- Course Codes
  - Code: MAE
    Number: 305
    Subletter:
    Home Dept?: Y
  - Code: MAT
    Number: 301
    Subletter:
    Home Dept?: N

Title: Mathematics in Engineering I
Topic:
Subletter:
Description: A treatment of the theory of differential equations. The objective is to provide the student with an ability to solve standard problems in this field.
Max. Enrollment: 120
May PDF?: N
May Audit?: N
Assignments:
Website:
Final Exam Type: Final
Grading
Sample Reading List
- Author Name: Boyce & DiPrima
  Title: Elementary Differential Equations & Boundary Value Problems

Sections
- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 120
  SCORE Number: 20079
  Meetings
  - Beg. Time: 11:00:00
    End Time: 11:50:00
    Place: BOWEN 222
    Days
    - Day: M
    - Day: W
    - Day: F

    TBA?: N
  Instructors
  - First: Morton
    Middle: Daniel
    Last: Kostin
  - First: Zheng
    Middle:
    Last: Chen
  - First: Raghavendra
    Middle: Pradeep
    Last: Kukillaya
  - First: Zhanhua
    Middle:
    Last: Ma

- Course Codes
  - Code: MAE
    Number: 221
    Subletter:
    Home Dept?: Y

Title: Thermodynamics
Topic:
Subletter:
Description: Heat and work in physical systems. Concepts of energy conversion and entropy, primarily from a macroscopic viewpoint. Thermodynamic potentials and chemical equilibrium. Applications to engines, heat pumps, and fuel cells. In the laboratory, students will carry out experiments in the fields of analog electronics and thermodynamics. FOR MAE CONCENTRATORS ONLY, a combined laboratory grade will be issued in the spring laboratory course MAE 224, which includes the laboratory work of both MAE 221 and MAE 224.
Max. Enrollment: 60
May PDF?: N
May Audit?: N
Assignments: Weekly reading assignments and problem sets, about 9 hours per week.

- Website
- Final Exam Type: Final
- Grading
  - Perc.: 20
    - Type: MidTerm Exam
  - Perc.: 40
    - Type: Final Exam
  - Perc.: 40
    - Type: Problem Set(s)
- Sample Reading List
  - Author Name: Moran & Shapiro
    - Title: Fundamentals of Engineering Thermodynamics, 5th Ed.
- Sections
  - Format: B
    - Number: 01
    - Status: O
    - Max. Enrollment: 12
    - SCORE Number: 20059
    - Meetings
      - Beg. Time: 13:30:00
        - End Time: 16:20:00
        - Place: EQUAJ J209
        - Days
          - Day: M
        - TBA?: N
    - Instructors
      - First: Michael
        - Middle:
        - Last: Vocaturo
      - First: Syed
        - Middle: Sohail Hamid
        - Last: Zaidi
      - First: Grunde
        - Middle:
        - Last: Jomaas
  - Format: B
    - Number: 02
    - Status: X
    - Max. Enrollment: 12
    - SCORE Number: 20060
    - Meetings
      - Beg. Time: 13:30:00
        - End Time: 16:20:00
        - Place: EQUAJ J209
        - Days
          - Day: T
        - TBA?: N
    - Instructors
      - First: Michael
        - Middle:
        - Last: Vocaturo
      - First: Syed
        - Middle: Sohail Hamid
        - Last: Zaidi
      - First: Grunde
        - Middle:
        - Last: Jomaas

- Format: B
  Number: 03
  Status: O
  Max. Enrollment: 12
  SCORE Number: 20061
  Meetings
  - Beg. Time: 13:30:00
    End Time: 16:20:00
    Place: EQUAJ J209
    Days
    - Day: W
    TBA?: N
  Instructors
  - First: Michael
    Middle:
    Last: Vocaturo
  - First: Syed
    Middle: Sohail Hamid
    Last: Zaidi
  - First: Emanuel
    Middle: Solomon
    Last: Stockman
- Format: B
  Number: 04
  Status: O
  Max. Enrollment: 12
  SCORE Number: 20062
  Meetings
  - Beg. Time: 13:30:00
    End Time: 16:20:00
    Place: EQUAJ J209
    Days
    - Day: Th
    TBA?: N
  Instructors
  - First: Michael
    Middle:
    Last: Vocaturo
  - First: Syed
    Middle: Sohail Hamid
    Last: Zaidi
  - First: Chun-Wei
    Middle:
    Last: Pao
- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 60
  SCORE Number: 20063
  Meetings
  - Beg. Time: 10:00:00
    End Time: 10:50:00
    Place: FRIEN 004
    Days
    - Day: M
    - Day: W
    - Day: F
    TBA?: N
  Instructors
  - First: Daniel
    Middle: Mark
    Last: Nosenchuck

- Format: C
  Number: 01
  Status: O
  Max. Enrollment: 50
  SCORE Number: 20064
  Meetings
  - Beg. Time: 12:30:00
    End Time: 13:20:00
    Place: EQUAD D221
    Days
    - Day: M
    TBA?: N
  Instructors
  - First: Daniel
    Middle: Mark
    Last: Nosenchuck
  - First: Syed
    Middle: Sohail Hamid
    Last: Zaidi

- Course Codes
  - Code: MAE
    Number: 223
    Subletter:
    Home Dept?: Y
  - Code: CEE
    Number: 323
    Subletter:
    Home Dept?: N

Title	Modern Solid Mechanics
Topic	
Subletter	
Description	Fundamental principles of solid mechanics: equilibrium equations, reactions, internal forces, stress, strain, Hooke's law, torsion, beam bending and deflection, and analysis of stress and deformation in simple structures. Integrates aspects of solid mechanics that have applications to mechanical and aerospace structures (engines and wings), as well as to microelectronic and biomedical devices (thin films and artificial hearts). Topics include stress concentration, fracture, plasticity, fatigue, visco-elasticity and thermal expansion. The course synthesizes descriptive observations, mathematical theories, and engineering consequences.
Max. Enrollment	60
May PDF?	Y
May Audit?	Y
Assignments	Weekly homework assignments, accounts for 30% of the final grade. Weekly quizzes, accounts for 5% of the final grade.
Website	
Final Exam Type	Final

Grading

- Perc.: 25
  Type: MidTerm Exam
- Perc.: 40
  Type: Final Exam
- Perc.: 5
  Type: Quizzes
- Perc.: 30
  Type: Problem Set(s)

Sample Reading List

- Author Name: E.J. Hearn
  Title: Mechanics of Materials, Volumes 1 & 2 (Pergamon)
- Author Name: J.P. Den Hartog
  Title: Mechanics (Dover)

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 60
  SCORE Number: 20080

  Meetings

  - Beg. Time: 11:00:00
    End Time: 12:20:00
    Place: EQUAD D221

    Days

    - Day: T
    - Day: Th

    TBA?: N

  Instructors

  - First: Mikko
    Middle: Petteri
    Last: Haataja
  - First: Yong
    Middle:
    Last: Yang

- Course Codes
  - Code: MAE
    Number: 331
    Subletter:
    Home Dept?: Y

Title: Aircraft Flight Dynamics
Topic:
Subletter:
Description: Introduction to the performance, stability, and control of aircraft. Fundamentals of configuration aerodynamics. Methods for analyzing the dynamics of physical systems. Characterization of modes of motion and desirable flying qualities. Case studies in aircraft stability and control.
Max. Enrollment: 60
May PDF?: N
May Audit?: N
Assignments: Mix of problem sets and short projects.
Website:
Final Exam Type: Final

Grading

- Perc.: 20
  Type: MidTerm Exam
- Perc.: 35
  Type: Final Exam
- Perc.: 10
  Type: Precept Participation
- Perc.: 35
  Type: Problem Set(s)

Sample Reading List

- Author Name: R. Stengel
  Title: Flight Dynamics, Princeton University Press, 2004
- Author Name: M.J. Abzug and E.E. Larrabee
  Title: Airplane Stability and Control

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 60
  SCORE Number: 20081

  Meetings

  - Beg. Time: 15:00:00
    End Time: 16:20:00
    Place: EQUAD D221

    Days

    - Day: T
    - Day: Th

    TBA?: N

  Instructors

  - First: Ellen
    Middle: Meredith
    Last: Taylor
  - First: Robert
    Middle: Frank
    Last: Stengel
  - First: Milos
    Middle:
    Last: Ilak
  - First: Sunil
    Middle: Doulatram
    Last: Ahuja

- Format: P
  Number: 01
  Status: X
  Max. Enrollment: 60
  SCORE Number: 22359

  Meetings

  Instructors

- Course Codes

- Code: MAE
  Number: 321
  Subletter:
  Home Dept?: Y

Title	Engineering Design
Topic	
Subletter	
Description	Focus on engineering fundamentals, design processes and procedures. Course covers materials selection and design, machine design and innovation, and design and manufacture for a global environment. Parametric-design and finite-element simulation techniques are introduced in the computer-design laboratory. Instruction in basic and computer-based fabrication and prototyping methods is given in the manufacturing laboratory. Teams of students conduct design projects which involve the complete design cycle from concept and fundamental engineering through optimization, prototype, and test. Description continued in Other Information.
Max. Enrollment	59
May PDF?	N
May Audit?	N
Assignments	Reading from references and notes. One major project. Lab reports and problem sets. Mid-term exam. The project will involve design concepts, component and system design, construction and device fabrication.
Website	
Final Exam Type	Take-Home

Grading

- Perc. 25
  Type: MidTerm Exam
- Perc. 25
  Type: Design Project(s)
- Perc. 25
  Type: Take Home Final Exam
- Perc. 10
  Type: Lab Reports
- Perc. 15
  Type: Problem Set(s)

Sample Reading List

- Author Name: Shigley and Mische
  Title: Mechanical Engineering Design
- Author Name: M.F. Ashby
  Title: Materials Selection in Mechanical Design

Sections

- Format: B
  Number: 01
  Status: X
  Max. Enrollment: 15
  SCORE Number: 20065

  Meetings

  - Beg. Time: 13:30:00
    End Time: 16:20:00
    Place: EQUAC C119

    Days

    - Day: M

    TBA?: N

  Instructors

  - First: Glenn
    Middle: Arther
    Last: Northey
  - First: Guoguang
    Middle:
    Last: Fu

- Format: B
  Number: 02
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20066
  Meetings
  - Beg. Time: 13:30:00
    End Time: 16:20:00
    Place: EQUAC C119
    Days
    - Day: T
    TBA?: N
  Instructors
  - First: Glenn
    Middle: Arther
    Last: Northey
  - First: Jianbo
    Middle:
    Last: Chen
- Format: B
  Number: 03
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20067
  Meetings
  - Beg. Time: 13:30:00
    End Time: 16:20:00
    Place: EQUAC C119
    Days
    - Day: W
    TBA?: N
  Instructors
  - First: Glenn
    Middle: Arther
    Last: Northey
  - First: Jun
    Middle:
    Last: Song
- Format: B
  Number: 04
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20068
  Meetings
  - Beg. Time: 13:30:00
    End Time: 16:20:00
    Place: EQUAC C119
    Days
    - Day: Th
    TBA?: N
  Instructors
  - First: Glenn
    Middle: Arther
    Last: Northey

- Format: B
  Number: 05
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20069
  Meetings
  - Beg. Time: 13:30:00
    End Time: 16:20:00
    Place: EQUAC C119
    Days
    - Day: F
    TBA?: N
  Instructors
  - First: Glenn
    Middle: Arther
    Last: Northey

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 59
  SCORE Number: 20070
  Meetings
  - Beg. Time: 11:00:00
    End Time: 12:20:00
    Place: FRIEN 004
    Days
    - Day: T
    - Day: Th
    TBA?: N
  Instructors
  - First: Winston
    Middle: Oluwole
    Last: Soboyejo

- Course Codes
  - Code: MAE
    Number: 324
    Subletter:
    Home Dept?: Y

Title: Structure and Properties of Materials
Topic:
Subletter:
Description: Provides the materials background needed to satisfy the department requirement in this area. Relates properties of metals, alloys, polymers, composite materials, semiconductors, and ceramics to their atomic level and microscopic structure. Relates special materials properties to their exploitation in advanced technology and will illustrate this with specific examples.
Max. Enrollment: 55
May PDF?: Y
May Audit?: Y
Assignments: Weekly problem sets, question cards, and reading in reference texts.
Website:
Final Exam Type: Final

Grading

- Perc.: 20
  Type: MidTerm Exam
- Perc.: 40
  Type: Final Exam
- Perc.: 20
  Type: Other Exam
- Perc.: 5
  Type: Precept Participation
- Perc.: 15
  Type: Problem Set(s)

Sample Reading List

- Author Name: Callister
  Title: Materials Science & Engineering

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 55
  SCORE Number: 20082

  Meetings

  - Beg. Time: 13:30:00
    End Time: 14:50:00
    Place: EQUAD D221

    Days

    - Day: T
    - Day: Th

    TBA?: N

  Instructors

  - First: Emily
    Middle: Ann
    Last: Carter

- Format: P
  Number: 01
  Status: X
  Max. Enrollment: 55
  SCORE Number: 20083

  Meetings

  - Beg. Time: 12:30:00
    End Time: 13:20:00
    Place: EQUAD D221

    Days

    - Day: Th

    TBA?: N

  Instructors

  - First: Srevatsan
    Middle:
    Last: Muralidharan

- Course Codes

Code	MAE
Number	335
Subletter	
Home Dept?	Y
Title	Fluid Dynamics
Topic	
Subletter	
Description	The first half of the course deals with one-dimensional compressible flows, with special emphasis on jet propulsion applications. The second half of the course deals with aerodynamics of two and three-dimensional wings and bodies, concepts of thrust, lift and drag (frictional and lift-induced). Homework will include design problems and computational examples.
Max. Enrollment	50
May PDF?	Y
May Audit?	Y
Assignments	Reading 30-40 pages of text. Weekly problem sets.
Website	
Final Exam Type	Final

Grading

Perc.	30
Type	MidTerm Exam
Perc.	40
Type	Final Exam
Perc.	30
Type	Problem Set(s)

Sample Reading List

Author Name	Anderson
Title	Fundamentals of Aerodynamics
Author Name	Kuethe & Chow
Title	Foundations of Aerodynamics
Author Name	Smits
Title	A Physical Introduction to Fluid Mechanics
Author Name	Liepmann and Roshko
Title	Elements of Gas Dynamics

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 50
  SCORE Number: 20071
  Meetings
  - Beg. Time: 10:00:00
    End Time: 10:50:00
    Place: EQUAD D221
    Days
    - Day: M
    - Day: W
    - Day: F

    TBA?: N

  Instructors
  - First: Maria
    Middle: Pino
    Last: Martin

- Format: P
  Number: 01
  Status: X
  Max. Enrollment: 50
  SCORE Number: 20084
  Meetings
  - Beg. Time: 19:30:00
    End Time: 20:50:00
    Place: EQUAD D221
    Days
    - Day: T

    TBA?: N

  Instructors
  - First: Bo
    Middle:
    Last: Xu
  - First: Zhili
    Middle:
    Last: Zhang

- Course Codes
  - Code: MAE
    Number: 501
    Subletter:
    Home Dept?: Y

Title	Mathematical Methods of Engineering Analysis I
Topic	
Subletter	
Description	Methods of mathematical analysis for the solution of problems in physics and engineering. Topics include an introduction to functional analysis, linear analysis & eigenvalue problems for matrices & operators, Sturm-Liouville theory, Green's functions for the solution of linear ordinary differential equations and Poisson's equation, and the calculus of variations, and the inverse and implicit function theorems.
Max. Enrollment	50
May PDF?	N
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

- Author Name: L. Debnath & PR Mikusinski
  Title: Introduction to Hilbert Spaces with Applications
- Author Name: RA Horn & CR Johnson
  Title: Matrix Analysis
- Author Name: M. Greenberg
  Title: Foundations of Applied Mathematics
- Author Name: IS Sokolniroff & RM Redheffer
  Title: Mathematics of Physics & Modern Engineering

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 50
  SCORE Number: 20311

  Meetings
  - Beg. Time: 09:00:00
    End Time: 10:20:00
    Place: EQUAA A224

    Days
    - Day: T
    - Day: Th

    TBA?: N

  Instructors
  - First: Naomi
    Middle: Ehrich
    Last: Leonard

- Course Codes
  - Code: MSE
    Number: 501
    Subletter:
    Home Dept?: Y
  - Code: MAE
    Number: 561
    Subletter:
    Home Dept?: N

Title	Introduction to Materials
Topic	
Subletter	
Description	Emphasizes the connection between microstructural features of materials and their properties, and how processing conditions control structure. Topics include atomic bonding, crystal structure, thermodynamics, phase diagrams, defects, microstructure, diffusion, phase transformations, nucleation, coarsening, glasses, elastic and plastic deformation, fracture, processing, composites, and electronic properties.
Max. Enrollment	50
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

- Author Name: J.F. Nye
  Title: Physical Properties of Crystals
- Author Name: P. Haasen
  Title: Physical Metallurgy
- Author Name: C. Hall
  Title: Polymers Materials
- Author Name: Y.T. Ciang, D. Birnie, and W.D. Kingery
  Title: Physical Ceramics
- Author Name: D.A. Porter and K.E. Easterling
  Title: Phase Transformations in Metals and Alloys
- Author Name: C. Kittel
  Title: Introduction to Solid State Physics

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 50
  SCORE Number: 21439

  Meetings

  - Beg. Time: 14:30:00
    End Time: 15:50:00
    Place: BOWEN 222

    Days

    - Day: M
    - Day: W

    TBA?: N

  Instructors

  - First: George
    Middle: W.
    Last: Scherer

- Course Codes
  - Code: MAE
    Number: 339
    Subletter:
    Home Dept?: Y

Title: Independent Work
Topic:
Subletter:
Description: Student selects subject and advisor - defines problem to be studied and proposes work plan. A list of possible subjects of particular interest to faculty and staff members is provided. Written report and oral presentation at end of semester to faculty, staff, fellow students and guests. Independent work is intended for juniors or seniors doing only a one term project. 339 Fall Term project; 340 Spring Term project.
Max. Enrollment: 40
May PDF?: N
May Audit?: N
Assignments:
Website:
Final Exam Type: Other
Grading
- Perc.: 75
  Type: Paper In Lieu of Final
- Perc.: 20
  Type: Oral Presentation(s)
- Perc.: 5
  Type: Precept Participation

Sample Reading List
Sections
- Format: C
  Number: 01
  Status: O
  Max. Enrollment: 20
  SCORE Number: 20072
  Meetings
  - Beg. Time: 12:30:00
    End Time: 13:20:00
    Place: FRIEN 110
    Days
    - Day: W
      TBA?: N
  Instructors
  - First: N.
    Middle: Jeremy
    Last: Kasdin
- Format: C
  Number: 02
  Status: O
  Max. Enrollment: 20
  SCORE Number: 20073
  Meetings
  - Beg. Time: 19:30:00
    End Time: 20:20:00
    Place: FRIEN 110
    Days
    - Day: W
      TBA?: N
  Instructors
  - First: N.
    Middle: Jeremy
    Last: Kasdin

- Course Codes
  - Code: MAE
    Number: 339
    Subletter: D
    Home Dept?: Y
- Title: Independent Work with Design
- Topic:
- Subletter: D
- Description: Course similar to MAE 339-340. Principal difference is that the project must incorporate aspects and principals of design for a system, product, vehicle, device, apparatus, or other design element. Written report and oral presentation at end of semester to faculty, staff, fellow students and guests. Independent work with design is intended for juniors or seniors doing only a one term project. 339D Fall Term project; 340D Spring Term project.
- Max. Enrollment: 40
- May PDF?: N
- May Audit?: N
- Assignments:
- Website:
- Final Exam Type: Other
- Grading
  - Perc.: 75
    Type: Paper In Lieu of Final
  - Perc.: 20
    Type: Oral Presentation(s)
  - Perc.: 5
    Type: Precept Participation
- Sample Reading List
- Sections
  - Format: C
    Number: 01
    Status: O
    Max. Enrollment: 20
    SCORE Number: 20074
    Meetings
    - Beg. Time: 12:30:00
      End Time: 13:20:00
      Place: FRIEN 110
      Days
      - Day: W
        TBA?: N
    Instructors
    - First: N.
      Middle: Jeremy
      Last: Kasdin
  - Format: C
    Number: 02
    Status: O
    Max. Enrollment: 20
    SCORE Number: 20075
    Meetings
    - Beg. Time: 19:30:00
      End Time: 20:20:00
      Place: FRIEN 110
      Days
      - Day: W
        TBA?: N
    Instructors
    - First: N.
      Middle: Jeremy
      Last: Kasdin
- Course Codes
  - Code: MAE
    Number: 427
    Subletter:
    Home Dept?: Y
- Title: Fossil Fuel Energy Conversion: Mobile Power Plants
- Topic:
- Subletter:

Description	This course will develop an overview of technology and emission control of modern internal combustion power plants. Fundamental concepts of phenomena associated with mobile power plant design and applications, including both air-breathing and non-airbreathing propulsion will be discussed. Material on spark ignition and diesel power plants, as well as air-breathing propulsion devices, primarily gas turbines, and chemical rockets, will be covered. In addition, combustion emission and emission control will be discussed. Throughout the course, (See other information)
Max. Enrollment	40
May PDF?	N
May Audit?	N
Assignments	Homework problems, readings, and a sharply focused paper, (10 pages). Check within two weeks of Course Initiation for Recommended Textbook Purchases. Library reserve of all references will be available.
Website	
Final Exam Type	Final

Grading

- Perc. 30
  Type MidTerm Exam
- Perc. 35
  Type Final Exam
- Perc. 5
  Type Precept Participation
- Perc. 30
  Type Problem Set(s)

Sample Reading List

- Author Name Ferguson and Kirkpatrick
  Title Internal Combustion Engines:Applied Thermal Sciences, 2nd Ed
- Author Name Hill and Peterson
  Title Mechanics and Thermodynamics of Propulsion
- Author Name Wark, Warner, and Davis
  Title Air Pollution, Its Origin and Control
- Author Name Sutton
  Title Rocket Propulsion Elements
- Author Name Lecture notes are generally distributed throughout
  Title the course

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 40
  SCORE Number: 20076
  Meetings
  - Beg. Time: 11:00:00
    End Time: 11:50:00
    Place: EQUAD D221
    Days
    - Day: M
    - Day: W
    - Day: F

    TBA?: N

  Instructors
  - First: Frederick
    Middle: Lewis
    Last: Dryer

- Format: C
  Number: 01
  Status: O
  Max. Enrollment: 40
  SCORE Number: 20077
  Meetings
  - Beg. Time: 10:00:00
    End Time: 10:50:00
    Place: EQUAD D221
    Days
    - Day: Th

    TBA?: N

  Instructors
  - First: Frederick
    Middle: Lewis
    Last: Dryer

  - First: Timothy
    Middle: Michael
    Last: Ombrello

- Course Codes
  - Code: ELE
    Number: 521
    Subletter:
    Home Dept?: Y
  - Code: MAE
    Number: 547
    Subletter:
    Home Dept?: N

Title	Linear System Theory
Topic	
Subletter	
Description	This course covers the fundamentals of linear system theory. Various topics important for further study in dynamic systems, control and communication and signal processing are presented.
Max. Enrollment	36
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Final

Grading

Sample Reading List

- Author Name: Brockett
  Title: Finite Dimensional Linear Systems
- Author Name: Delchamps
  Title: State Space and Input Output Linear Systems
- Author Name: Kailath
  Title: Linear Systems
- Author Name: Wonham
  Title: Linear Multivariable Control: A Geometric Approach
- Author Name: Rugh
  Title: Linear Systems Theory

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 36
  SCORE Number: 20487

  Meetings
  - Beg. Time: 15:00:00
    End Time: 16:20:00
    Place: FRIEN 108

    Days
    - Day: M
    - Day: W

    TBA?: N

  Instructors
  - First: Peter
    Middle: Jeffrey
    Last: Ramadge
  - First: Jiaping
    Middle:
    Last: Liu

- Course Codes
  - Code: MAE
    Number: 435
    Subletter:
    Home Dept?: Y

Title	Special Topics in Mechanical and Aerospace Engineering
Topic	Entrepreneurial Engineering
Subletter	
Description	This course builds on the technical foundations established in the engineering program, and extends the scope to include the business, financial, and marketing components that lead to successful entrepreneurial ventures. Students will be directly engaged in the process of identifying, creating and exploiting entrepreneurial opportunities. Entrepreneurial design will be introduced and developed. Students, working in small multidisciplinary teams, will identify, design and prototype a highly marketable, consumer product. Classic and modern market analysis, manufacture and distribution will be introduced along with business planning & finance.
Max. Enrollment	30
May PDF?	Y
May Audit?	Y
Assignments	Reading/Writing Assignments: Reading will be from distributed materials and printed and web-based references. Midterm and final reports (business plans and design reports). Presentations.
Website	
Final Exam Type	Other

Grading

- Perc.: 50
  Type: Design Project(s)
- Perc.: 25
  Type: Oral Presentation(s)
- Perc.: 25
  Type: Precept Participation

Sample Reading List

- Author Name: H.H. Stevenson, M.J. Roberts & H. Grousbeck (5th Ed.)
  Title: New Business Ventures & the Entrepreneur, 1999 McGraw Hill
- Author Name: The Indus Entrepreneurs (TiE) (Wiley 2003) - Essentials
  Title: of Entrepreneurship: What it Takes to Create Successful...
- Author Name: T.R. Hawthorne, NTC Business Books, 1997
  Title: The Complete Guide to Infomercial Marketing
- Author Name: L.C. Farrell (Wiley 2003) - Getting Entrepreneurial:
  Title: Creating & Growing Your Own Business in the 21st Century

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 30
  SCORE Number: 20078

  Meetings

  - Beg. Time: 15:00:00
    End Time: 16:20:00
    Place: EQUAD D221

    Days

    - Day: M
    - Day: W

    TBA?: N

  Instructors

  - First: Daniel
    Middle: Mark
    Last: Nosenchuck

- Course Codes
  - Code: MAE
    Number: 437
    Subletter:
    Home Dept?: Y
  - Code: EGR
    Number: 437
    Subletter:
    Home Dept?: N

Title	Introduction to Innovation Process Management
Topic	
Subletter	
Description	In today's hypercompetitive global marketplace, innovation is the lifeblood of any business enterprise. This course exposes students to all fundamental aspects of the technological innovation process: invention/concept development, intellectual property, business plan preparation, competitive intelligence, R&D management, and critical success factors, project management, commercialization. It covers the basic management practices required to excel in the craft of successful innovation and prepares students to become technology-savvy leaders of industry or government, as well as managers and executives in a complex technological society.
Max. Enrollment	30
May PDF?	Y
May Audit?	Y
Assignments	Specific reading assignments will be given out at the beginning of each lecture. Attendance counts for 20% of the final grade.
Website	
Final Exam Type	Take-Home

Grading

- Perc.: 40
  Type: Take Home Final Exam
- Perc.: 20
  Type: Oral Presentation(s)
- Perc.: 20
  Type: Precept Participation
- Perc.: 20
  Type: Other (See Instructor)

Sample Reading List

- Author Name: W.L. Miller and L. Morris
  Title: Fourth Generation R&D
- Author Name: M.L. Patterson
  Title: Accelerating Innovation
- Author Name: E.I. Schwartz
  Title: Juice: The Creative Fuel that Drives World-Class Inventors
- Author Name: P. Drucker
  Title: Management Challenges for the 21st Century
- Author Name: J.A. Heim and W.D. Compton
  Title: Manufacturing Systems: Foundations of World-Class Practice
- Author Name: R.G. Cooper, Winning at New Products:
  Title: Accelerating the Process from Idea to Launch, 3rd Ed.

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 30
  SCORE Number: 22100

  Meetings

  - Beg. Time: 11:00:00
    End Time: 12:20:00
    Place: FRIEN 108

    Days

    - Day: T
    - Day: Th

    TBA?: N

  Instructors

  - First: Karl
    Middle: H.
    Last: Zaininger

- Course Codes
  - Code: MAE
    Number: 541
    Subletter:
    Home Dept?: Y
  - Code: APC
    Number: 571
    Subletter:
    Home Dept?: N

Title	Applied Dynamical Systems
Topic	
Subletter	
Description	Phase-plane methods and single-degree-of-freedom nonlinear oscillators; invariant manifolds, local and global analysis, structural stability and bifurcation, center manifolds, and normal forms; averaging and perturbation methods, forced oscillations, homoclinic orbits, and chaos; and Melnikov's method, the Smale horseshoe, symbolic dynamics, and strange attractors.
Max. Enrollment	30
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

- Author Name: J. Guckenheimer & P. Holmes
  Title: Nonlinear Oscillations, Dynamical Systems & Bifurcations of
- Author Name: A.A. Andronov, E.A. Vitt, S.E. Khaiken
  Title: Theory of Oscillators
- Author Name: M.W. Hirsch, S. SImale adn R.L. Devaney
  Title: Dirrential Equations, Dynamical Systems & An Intro to Chaos

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 30
  SCORE Number: 20316

  Meetings

  - Beg. Time: 13:30:00
    End Time: 14:50:00
    Place: FINEH 110

    Days

    - Day: T
    - Day: Th

    TBA?: N

  Instructors

  - First: Clarence
    Middle: Worth
    Last: Rowley

- Course Codes
  - Code: MAE
  - Number: 542
  - Subletter:
  - Home Dept?: Y
- Title: Advanced Dynamics
- Topic:
- Subletter:
- Description: Principles and methods for formulating and analyzing mathematical models of physical systems; Newtonian, Lagrangian, and Hamiltonian formulations of particle and rigid and elastic body dynamics; canonical transformations, Hamilton-Jacobi theory; and integrable and nonintegrable systems. Additional topics are explored at the discretion of the instructor.
- Max. Enrollment: 30
- May PDF?: N
- May Audit?: Y
- Assignments:
- Website:
- Final Exam Type: Other
- Grading
- Sample Reading List
  - Author Name: H. Goldstein
    Title: Classical Mechanics
  - Author Name: V.I. Arnold
    Title: Mathematical Methods of Classical Mechanics
  - Author Name: C. Lanczos
    Title: The Variational Principles of Mechanics
- Sections
  - Format: S
    Number: 01
    Status: O
    Max. Enrollment: 30
    SCORE Number: 20317
    Meetings
    - Beg. Time: 11:00:00
      End Time: 12:20:00
      Place: EQUAA A224
      Days
      - Day: T
      - Day: Th
      TBA?: N
    Instructors
    - First: N.
      Middle: Jeremy
      Last: Kasdin

- Course Codes
  - Code: AST
    Number: 551
    Subletter:
    Home Dept?: Y
  - Code: MAE
    Number: 525
    Subletter:
    Home Dept?: N

Title	General Plasma Physics I
Topic	
Subletter	
Description	An introductory course to plasma physics, with sample applications in fusion, space and astrophysics, semiconductor etching, microwave generation, plasma propulsion, high power laser propagation in plasma; characterization of the plasma state, Debye shielding, plasma and cyclotron frequencies, collision rates and mean-free paths, atomic processes, adiabatic invariance, orbit theory, magnetic confinement of single-charged particles, two-fluid description, magnetohydrodynamic waves and instabilities, heat flow, diffusion, kinetic description, and Landau damping. The course may be taken by undergraduates with permission of the instructor.
Max. Enrollment	30
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other
Grading	

Sample Reading List

- Author Name: Goldston and Rutherford
  Title: Introduction to Plasma Physics
- Author Name: Stix and von Goeler
  Title: GPPI lecture notes
- Author Name: Hazeltine and Waelbroeck
  Title: The Framework of Plasma Physics

Sections

- Format: C
  Number: 01
  Status: O
  Max. Enrollment: 30
  SCORE Number: 21697

  Meetings

  - Beg. Time: 10:00:00
    End Time: 10:50:00
    Place: JADWH A07

    Days

    - Day: M
    - Day: W
    - Day: F

    TBA?: N

  Instructors

  - First: Nathaniel
    Middle: J.
    Last: Fisch
  - First: Hong
    Middle:
    Last: Qin

- Course Codes
  - Code: GEO
    Number: 425
    Subletter:
    Home Dept?: Y
  - Code: MAE
    Number: 425
    Subletter:
    Home Dept?: N

Title	Introduction to Physical Oceanography
Topic	
Subletter	
Description	The study of the oceans as a major influence on the atmosphere and the world environment. The contrasts between the properties of the upper and deep oceans; the effects of stratification; the effect of rotation; the wind-driven gyres; the thermohaline circulation.
Max. Enrollment	30
May PDF?	N
May Audit?	N
Assignments	Three to four problems every two weeks.
Website	
Final Exam Type	Final

Grading

- Perc.: 20
  Type: MidTerm Exam
- Perc.: 40
  Type: Final Exam
- Perc.: 40
  Type: Problem Set(s)

Sample Reading List

- Author Name: Pond & Pickard
  Title: Introductory Dynamical Oceanography, 2nd ed.
- Author Name: Pickard & Emery
  Title: Descriptive Physical Oceanography: An Introduction
- Author Name: Open University Course Team
  Title: Ocean Circulation (2001)
- Author Name: Open University Course Team
  Title: Waves, tides, and Shallow-Water Processes

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 30
  SCORE Number: 20027

  Meetings

  - Beg. Time: 10:00:00
    End Time: 10:50:00
    Place: GUYOT 154

    Days

    - Day: M
    - Day: W
    - Day: F

    TBA?: N

  Instructors

  - First: Anand
    Middle:
    Last: Gnanadesikan

- Course Codes
  - Code: MAE
    Number: 521
    Subletter:
    Home Dept?: Y

Title	Optics and Lasers
Topic	
Subletter	
Description	An introduction to principles of lasers. Topics include propagation theory, interaction of light and matter, Fourier optics, and a description of operational characteristics of lasers, light scattering, and nonlinear optics.
Max. Enrollment	20
May PDF?	N
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

- Author Name: Eckbreth, Alan C
  Title: Laser Diagnostics for Combustion Temperature & Species

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 20
  SCORE Number: 20312

  Meetings

  - Beg. Time: 13:30:00
    End Time: 14:20:00
    Place: EQUAJ J201

    Days

    - Day: M
    - Day: W
    - Day: F

    TBA?: N

  Instructors

  - First: Richard
    Middle: Bryant
    Last: Miles

- Course Codes
  - Code: MAE
  - Number: 551
  - Subletter:
  - Home Dept?: Y
- Title: Fluid Mechanics
- Topic:
- Subletter:
- Description: An introduction to fluid mechanics. The course explores the development of basic conservation laws in integral and differential form; one-dimensional compressible flows, shocks and expansion waves; effects of energy addition and friction; unsteady and two-dimensional flows and method of characteristics. Reviews classical incompressible flow concepts, including vorticity, circulation, and potential flows. Introduces viscous and diffusive phenomena.
- Max. Enrollment: 20
- May PDF?: N
- May Audit?: Y
- Assignments:
- Website:
- Final Exam Type: Other
- Grading
- Sample Reading List
- Sections
  - Format: L
  - Number: 01
  - Status: O
  - Max. Enrollment: 20
  - SCORE Number: 20318
  - Meetings
    - Beg. Time: 10:00:00
      - End Time: 11:20:00
      - Place: EQUAJ J201
      - Days
        - Day: M
        - Day: W
        - Day: F
      - TBA?: N
    - Instructors
      - First: Garry
      - Middle: Leslie
      - Last: Brown

- Course Codes
  - Code: CEE
  - Number: 361
  - Subletter:
  - Home Dept?: Y
  - Code: MAE
  - Number: 325
  - Subletter:
  - Home Dept?: N
- Title: Structural Analysis and Introduction to Finite Element Methods
- Topic:
- Subletter:
- Description: Basic concepts of matrix structural analysis. Direct stiffness method. Axial force member. Beam bending member. Formation of element stiffness matrix. Assembling of global stiffness matrix. Introduction of boundary conditions. Solution of linear algebraic equations. Special analysis procedures. The finite element method. Introduction and basic formulation. Plane stress and plane strain problems. Plate bending problems. The use and implementation of structural analysis and finite element computer codes using Mathlab is emphasized throughout the course.
- Max. Enrollment: 20
- May PDF?: Y
- May Audit?: N
- Assignments: Eight homework sets, two midterm exams, one final project.
- Website:
- Final Exam Type: Other

Grading	
• Perc.	30
Type	MidTerm Exam
• Perc.	30
Type	Design Project(s)
• Perc.	40
Type	Problem Set(s)

Sample Reading List	
• Author Name	McGuire & Gallagher, John Wiley
Title	Matrix Structural Analysis
• Author Name	Kwon and Bang, CRC
Title	The Finite Element Method Using MatLab
• Author Name	Zienkiewicz, Taylor and Zhu; Elsevier
Title	The Finite Element Method: Its Basis and Fundamentals

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 20
  SCORE Number: 20236
  Meetings
  - Beg. Time: 11:00:00
    End Time: 12:20:00
    Place: FRIEN 109
    Days
    - Day: T
    - Day: Th

    TBA?: N

  Instructors
  - First: Jean-Herve
    Middle:
    Last: Prevost

- Format: P
  Number: 01
  Status: O
  Max. Enrollment: 30
  SCORE Number: 22365
  Meetings
  - Beg. Time: 19:30:00
    End Time: 22:20:00
    Place: FRIEN 007
    Days
    - Day: Th

    TBA?: N

  Instructors
  - First: Nima
    Middle:
    Last: Rahbar
  - First: Jean-Herve
    Middle:
    Last: Prevost
  - First: Scott
    Middle: Edward
    Last: Sanborn

- Format: P
  Number: 02
  Status: X
  Max. Enrollment: 25
  SCORE Number: 22366
  Meetings
  - Beg. Time: 19:30:00
    End Time: 22:20:00
    Place: MCCOH B59
    Days
    - Day: M

    TBA?: N

  Instructors
  - First: Nima
    Middle:
    Last: Rahbar

- Course Codes
  - Code: WWS
    Number: 585
    Subletter: B
    Home Dept?: Y
  - Code: MAE
    Number: 580
    Subletter:
    Home Dept?: N

Title	Topics in Science, Technology, and Environmental Policy
Topic	Living in a Greenhouse: Technology & Policy
Subletter	
Description	These are courses intended to help students develop and apply skills in the application of scientific, technological, and environmental analyses to problems of policy interest. Fall courses are numbered 585, Spring courses are numbered 586.
Max. Enrollment	20
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

Sections

- Format: S
  Number: 01
  Status: O
  Max. Enrollment: 20
  SCORE Number: 23080

  Meetings
  - Beg. Time: 19:00:00
    End Time: 22:00:00
    Place: ROBEH 015

    Days
    - Day: M

    TBA?: N

  Instructors
  - First: Robert
    Middle: Harry
    Last: Socolow

- Course Codes
  - Code: MAE
    Number: 527
    Subletter:
    Home Dept?: Y

Title	Physics of Gases
Topic	
Subletter	
Description	Physical and chemical topics of basic importance in modern fluid mechanics, plasma dynamics, and combustion science: statistical calculations of thermodynamic properties of gases; chemical and physical equilibria; adiabatic temperatures of complex reacting systems; quantum mechanical analysis of atomic and molecular structure and atomic-scale collision phenomena; transport properties; reaction kinetics, including chemical, vibrational, and ionization phenomena; and propagation, emission, and absorption of radiation.
Max. Enrollment	15
May PDF?	N
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20313

  Meetings

  - Beg. Time: 09:00:00
    End Time: 09:50:00
    Place: EQUAJ J201

    Days

    - Day: M
    - Day: W
    - Day: F

    TBA?: N

  Instructors

  - First: Szymon
    Middle:
    Last: Suckewer

- Course Codes
  - Code: MAE
    Number: 531
    Subletter:
    Home Dept?: Y

Title	Combustion
Topic	
Subletter	
Description	Chemical thermodynamics, theory of chemical kinetics, oxidation of hydrogen and hydrocarbons, transport phenomena, conservation equations of chemically reacthing flows, Rankin-Hugoniot relations, laminar premixed and diffusion flames, turblent flames, detonation waves, droplet and spray combustion, ignition and extinction, flame stabilization and blowoff, pollutant chemistry.
Max. Enrollment	15
May PDF?	N
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

- Author Name: SR Turns
  Title: An Introduction to Combustion; Concepts and Applications

- Author Name: I Glassman
  Title: Combustion

- Author Name: K. Kikao
  Title: Principles of Combustion

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20314

  Meetings

  - Beg. Time: 15:00:00
    End Time: 16:20:00
    Place: FRIEN 202

    Days

    - Day: M

    - Day: W

    TBA?: N

  Instructors

  - First: Chung
    Middle: King
    Last: Law

- Course Codes
  - Code: MAE
    Number: 555
    Subletter:
    Home Dept?: Y

Title	Non-Equilibrium Gas Dynamics
Topic	
Subletter	
Description	Noncontinuum descritpion of transport and reactive flow. The course examins mlecular collisions Bolzmunn equation, and Chapmann-Easkog expansion for near-equilibrium flows; flows with transnational, vibrational and chemical non-equiliburum; shock structure; and plasma with chemical reactions
Max. Enrollment	15
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

- Author Name: GA Bird
  Title: Molecular Gas dynamics and direct simulation

- Author Name: WG Vincenti & CH Kruger Jr
  Title: Introduction to Physical Gas Dynamics

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20315

  Meetings

  - Beg. Time: 11:00:00
    End Time: 12:20:00
    Place: FRIEN 306

    Days

    - Day: M
    - Day: Th

    TBA?: N

  Instructors

  - First: Yiguang
    Middle:
    Last: Ju

- Course Codes
  - Code: MAE
    Number: 553
    Subletter:
    Home Dept?: Y

Title	Turbulent Flow
Topic	
Subletter	
Description	Physical and statistical descriptions of turbulence, and a critical review of phenomenological theories for turbulent flows. The course examines scales of motion; correlations and spectra; homogeneous turbulent flows; inhomogeneous shear flows; turbulent flows in pipes and channels; turbulent boundary layers; calculation methods for turbulent flows (Reynolds stress equations, LES, DNS); and current directions in turbulence research. This course is offered in alternate years.
Max. Enrollment	15
May PDF?	N
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading

Sample Reading List

Sections

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 15
  SCORE Number: 20319

  Meetings

  - Beg. Time: 11:00:00
    End Time: 12:20:00
    Place: EQUAJ J201

    Days

    - Day: T
    - Day: Th

    TBA?: N

  Instructors

  - First: Alexander
    Middle: John
    Last: Smits

- Course Codes
  - Code: MAE
    Number: 564
    Subletter:
    Home Dept?: Y
  - Code: MSE
    Number: 512
    Subletter:
    Home Dept?: N

Title	Structural Materials
Topic	
Subletter	
Description	Stress/strain behavior of materials; dislocation theory and strengthening mechanisms; yield strength; materials selection. Fundamentals of plasticity, Tresca and Von Mieses yield criteria. Case study on forging: upper and lower bounds. Basic elements of fracture. Fracture mechanics. Mechanisms of fracture. The fracture toughness. Case studies and design. Fatigue mechanisms and life prediction methodologies.
Max. Enrollment	15
May PDF?	N
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other
Grading	
Sample Reading List	
Sections	

- Format: L
  Number: 01
  Status: O
  Max. Enrollment: 15
  SCORE Number: 23592
  Meetings
  - Beg. Time: 15:00:00
    End Time: 16:20:00
    Place: COMPU 102
    Days
    - Day: T
    - Day: Th

    TBA?: N
  Instructors
  - First: Winston
    Middle: Oluwole
    Last: Soboyejo