilities that illustrate possible career paths for mechanical engineers. Students are introduced to the faculty of the department, student organizations, and support services available at NMSU. The role of good communication skills, using modern technology, team building, and intellectual property are reviewed. Students are advised in planning the balance of their academic program.		
PREREQUISITES	No Prerequisites.		
TEXT:	There is no text book for this class. All material will be given out in class.		
CLASS SCHEDULE:	Tuesday (Section 1) / Thursday (Section 2) 11:45-1:00 p.m. JH 209		
GRADES:	Class Attendance 25 % Homework/Quizzes 20 % Projects 35 % Participation 20 %		
EXTRA CREDIT:	▪ Each ASME meeting you attend will earn you 1% extra credit on your final grade. ▪ An additional 5% extra credit may be earned by participating in the ASME student design competition.		
COURSE OBJECTIVES:	▪ Introduce students to the Mechanical Engineering discipline within the College of Engineering.(i) ▪ Introduce students to tools offered by the university that will help them in their academic career. ▪ Students will gain an appreciation of what Mechanical Engineering is about including specific areas of specialty associated with the field.(f) ▪ To provide students with a working knowledge of written and oral forms of communication used by engineers.(g) ▪ Introduce students to the faculty in the Mechanical Engineering department and the Engineering Deans office. ▪ Introduce students to the Mechanical Engineering student organizations and upper level students. ▪ Introduce students to the importance of working in groups and teams and give them experience with the design process.		
TOPICS COVERED:	▪ Mechanical Engineering Laboratory Tours ▪ Technical Communication		

		▪ Working in Teams ▪ Design Competition Activities ▪ Ethics ▪ Academic Program ▪ Using Web CT and other NMSU online programs
RELATIONSHIP PROGRAM OBJECTIVES:	**TO**	▪ Program Objective A – to prepare students for successful careers and lifelong learning ▪ Program Objective C – To develop skills pertinent to the design process, including students' ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively. ▪ Program Objective E – To instill in our students an understanding of their professional and ethical responsibilities..
RELATIONSHIP PRPOGRAM OUTCOMES	**TO**	(f)- understanding of professional and ethical responsibilities (g) - ability to communicate effectively (i) - recognition of need for, and ability to, engage in lifelong learning
CONTRIBUTION PROFESSIONAL COMPONENT:	**TO**	PC1 – major design experience PC3 – 1 ½ years of engineering topics
POLICIES:		▪ Class attendance will be taken at the beginning of every class. It is the student's responsibility to show up to class on time and sign the attendance sheet. (*Failure to sign the attendance sheet will result in an absent grade for that day*) ▪ Students with three consecutive unexcused absences will be dropped from the course. ▪ Homework assignments will be collected at the beginning of class. **Late homework** assignments will be accepted one up to one week. A **50% penalty** will be given to all late homework. ▪ Student participation in group assignments will be evaluated by group members. Failure to meet at times specified by the group or participate in group activities will result in a reduction of the student's course grade by one letter grade.
AUTHOR/DATE:		David Seigel 1/18/2006

	ME159 Graphical Communication and Design	**2 credits - required**	**Spring 2006**
Course Information			

INSTRUCTOR:	Ronald J. Pederson Office: JH117 Phone: 646-3501 Email: rpederso@nmsu.edu
ASSISTANTS:	To Be Announced
OFFICE HOURS:	Posted in ME Office
CATALOG DESCRIPTION:	Sketching and orthographic projection. Detail and assembly drawings, dimensioning, tolerance specification, and design projects.
PREREQUISITES:	Basic algebra and trigonometry
TEXT:	*Computer Aided Design with Unigraphics NX3*, H. Felix Lee and David W. Fulton, Kendall/Hunt Publishing, 2005. This is a **WebCT course** – Go to http://my.nmsu.edu and use NMSU Bookmarks WebCT ***OR*** use http://salsa.nmsu.edu directly in the browser
CLASS SCHEDULE:	Lecture: 1:30-2:20, Lab: 2:30 - 5:20 Tu or W Lab Hours : 8:00am – 5:00pm, Monday → Friday in Jett Hall 21 (Downstairs) 5:00pm – 11:00pm, Sunday → Thursday in Jett Hall 604 (Upstairs)
GRADES:	Quizzes 30% Exam 20% Lab Drawings/Homework/Project 50%
COURSE OBJECTIVES:	1. The student will become familiar with 3-D, featured based, parametric solids modeling as a design tool in mechanical engineering. (k) 2. The student will become familiar with the practices and procedures used to produce and read engineering working drawings. (k) 3. The student will become familiar with computers from an historical, software, and hardware perspective as they are used in mechanical engineering. 4. The student will become familiar with the general principles of computer aided design and drafting (CADD), and be reasonably proficient in the use of one modern CADD software package – Unigraphics NX3 from UGS Corporation. (k) 5. The student will work in a team environment to produce a set of engineering drawings for a small engineering assembly. (c)
TOPICS COVERED:	*Using Unigraphics NX3:* 1. Feature-based solids modeling – creation of basic and intermediate features 2. NX3 as a design tool - building design intent into models 3. Assembly modeling

4. Creating engineering drawings of parts and assemblies

Practices and Procedures Used to Produce Engineering Drawings:

1. Creating 2D orthographic drawings of 3D objects – standard views, required number, placement, etc.
2. Required drawing dimensions – identify features, decide how many dimensions, etc.
3. Good dimensioning practices – where paced in drawing? How should they look?
4. Reading engineering drawings – using 2D orthographic views and dimensions to infer 3D shape

RELATIONSHIP TO PROGRAM OBJECTIVES: A – to prepare students for successful careers and lifelong learning
C – to develop skills pertinent to the design process, including the students' ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively.

RELATIONSHIP TO PROGRAM OUTCOMES: c – ability to design a system, component, or process
k – ability to use techniques, skills and modern engineering tools for engineering practice.

CONTRIBUTION TO PROFESSIONAL COMPONENT: PC1 – major design experience
PC3 – 1 ½ years engineering topics (engineering science and design)

POLICIES:

1. Lab Drawings will be checked in class or handed in at the end of the laboratory sessions as noted in the Course Outline. Homework is due at the beginning of the next class lecture (1:30 PM). Lab drawings or Homework may be turned in LATE until 9:00 PM the following day with a 20% grade penalty. No Drawings or Homework will be accepted after that time.
2. Temporary storage space up to 50MB will be supplied for the semester in the two ME computer labs - JH 604 and JH 21 – free of charge. This space is usable for all of your courses – but it can fill up fast – keep it cleaned up by deleting unnecessary files or copying files to permanent storage. Permanent storage is the responsibility of the student; you can copy files that you want to keep to a USB drive, a CD-RW, or to floppy disks (JH 604 only).
3. Paper for printing up to 100 sheets in the semester will be supplied free of charge. Printing beyond that amount will be charged at the rate of 5¢/page (see secretary in JH 117).
4. **ALL** absences must be "excused", otherwise a **0** will be recorded for that Lecture/Lab Drawing. Talk/Email the instructor as soon as you know that you will miss the class. Because of limited space/machines, any make-up work must be coordinated with the instructor.

AUTHOR/DATE: R. Pederson
Spring/2006

Course Information	**ME 166 Introduction to Mechanical Engineering**	**2 credits - elective**	**Spring 2006**

INSTRUCTOR: Dr. Nadir Yilmaz Office: JH 613

Email: nadir@nmsu.edu

ASSISTANTS: TBA

OFFICE HOURS: 10:30 AM – 12:30 PM, MW

CATALOG DESCRIPTION: Introduction to mechanical engineering and the software tools used for communication and computation in engineering.

PREREQUISITES: None; Co-requisite: Math 191

TEXTBOOK: *Introduction to Mechanical Engineering* by Robert Rizza

CLASS SCHEDULE: 8:30 – 9:20 AM, MW, JH 604

GRADING:

Homework assignments:	35%
Exam 1 :	20%
Exam 2 :	20%
Final Exam:	25%

COURSE OBJECTIVES:

- Enhance potential for academic success (attitude, behavior, goals and organization).
- Become comfortable with the college's computing resources including e-mail, the Internet, Word, Excel, and MathCAD.
- Learn how to approach engineering problems with appropriate tools.

TOPICS COVERED:

- Mechanical Engineer Role.
- Tools (Internet, Word, Excel, Power Point, and MathCAD).
- Dimensions, Units, Conversions, etc.
- Error Analysis.
- Statics and Dynamics.
- Solid Mechanics.
- Fluids.
- Thermal Sciences.

RELATIONSHIP TO PROGRAM OBJECTIVES: Program Objective A – to prepare students for successful careers and lifelong learning
Program Objective B – to educate students thoroughly in engineering science and methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving

RELATIONSHIP TO PROGRAM OUTCOMES:
a – ability to apply knowledge of math, science, and engineering
d – ability to function on multi-disciplinary teams
f – understanding of professional and ethical responsibility
h – societal impact
i – recognition of need for, and ability to engage in lifelong learning

j – knowledge of contemporary issue

CONTRIBUTION TO PROFESSIONAL COMPONENT: PC3 – 1 ½ years engineering topics (engineering science and design)

POLICIES:

- Homework assignments must be turned in at the beginning of the class period when they are due. No late homework assignments will be accepted.
- Students cannot make up missed tests.
- Examination during the semester will be administered during the regular class period (50 minutes) and will be problem solving and short essay type.
- All examinations will be closed book, closed notes and closed neighbor. You will be allowed to use calculators, and a 5 X 7 note card with any information you would like to put. However, homework or any kind of problem solutions should not be written on the note card.
- The final examination will be comprehensive but will stress material not covered by previous examinations.
- Any form of cheating on any examination will result severe penalties (e.g., F in the course or expulsion from the university.

AUTHOR/DATE: N. Yilmaz 1/23/2006

Course Information	ME 236 Engineering Mechanics I	3 credits - required	Spring 2006
INSTRUCTOR:	Igor Sevostianov Email: igor@me.nmsu.edu	Office: JH 628	Phone: 646-3322
ASSISTANTS:	N/A		
OFFICE HOURS:	We 10:30-11:30 or by appointment		
CATALOG DESCRIPTION:	Force systems, resultants, equilibrium, distributed forces, area moments, friction, and kinematics of particles.		
PREREQUISITES:	MATH 192 Co requisite: PHYS 215		
TEXT:	*Engineering Mechanics, Statics* R.C. Hibbeler., 10-th ed Prentice Hall		
CLASS SCHEDULE:	Lecture 9:30 – 10:20, Mo, We, Fr JH 209		
GRADES:	Homeworks and Quizzes 15%; Test #1 15%; Test #2 20%; Test #3 20%; Final Exam 30%		
COURSE OBJECTIVES:	**After completing this course, a student should be able to:** • Determine resultants of concurrent force systems using both force triangle and component methods (a). • Apply equilibrium conditions to force systems (a). • Construct free body diagrams of particles, rigid bodies, and structures, and identify all external forces and moments acting on them (k). • Use principles of equilibrium to determine forces and moments acting on individual members of trusses, and other structures (k). • Apply concepts of friction to a variety of problems including ramps, sliding vs. tipping, wedges, and belts (e).		
TOPICS COVERED:	• Vectors • Particle equilibrium • Equivalent force systems • Rigid body equilibrium • Structural analysis • Centroids, distributed load systems, fluid pressure • Area and mass moments of inertia • Friction • Internal forces • Principle of wirtual work		

RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – to prepare students for successful careers and lifelong learning Program Objective B – to educate students thoroughly in engineering science and methods of analysis, including the mathematical and computational methods appropriate for engineers when solving problems. Program Objective C – to develop the skills pertinent to the design
RELATIONSHIP TO PROGRAM OUTCOMES	a - ability to apply knowledge of math, science, and engineering e – ability to identify, formulate and solve engineering problems j – ability to use techniques, skills and modern engineering tools for engineering practice
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC3 – 1 ½ years engineering topics (engineering science and design)
POLICIES:	• Overall grade for HW will be based on all assignments excluding the one with the worst grade. • Every student has the right to skip one HW assignment. However, having used this right, one cannot exclude the worst HW •
AUTHOR/DATE:	Igor Sevostianov 1/18/2006

Course Information	ME 237 Engineering Mechanics II	3 credits - required	Spring 2006
INSTRUCTOR:	J. Genin	Office: JH 110	Phone: 646-3809
	Email: jgenin@nmsu.edu		
ASSISTANTS:	TBA		
OFFICE HOURS:	M,W,F 9:30-11:00 or by appointment		
CATALOG DESCRIPTION:	Kinetics of particles, kinematics and kinetics of rigid bodies, systems of particles, energy and momentum principles, and kinetics of rigid bodies		
PREREQUISITES:	ME 236, Math 192; Co requisite: Math 291		
TEXT:	*Dynamics*, by Bedford and Fowler, 3rd edition, Prentice Hall		
CLASS SCHEDULE:	Lecture 12:30 – 1:20 pm, MWF, JH 203		
GRADES:	Homework: 15% Test1: 10% Test2: 15% Test3: 20%		Final Exam: 20%
COURSE OBJECTIVES:	• Understanding of Static and Dynamic Equilibrium • Proficiency in developing Mathematical Models (FBD's) • Understanding of the Kinematics and Kinetics of Particles • Understanding of Energy and Momentum Principles wrt Particles • Understanding of the Kinematics and Kinetics for Planar Motion of Rigid Bodies • Understanding of Energy and Momentum Principles for Planar Motion of Rigid Bodies • Understanding of the Kinematics and Kinetics for Three Dimensional Motion of Rigid Bodies		
TOPICS COVERED:	• Vector Algebra and Static Equilibrium • Kinematics and Kinetics, Energy and Momentum principles for Particles Rigid Bodies in Planar Motion Rigid Bodies in Three Dimensional Motion • Moments and Products of Inertia • Relative Motion and Moving Reference Frame		
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – to prepare students for successful careers and lifelong learning Program Objective B – to educate students thoroughly in methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving problems. Program Objective C – to develop skills pertinent to the design process,		
RELATIONSHIP TO PROGRAM OUTCOMES	a - ability to apply knowledge of math, science and engineering c - ability to design a system, component or process e – ability to identify, formulate and solve engineering problems		

	i – recognition of the need for, and ability to, engage in lifelong learning
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC# - 1 ½ years of engineering topics
POLICIES:	• Homework assignments must include: 1. problem description, 2. mathematical model(s), 3. formulation of solution, 4. presentation of mathematical procedures used, 5. results, and where appropriate, 6. analysis of results. • Late homework assignments will not be accepted. • Collaboration in the form of discussion of formulation of solutions or results is encouraged, however, each individual must work independently to create the required solutions to homework assignments. • Grades will be assigned on an absolute scale
AUTHOR/DATE:	J. Genin Spring 2006

Course Information	• **3 credits - required Spring 2006** **E 240** **Thermodynamics**
INSTRUCTOR:	Professor Harry Hardee Office: JH 113 Phone: 646-6608 Email: hardee@zianet.com
ASSISTANTS:	None
OFFICE HOURS:	Tue/Thur (except lecture hours) or by appointment
CATALOG DESCRIPTION:	First and Second Laws of Thermodynamics, irreversibility and availability, applications to pure substances and ideal gases.
PREREQUISITES:	PHYS 215
TEXT:	*Thermodynamics, An Engineering Approach, 4th Edition*, Yunus Cengel and Michael Boles, McGraw-Hill
CLASS SCHEDULE:	Tue/Thur 8:55 a.m. – 10:10 a.m. -- Jett Hall 209
GRADES:	Homework and Daily quizzes: 40% Exams: 40% Final Exam: 20%
COURSE OBJECTIVES:	• Students will learn to formulate and solve typical thermodynamic problems that arise in Mechanical Engineering (e) • Students will become familiar with thermodynamic devices and processes that occur in practical Mechanical Engineering applications. (e)
TOPICS COVERED:	• Basic Concepts of Thermodynamics • Properties of Pure Substances • Energy Transfer by Heat, Work, and Mass • The First Law of Thermodynamics • The Second Law of Thermodynamics • Entropy • Exergy • Vapor and Combined Power Cycles
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – To prepare students for successful careers and lifelong learning. Program Objective B – To educate students thoroughly in thermodynamic principles and methods of analysis for solving thermodynamic problems.
RELATIONSHIP TO PROGRAM OUTCOMES	a – ability to apply knowledge of math, science, and engineering e – ability to identify, formulate, and solve engineering problems g - ability to communicate effectively k – ability to use techniques, skills and modern engineering tools for engineering practice
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC3 – 1½ years engineering topics (engineering science and design)
RELATIONSHIP TO ABET SPECIFIC CRITERIA	ME2 – the ability to apply advanced mathematics through multivariate calculus and differential equations ME4 – the ability to work professionally in both thermal and mechanical

systems areas including the design and realization of such systems

POLICIES:

- Homework assignments should include: 1. problem statement, 2. problem assumptions (if appropriate), 3. problem solution, 4 comments or discussion of results (if appropriate).
- **LATE HOMEWORK WILL NOT BE ACCEPTED!**
- Collaboration in the form of discussion of formulation of solutions or results is encouraged, however, each individual must work independently to create the final homework solution.
- Grades will be approximately based on a normalized distribution curve (i.e. relative to computed class average).
- Attendance will be randomly checked and will be factored into the final course grade.
- Missed assignments or in-class quizzes are not excused and result in lost credit.
- Reasonable excuses are considered for missed class exams. All make-up exams are scheduled and given during the last week of the semester.
- Failure to attend the scheduled final exam will result in a course grade of I or F. (Note that the final exam is currently scheduled for Tuesday, May 3).
- During lecture, please turn off all cell phone ringers and pager buzzers so that the class is not disturbed by these devices.

AUTHOR/DATE: H. Hardee 1/1/06

Course Information	• E 260 Mechanical Engineering Problem Solving	3 credits - required	Spring 2006
INSTRUCTOR:	Gabe Garcia Office: JH104 Phone: 646-7749 email: gabegarc@nmsu.edu		
ASSISTANTS:	NA		
OFFICE HOURS:	10:00 a.m.-12:00 p.m. T Th 9:00 a.m.-11:00 a.m. MWF or by appointment		
CATALOG DESCRIPTION:	Evolution and application of computers and computer hardware/software. Development of problem-solving techniques, and their implementation and execution on the computer. (Satisfies general education computer science requirement.)		
PREREQUISITES:	Math 185		
TEXT:	*MATLAB Programming for Engineers, 3rd Ed., S. J. Chapman, Thomson, 2004*		
CLASS SCHEDULE:	TU TH 08:55 - 10:10 A.M. JH 604		
GRADES:	Homework: 20% Lab Work and Quizzes: 10% 4 Exams: 15% each, total 60% Two Projects: 5% each, total 10%		
COURSE OBJECTIVES:	1. Students will become familiar with Engineering Problem Solving and programming using MATLAB and MATHCAD software packages. 2. Students will learn how to develop solutions to problems by the divide and conquer strategy. (a) 3. Students will learn how to formulate algorithms and write programs to solve problems. (e)		
TOPICS COVERED:	1. Engineering Problem Solving 2. MATLAB Environment 3. MATHCAD Environment 4. MATLAB Functions 5. Linear Algebra and Matrices 6. Solutions to Systems of Linear Equations 7. Interpolation and Curve Fitting 8. Ordinary Differential Equations 9. Symbolic Mathematics using MATHCAD 10. Integration and Differentiation using MATHCAD 11. Special Topics		
RELATIONSHIP TO	A – to prepare students for successful careers and lifelong learning.		

PROGRAM OBJECTIVES:	B – to educate students thoroughly in engineering science and methods of analysis, including mathematical and computational methods
RELATIONSHIP TO PROGRAM OUTCOMES:	a – ability to apply knowledge of math, science, and engineering e – ability to identify, formulate, and solve engineering problems g – ability to communicate effectively k – ability to use techniques, skills and modern engineering tools for engineering practice
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC3 – 1 ½ years engineering topics (engineering science and design)
POLICIES:	1. All computer programs must be written in MATLAB or MATHCAD as instructed and well commented. 2. All computer program programs are to be emailed by 5:00 p.m. the day they are due. 3. No late homework will be accepted. 4. Collaboration in the form of discussion of formulation of solutions or results is encouraged, however, each individual must work independently to create the solution and computer programs. 5. Attendance will be checked each class period. Students who miss two consecutive class periods or continually miss class periods will be dropped from the course.
AUTHOR/DATE:	G. Garcia 01/11/06

Course Information	ME 326 Mechanical Design	3 credits - elective	Spring 2006
INSTRUCTOR:	Edgar Conley Email: econley@nmsu.edu	Office: JH 519	hone: 646-5698
ASSISTANTS:	James Sullivan		
OFFICE HOURS:	MWF 8:30 – 9:30 am, and by appointment		
CATALOG DESCRIPTION:	Design methodology and practice for mechanical engineers		
PREREQUISITES:	ME 237, CE 301		
TEXT:	None; notes and study materials provided		
CLASS SCHEDULE:	Class: MW 11:30 – 12:20 Lab: MWF 12:30 – 1:20		
GRADES:	Class participation: 10% Homework: 20% Design Projects: 50% Final Exam – open 'book' and notes: 20%		
COURSE OBJECTIVES:	• Major design experience (c) • Team working • Professional and Ethical Responsibilities (f) • Conduct experiments and analyze data (b)		
TOPICS COVERED:	• Design Methods • Case studies • Professional practice • Safety • Product liability		
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – to prepare students for successful careers and lifelong learning Program Objective B – to educate students thoroughly in methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving problems. Program Objective C – to develop skills pertinent to the design process,		
RELATIONSHIP TO PROGRAM OUTCOMES	b – ability to design and conduct experiments/analyze and interpret data c – ability to design a system, component, or process d – ability to function on multi-disciplinary teams f - understanding of professional and ethical responsibility e – ability to identify, formulate, and solve engineering problems h – broad education needed to understand impact in a global and societal context i – contemporary issues		
CONTRIBUTION TO PROFESSIONAL	PC1 – major design experience PC3 – 1 ½ years engineering topics (engineering science and design)		

COMPONENT:

POLICIES:

- No make up exam
- Late homework will be accepted up to one week tardy; a grade reduction factor of ½ will apply.
- Grades are based on the above schedule. If, at course end, your grade is midway between ranges, then it will be bumped up to the next higher level provided the following condition is met: all homework is completed and submitted on time.

AUTHOR/DATE: E. Conley Spring 2006

Course Information	• **3 credits - required Spring 2006** **E 328 Engineering Analysis I**
INSTRUCTOR:	Professor Harry Hardee Office: JH 113 Phone: 646-6608 Email: hhardee@nmsu.edu
ASSISTANTS:	
OFFICE HOURS:	Tu/Thur (except lecture hours) or by appointment
CATALOG DESCRIPTION:	Mathematical methods for exact and approximate solutions of engineering problems.
PREREQUISITES:	Math 392
TEXT:	*Advanced Engineering Mathematics, 8th Edition,* Erwin Kreyszig, John Wiley & Sons
CLASS SCHEDULE:	Tue/Thur -- 1:10 – 2:25 p.m. -- Jett Hall 203
GRADES:	Homework and Daily Quizes 40% , Exams 40%, Final Exam 20%
COURSE OBJECTIVES:	• Students will learn to formulate and solve typical analytical problems that arise in Mechanical Engineering (e) • Students will become familiar with special mathematical functions that arise in the solution of Mechanical Engineering problems (a)
TOPICS COVERED:	• Ordinary Differential Equations • Bessel and Legendre Functions • Fourier Series • Partial Differential Equations • Special Mathematical Functions • Laplace Transform Methods • Fourier Transform Methods • Integral Equations • Linear Algebra • Approximate Methods of Analysis
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – To prepare students for successful careers and lifelong learning. Program Objective B – To educate students thoroughly in methods of analysis, including mathematical and computational methods appropriate for engineers to use when solving problems. Program Objective D – To teach students to use modern experimental and data analysis techniques.
RELATIONSHIP TO PROGRAM OUTCOMES	a- ability to apply knowledge of math, science and engineering e – ability to identify, formulate, and solve engineering problems
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC2 – 1 year math and basic science

RELATIONSHIP TO ABET SPECIFIC CRITERIA	ME2 – the ability to apply advanced mathematics through multivariate calculus and differential equations ME3 – familiarity with statistics and linear algebra
POLICIES:	• **HOMEWORK ASSIGNMENTS MUST BE SUBMITTED IN A NEAT AND CLEAR FORMAT**. • **LATE HOMEWORK WILL NOT BE ACCEPTED!** • Collaboration in the form of discussion of formulation of solutions or results is encouraged, however, each individual must work independently to create the final homework solution. • Grades will be based on a distribution relative to a computed class average. • Attendance will be randomly checked and will be factored into the final course grade. • Missed assignments or in-class quizzes are not excused and result in lost credit. • Reasonable excuses are considered for missed exams. All make-up exams are scheduled and given during the last week of the semester. • Failure to attend the scheduled final exam will result in a course grade of I or F. (Note that the final exam is currently scheduled for Thursday, December 9). • During lecture, please turn off all cell phone ringers and pager buzzers so that these devices do not disturb the class.
AUTHOR/DATE:	H. Hardee Spring 2006

Course Information	• E 329 Engineering Analysis II	3 credits - required	Spring 2006
INSTRUCTOR:	Ian H. Leslie Office: JH112 Phone: 646-2335 Email: ileslie@nmsu.edu		
ASSISTANTS:	none		
OFFICE HOURS:	See posting on office door.		
CATALOG DESCRIPTION:	Numerical methods for roots of linear and nonlinear equations, numerical integration, and solution of ordinary differential equations with emphasis on software design and engineering applications.		
PREREQUISITES:	Math 392 and ME 260		
TEXT:	*Applied Numerical Methods with Matlab, by* Steven C. Chapra		
CLASS SCHEDULE:	TuTh 1:10 – 2:25 PM		
GRADES:	Homework and Projects 70% , Quizzes 30%		
COURSE OBJECTIVES:	• Students will learn a variety of numerical methods that are useful in both basic and advanced engineering calculations. (a, e) • Students will develop an appreciation for the hazards and limitations of numerical solutions, including accuracy, stability, and computer limitations of memory and speed. (e, k) • Students will learn the basics of Matlab. (k)		
TOPICS COVERED:	• Roots of Equations • Linear systems of equations • Non Linear systems of equations • Interpolation and Curve fitting • Numerical differentiation and integration • Solution of Ordinary differential equations • Solution of Partial differential equations		
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – To prepare students for successful careers and lifelong learning. Program Objective B – To educate students thoroughly in methods of analysis, including mathematical and computational methods appropriate for engineers to use when solving problems.		
RELATIONSHIP TO PROGRAM OUTCOMES:	a – ability to apply knowledge of math, science, and engineering e – ability to identify, formulate, and solve engineering problems k – ability to use techniques, skills and modern engineering tools for engineering practice		
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC2 – 1 year math and basic science		
POLICIES:	• Homework assignments must be turned in on time for full credit.		

	• Homework will be accepted up to one day late with a 30% penalty. • Students must do their own work on each assignment, with the exception of seeking help from the instructor. Students may, however, get help on Matlab syntax and usage from anyone. • Grades may be curved but the instructor makes **no** commitment to do so.
AUTHOR/DATE:	I. H. Leslie 2/22/2006

Course Information	• **E 332 Vibrations**	**3 credits -elective**	**Spring 2006**
INSTRUCTOR:	Professor Genin Office: JH 110 Phone: 646-3809 Email: jgenin@nmsu.edu		
ASSISTANTS:	NA		
OFFICE HOURS:	1:30 - 2:30 p.m. M,T,W,Th,F or by appointment		
CATALOG DESCRIPTION:	Vibration of single and n-degree of freedom systems considering free, forced, and damped motion. Lagrange's equations. Dynamic stability. Controls. Matrix iteration.		
PREREQUISITES:	ME 237		
TEXT:	Vibrations, Thomson and class notes		
CLASS SCHEDULE:	08:30-9:30 MWF Jett Hall 103		
GRADES:	Homework 40%, Tests 60%		
COURSE OBJECTIVES:	• To be able to model vibrations problems using (a) free body diagrams, (b) Lagranges equations. • To be able to linearize the equations of motion. • To develop solutions to linear vibration systems using applied mathematics. (e) • To interpret the results of a linear analysis.		

TOPICS COVERED:	• Free Vibrations
	• Harmonic Motion
	• Undamped and Damped Systems
	• Energy Methods
	• Harmonic Excitation
	• Forced Vibration
	  • Impulse
	  • Arbitrary Input
	  • Periodic Input
	• Multiple-Degree-of-Freedom Systems
	• Distributed-Parameter Systems
	• Vibration Testing and Experimental Modal Analysis		

RELATIONSHIP TO PROGRAM OBJECTIVES:	Objective A - To prepare students for successful careers and lifelong learning. Objective B - To educate students in methods of analysis, including the mathematical and computational methods appropriate for engineers to employ in problem solving. Objective C - To develop skills pertinent to the design process,		

	including the student's ability to formulate problems, to think creatively, to communicate effectively, and to synthesize information and to work collaboratively.
RELATIONSHIP TO PROGRAM OUTCOMES	(c) – ability to design a system, component or process (h) – societal impact (i) – contemporary knowledge Vibrations is essential knowledge in the design of mechanical systems, be they toasters or airplanes
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC3 – 1 ½ years of engineering topics It is an essential skill which builds upon the student's dynamics, elasticity and materials background.
RELATIONSHIP TO ABET SPECIFIC CRITERIA	• ME2 – the ability to apply advanced mathematics through multivariate calculus and differential equations • ME3 – familiarity with statistics and linear algebra (This is not a required undergraduate course in all curricular. However it should be made available to those who wish it.)
POLICIES:	• Homework assignments must include: 1. problem description, 2. mathematical model(s), 3. formulation of solution, 4.presentation of mathematical procedures used, 5. results, and where appropriate, 6. analysis of results. • Late homework assignments will not be accepted. • Collaboration in the form of discussion of formulation of solutions or results is encouraged. However, each individual must work independently to create the required solutions to homework assignments. Grades will be assigned on an absolute scale.
AUTHOR/DATE:	Genin 1-15-06

Course Information	ME 333 Intermediate Dynamics	3 credits - required	Spring 2006
INSTRUCTOR:	J. Genin Email: jgenin@nmsu.edu	Office: JH 110	Phone: 646-3809
ASSISTANTS:			
OFFICE HOURS:	MWF 1:00 – 2:00, or by appointment		
CATALOG DESCRIPTION:	Three dimensional kinematics and kinetics, orbital motion, Lagrange's equations, dynamic stability, and controls.		
PREREQUISITES:	ME 237 or consent of instructor		
TEXT:	Website—http://me.nmsu.edu/~jgenin		
CLASS SCHEDULE:	MWF 8:30 – 9:20		
GRADES:	Homework: 40% 3 tests: 60%		
COURSE OBJECTIVES:	• Understanding of Kinematics of Rigid Bodies • Understanding of Dynamic Equilibrium of Rigid Bodies • Proficiency in developing Mathematical Models using a) free body diagrams, b) Lagrange's equations (c) • Ability to use knowledge acquired above to formulate, solve and		
TOPICS COVERED:	• Kinematics and Kinetics of Particles and Planar Rigid Bodies using moving reference frames, featuring Cartesian Coordinates, Path Variables, Cylindrical Coordinates • Kinematics of three dimensional bodies • Kinetic descriptions considering: Equations of Motion, Work-Energy, Linear Impulse-Momentum, Angular Impulse-Momentum Mass Moments and Products of Inertia Langrange's Equations Dynamic Stability Nonholonomic Systems Vibrations, Single degree of freedom Free, Forced, Damped Vibrations, Multi-degrees of freedom Free, Forced, Damped		
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – to prepare students for successful careers and lifelong learning Program Objective B – to educate students thoroughly in methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving problems. Program Objective C: to develop skills pertinent to the design process,		
RELATIONSHIP TO PROGRAM OUTCOMES	a- ability to apply knowledge of math, science and engineering c – ability to design a system, component or process e – ability to identify, formulate and solve engineering problems		

	i – recognition of the need for, and ability to, engage in lifelong learning
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC3 1 ½ years of engineering topics
POLICIES:	• Homework assignments are due at the beginning of class. • Late homework assignments will not be accepted. • Students cannot make up missed tests.
AUTHOR/DATE:	J. Genin Spring 2006

Course Information	ME 338 Fluid Mechanics	3 credits - required	Spring 2006
INSTRUCTOR:	J. Allen Email: jallen@nmsu.edu	Office: JH 614	Phone: 646-6546
ASSISTANTS:			
OFFICE HOURS:	M, W 2:30 – 4:00 p.m.		
CATALOG DESCRIPTION:	Properties of fluids. Fluid statics and fluid dynamics. Applications of the conservation equations – continuity, energy, and momentum – to		
PREREQUISITES:	ME 237; Co requisite: CE 301, ME 328		
TEXT:	*Fundamentals of Fluid Dynamics*, B.R. Munson, D.F. Young and T.H. Okiishi, Wiley, 5th edition, 2002		
CLASS SCHEDULE:	Lecture 10:30 – 11:20 am, MWF, JH 209		
GRADES:	Homework:34%; Quizzes: 33%; Final: 33%		
COURSE OBJECTIVES:	Develop a basic proficiency in 1. Ability to analyze hydrostatic loading problems (a,e). 2. Applications of mass, momentum and energy conservation laws to fluid mechanics problems (a,e). 3. Applications of dimensional analysis and dynamic similitude (b,e). 4. Development of understanding of empirical formulations for internal and external flows (c,e).		
TOPICS COVERED:	Fluid Statics Bernoulli's Equation & Fluid Dynamics Integral Approach and Control Volumes Dimensional Analysis Internal Flow – Pipe Flows External Flows		
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective B – to educate students thoroughly in methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving problems. Program Objective C – to develop the skills pertinent to the design process, including the students' ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively.		
RELATIONSHIP TO PROGRAM OUTCOMES	a – ability to apply knowledge of math, science, and engineering b - ability to design and conduct experiments/analyze and interpret data c – ability to design a system, component or process e – ability to identify, formulate and solve engineering problems		

CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC2 – 1 year math and basic science PC3 – 1 ½ years of engineering topics (engineering science and design)
POLICIES:	Final grades will be determined using the following grading scale: A=85-100, B=70-84, C=60-69, D=50-59, F=<50. Graded material will include homework, two exams, and a comprehensive final. Absence from graded classroom activities will result in a grade of zero on that exam, unless student informs instructor before the exam and produces a valid document of absence
AUTHOR/DATE:	J. Allen Spring 2006

Course Information	ME 341 Heat Transfer	3 credits - required	Spring 2006
INSTRUCTOR:	Ian H. Leslie Office: JH 112 Phone: 646-2335 Email: ileslie@nmsu.edu		
ASSISTANTS:	Ravi Purandare		
OFFICE HOURS:	See posting on office door.		
CATALOG DESCRIPTION:	Fundamentals of conduction, convection, and radiation. Design of heat transfer systems.		
PREREQUISITES:	Thermodynamics (ME240) & Engineering Analysis (ME328)		
TEXT:	*Fundamentals of Heat and Mass Transfer, 5th Ed.*, Incropera & DeWitt, John Wiley		
CLASS SCHEDULE:	Lectures are Tu Th 8:55 – 10:10, Room 103 EC2		
GRADES:	Homework 20%, 4 Exams worth 20% each, Last exam is comprehensive.		
COURSE OBJECTIVES:	• Student will become familiar with the basic concepts of conduction, convection and radiation heat transfer. (a) • Student will learn how to apply the First Law to a variety of heat transfer problems.(a, e, k) • Student will develop the ability to simplify problems and assess the validity of the simplfying assumptions that were made. (e)		
TOPICS COVERED:	• Application of the Fiirst Law in heat transfer. • Fourier's Law of conduction. • Analytical solution of 1-D conduction problems. • Numerical solution of multidimensional conduction problems (steady-state and transient). • Fundamentals of convection. • Solution of external convection problems (steady-state). • Solution of internal flow problems (steady-state). • Basic heat exchanger theory and problem solution. • Basic electromagnetic radiation theory. • Black and gray-body radiation exchange heat transfer.		
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective B - to educate students thoroughly in methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving problems.		
RELATIONSHIP TO PROGRAM OUTCOMES:	a – ability to apply knowledge of math, science, and engineering e – ability to identify, formulate, and solve engineering problems k – ability to use techniques, skills and modern engineering tools for engineering practice		
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC3 – 1 ½ years engineering topics (engineering science and design)		

POLICIES:	• Late homework will not be accepted without prior approval. • It is the responsibility of the student to check the course web site regularly. Since NMSU provides access to the internet it is not necessary to own a computer. • The student is expected to attend every class meeting. • There are no makeup exams without specific prior approval. • There is no extra work during, or after, the semester ends in order to bring up a grade. • Cheating may be prosecuted, and will have consequences. • The instructor reserves the right to alter the class schedule. Absence from class is not an excuse since notices of change will be posted on the course web site. • The instructor, above all else, wishes for every student to do well in the course.
AUTHOR/DATE:	Ian H. Leslie Spring 2006

Course Information	**ME 425 Design of Machine Elements**	**3 credits - elective**	**Spring 2006**
Instructor:	Phillip R. Smith	Office: JH 629	Phone: 646-2118
	Email: phsmith@nmsu.edu		
ASSISTANT:	N/A		
OFFICE HOURS:	8:00-9:00 M, Tu, W, Th or by appointment		
TEXT:	*Fundamentals of Machine Component Design* R.C. Juvinall and K.M. Marshek, 4th ed. Wiley		
CLASS SCHEDULE:	Lecture 10:20-11:35, Tu. Th. JH 204		
GRADES:	Homework: 16.7%; Quizzes: 16.7%; Three 1hr. 15min. Exams: 50%; Design Project: 16.7% All exam scores are normalized.		
COURSE OBJECTIVES	**Upon completion of the course, a student should be able to:** • Perform load analyses on machine element parts and assemblies (a). • Perform stress and strain analyses on machine elements and determine element deflections and stability (a,e,k). • Utilize standard failure theories and fatigue analysis to develop safety factors and reliability for machine elements (f,i,k). • Select materials for particular machine elements and machine element assemblies (e,i). • Design machine elements and machine element assemblies (c,k). • Work effectively as part of a design team (c,g).		
TOPICS COVERED:	• Load analysis • Materials • Stresses and strains • Deflections and stability • Standard failure theories and fatigue analysis • Threaded fasteners and power screws • Springs, • Bearings, gears, and shafts		
RELATIONSHIP TO PROGRAM OBJECTIVES:	Program Objective A – to prepare students for successful careers and lifelong learning Program Objective B – to educate students thoroughly in engineering science and methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving problems Program Objective C – to develop the skills pertinent to the design process, including the student's ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively		

	Program Objective E – to instill in our students an understanding of their professional and ethical responsibilities
RELATIONSHIP TO PROGRAM OUTCOMES:	a – ability to apply knowledge of math, science and engineering c – ability to design a system, component, or process e – ability to identify, formulate, and solve engineering problems h – societal impact j – contemporary issues k – ability to use techniques, skills and modern engineering tools for engineering practice
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC3 1 1/2 years of engineering topics (engineering science and design)
HOMEWORKS POLICIES:	• All homework is due the period following its assignment. • Homework can be up to one week late, but all late homework grades will be reduced by 50%.
AUTHOR/DATE:	Phillip R. Smith 4/19/2006

Course Information	ME 426/427 Design Project Laboratory I/II	6 credits - required	Spring 2006
INSTRUCTOR:	Young H. Park Office: JH 615 Phone: 646-3092 Email: ypark@nmsu.edu		
ASSISTANTS:	To be announced		
OFFICE HOURS:	8:00 – 9:00 am, M, Tu, W, Th, F, and by appointment		
CATALOG DESCRIPTION:	Students address a design problem in which innovation and attention to detail are emphasized. Solution of the problem entails applications of mechanics and/or the thermal sciences.		
PREREQUISITES:	ME 326, ME341, ME 338, ME 425(co-requisite)		
TEXT:			
CLASS SCHEDULE:	3:30 – 6:20 pm, MW, JH 283		
GRADES:	Class Participation: 20% Meeting Participation: 10% Class Assignments: 10% Design Project: 60%		
COURSE OBJECTIVES:	• Have experience functioning as mechanical engineer within an engineering design and development group. (d) • Complete a real-life design task – transform a client's needs into a tangible, tractable project definition, and see the project through to completion. (c) • Understand and use a formal engineering design method, with emphasis on building concurrent engineering procedures into the basic design method. (c) • Become proficient in preparing and reviewing formal technical data package related to an engineering design including written progress reports, oral presentations, and final design package and report (g)		
TOPICS COVERED:	• Participation in a project team • Use of technical tools from past engineering courses • Strengthening of teaming skills • Learning how to apply engineering fundamentals to the design		
RELATIONSHIP TO PROGRAM OBJECTIVES:	A – to prepare students for successful careers and lifelong learning C – to develop skills pertinent to the design process, including the students' ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively.		

RELATIONSHIP TO PROGRAM OUTCOMES:	c- ability to design a system, component, or process d- ability to function on multi-disciplinary teams g- ability to communicate effectively
CONTRIBUTION TO PROFESSIONAL COMPONENT:	PC1 – major design experience PC3 – 1 ½ years engineering topics (engineering science and design)
POLICIES:	
AUTHOR/DATE:	Young Park Spring 2006

Course Information	**ME 449 Senior Seminar** **1 credit - required** **Spring 2006**
INSTRUCTOR	E. Conley JH 519 646-5698 E-mail: econley@nmsu.edu
OFFICE HOURS	MWF 8:30 – 9:30
CATALOG DESCRIPTION	Senior seminar covering topics relevant to graduating mechanical engineering seniors (job placement, interviewing techniques, resume preparation
PREREQUISITES	Senior standing
TEXT	None
SCHEDULE	Friday 11:30 – 12:20
GRADES	• Homework 30% • Participation 70% (required attendance) • Homework is due at the beginning of class unless otherwise indicated. Late homework will be accepted up to one week late – a grade reduction factor of ½ will apply. • Standard grading system: A 100-90; B 89-80; C 79–70, etc.
COURSE OBJECTIVES	• Prepare for the job search and or graduate school. (i) • Establish the bounds of professional conduct in the workplace. (f) • Prepare for financial obligations and opportunities. (j)
RELATIONSHIP TO PROGRAM OBJECTIVES	Program Objective A - Prepare students for a successful professional career, and for lifelong learning. Program Objective E – to instill in our students an understanding of their professional and ethical responsibilities
RELATIONSHIP TO PROGRAM OUTCOMES	f – understanding of professional and ethical responsibility g – ability to communicate effectively i – recognition of the need for, and ability to engage in lifelong learning j – knowledge of contemporary issues
CONTRIBUTION TO PROFESSIONAL COMPONENT	NA
AUTHOR/DATE:	E. Conley Spring 2006