Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	120
						May PDF?	N
	MAE	305		Y		May Audit?	N
	MAT	301		N		Assignments	
Title	Mathematics in Engineering I					Website	
Topic						Final Exam Type	Final
Subletter						Grading	Perc. Type
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.						

Sample Reading List	Author Name	Title
	Boyce & DiPrima	Elementary Differential Equations & Boundary Value Problems

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings				Days Day	TBA?	Instructors		
						Beg. Time	End Time	Place				First	Middle	Last
	L	01	O	120	20079	11:00:00	11:50:00	BOWEN 222	M W F	N	Morton	Daniel	Kostin
											Zheng		Chen
											Raghavendra	Pradeep	Kukillaya
											Zhanhua		Ma

Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	60
						May PDF?	N
	MAE	221		Y		May Audit?	N
Title	Thermodynamics					Assignments	Weekly reading assignments and problem sets, about 9 hours per week.
Topic							
Subletter						Website	
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.					Final Exam Type	Final
						Grading	Perc. Type
							20 MidTerm Exam
							40 Final Exam
							40 Problem Set(s)

Sample Reading List	Author Name	Title
	Moran & Shapiro	Fundamentals of Engineering Thermodynamics, 5th Ed.

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings				Days Day	TBA?	Instructors		
						Beg. Time	End Time	Place				First	Middle	Last
	B	01	O	12	20059	13:30:00	16:20:00	EQUAJ J209	M	N	Michael		Vocaturo
											Syed	Sohail Hamid	Zaidi
											Grunde		Jomaas
	B	02	X	12	20060	13:30:00	16:20:00	EQUAJ J209	T	N	Michael		Vocaturo
											Syed	Sohail Hamid	Zaidi
											Grunde		Jomaas
	B	03	O	12	20061	13:30:00	16:20:00	EQUAJ J209	W	N	Michael		Vocaturo
											Syed	Sohail Hamid	Zaidi
											Emanuel	Solomon	Stockman
	B	04	O	12	20062	13:30:00	16:20:00	EQUAJ J209	Th	N	Michael		Vocaturo
											Syed	Sohail Hamid	Zaidi
											Chun-Wei		Pao
	L	01	O	60	20063	10:00:00	10:50:00	FRIEN 004	M W F	N	Daniel	Mark	Nosenchuck
	C	01	O	50	20064	12:30:00	13:20:00	EQUAD D221	M	N	Daniel	Mark	Nosenchuck
											Syed	Sohail Hamid	Zaidi

Course 1

Course Codes	Code	Number	Subletter	Home Dept?			Max. Enrollment	60	
							May PDF?	Y	
							May Audit?	Y	
	MAE	223		Y			Assignments	Weekly homework assignments, accounts for 30% of the final grade. Weekly quizzes, accounts for 5% of the final grade.	
	CEE	323		N					
Title	Modern Solid Mechanics								
Topic									
Subletter							Website		
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.						Final Exam Type	Final	
							Grading	Perc.	Type
								25	MidTerm Exam
								40	Final Exam
								5	Quizzes
								30	Problem Set(s)

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings				Days	TBA?	Instructors		
						Beg. Time	End Time	Place		Day		First	Middle	Last
	L	01	O	60	20080	11:00:00	12:20:00	EQUAD D221	T Th	N	Mikko Yong	Petteri	Haataja Yang

Course 2

Course Codes	Code	Number	Subletter	Home Dept?			Max. Enrollment	60	
							May PDF?	N	
	MAE	331		Y			May Audit?	N	
Title	Aircraft Flight Dynamics						Assignments	Mix of problem sets and short projects.	
Topic							Website		
Subletter							Final Exam Type	Final	
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.						Grading	Perc.	Type
								20	MidTerm Exam
								35	Final Exam
								10	Precept Participation
								35	Problem Set(s)

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings				Days	TBA?	Instructors		
						Beg. Time	End Time	Place		Day		First	Middle	Last
	L	01	O	60	20081	15:00:00	16:20:00	EQUAD D221	T Th	N	Ellen	Meredith	Taylor
											Robert	Frank	Stengel
											Milos		Ilak
											Sunil	Doulatram	Ahuja
	P	01	X	60	22359								

Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	59	
						May PDF?	N	
	MAE	321		Y		May Audit?	N	
Title	Engineering Design					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.	
Topic								
Subletter						Website		
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.					Final Exam Type	Take-Home	
						Grading	Perc.	Type
							25	MidTerm Exam
							25	Design Project(s)
							25	Take Home Final Exam
							10	Lab Reports
							15	Problem Set(s)

Sample Reading List	Author Name		Title	
	Shigley and Mische		Mechanical Engineering Design	
	M.F. Ashby		Materials Selection in Mechanical Design	

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings				Days / Day	TBA?	Instructors		
						Beg. Time	End Time	Place				First	Middle	Last
	B	01	X	15	20065	13:30:00	16:20:00	EQUAC C119	M	N	Glenn	Arther	Northey
											Guoguang		Fu
	B	02	O	15	20066	13:30:00	16:20:00	EQUAC C119	T	N	Glenn	Arther	Northey
											Jianbo		Chen
	B	03	O	15	20067	13:30:00	16:20:00	EQUAC C119	W	N	Glenn	Arther	Northey
											Jun		Song
	B	04	O	15	20068	13:30:00	16:20:00	EQUAC C119	Th	N	Glenn	Arther	Northey
	B	05	O	15	20069	13:30:00	16:20:00	EQUAC C119	F	N	Glenn	Arther	Northey
	L	01	O	59	20070	11:00:00	12:20:00	FRIEN 004	T Th	N	Winston	Oluwole	Soboyejo

Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	55	
						May PDF?	Y	
	MAE	324		Y		May Audit?	Y	
Title	Structure and Properties of Materials					Assignments	Weekly problem sets, question cards, and reading in reference texts.	
Topic								
Subletter						Website		
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.					Final Exam Type	Final	
						Grading	Perc.	Type
							20	MidTerm Exam
							40	Final Exam
							20	Other Exam
							5	Precept Participation
							15	Problem Set(s)

Sample Reading List	Author Name		Title	
	Callister		Materials Science & Engineering	

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings				Days / Day	TBA?	Instructors		
						Beg. Time	End Time	Place				First	Middle	Last
	L	01	O	55	20082	13:30:00	14:50:00	EQUAD D221	T Th	N	Emily	Ann	Carter
	P	01	X	55	20083	12:30:00	13:20:00	EQUAD D221	Th	N	Srevatsan		Muralidharan

Course Codes	Code	Number	Subletter	Home Dept?					Max. Enrollment	50			
									May PDF?	Y			
	MAE	335		Y					May Audit?	Y			
Title	Fluid Dynamics								Assignments	Reading 30-40 pages of text. Weekly problem sets.			
Topic									Website				
Subletter									Final Exam Type	Final			
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.								Grading	Perc.	Type		
										30	MidTerm Exam		
										40	Final Exam		
										30	Problem Set(s)		

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings						Instructors		
						Beg. Time	End Time	Place	Days Day	TBA?		First	Middle	Last
	L	01	O	50	20071	10:00:00	10:50:00	EQUAD D221	M W F	N		Maria	Pino	Martin
	P	01	X	50	20084	19:30:00	20:50:00	EQUAD D221	T	N		Bo Zhili		Xu Zhang

Course Codes	Code	Number	Subletter	Home Dept?					Max. Enrollment	50			
									May PDF?	N			
	MAE	501		Y					May Audit?	Y			
Title	Mathematical Methods of Engineering Analysis I								Assignments				
Topic									Website				
Subletter									Final Exam Type	Other			
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.								Grading	Perc.	Type		

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings						Instructors		
						Beg. Time	End Time	Place	Days Day	TBA?		First	Middle	Last
	L	01	O	50	20311	09:00:00	10:20:00	EQUAA A224	T Th	N		Naomi	Ehrich	Leonard

Course Codes

Code	Number	Subletter	Home Dept?
MSE	501		Y
MAE	561		N

Max. Enrollment	50
May PDF?	Y
May Audit?	Y
Assignments	

Title: Introduction to Materials

Topic:

Subletter:

Website:

Final Exam Type: Other

Grading | Perc. | Type

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.

Sample Reading List

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

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Beg. Time	End Time	Place	Days/Day	TBA?	First	Middle	Last
L	01	O	50	21439	14:30:00	15:50:00	BOWEN 222	M W	N	George	W.	Scherer

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Course Codes

Code	Number	Subletter	Home Dept?
MAE	339		Y

Max. Enrollment	40
May PDF?	N
May Audit?	N

Title: Independent Work

Topic:

Subletter:

Assignments:

Website:

Final Exam Type: Other

Grading

Perc.	Type
75	Paper In Lieu of Final
20	Oral Presentation(s)
5	Precept Participation

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.

Sample Reading List

Author Name	Title

Sections

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

-

Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	40
						May PDF?	N
	MAE	339	D	Y		May Audit?	N
Title	Independent Work with Design					Assignments	
Topic						Website	
Subletter	D					Final Exam Type	Other
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.					Grading	

	Perc.	Type
	75	Paper In Lieu of Final
	20	Oral Presentation(s)
	5	Precept Participation

Sample Reading List	Author Name		Title	

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings					TBA?	Instructors		
						Beg. Time	End Time	Place	Days / Day			First	Middle	Last
	C	01	O	20	20074	12:30:00	13:20:00	FRIEN 110	W	N		N.	Jeremy	Kasdin
	C	02	O	20	20075	19:30:00	20:20:00	FRIEN 110	W	N		N.	Jeremy	Kasdin

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Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	40
						May PDF?	N
	MAE	427		Y		May Audit?	N
Title	Fossil Fuel Energy Conversion: Mobile Power Plants					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.
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)					Website	
						Final Exam Type	Final
						Grading	

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

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings					TBA?	Instructors		
						Beg. Time	End Time	Place	Days / Day			First	Middle	Last
	L	01	O	40	20076	11:00:00	11:50:00	EQUAD D221	M W F	N		Frederick	Lewis	Dryer
	C	01	O	40	20077	10:00:00	10:50:00	EQUAD D221	Th	N		Frederick	Lewis	Dryer
												Timothy	Michael	Ombrello

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Course Codes	Code	Number	Subletter	Home Dept?				Max. Enrollment	36		
								May PDF?	Y		
	ELE	521		Y				May Audit?	Y		
	MAE	547		N				Assignments			
Title	Linear System Theory							Website			
Topic								Final Exam Type	Final		
Subletter								Grading	Perc.	Type	
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.										

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days Day	TBA?	Instructors First	Middle	Last
	L	01	O	36	20487	15:00:00	16:20:00	FRIEN 108	M W	N	Peter Jiaping	Jeffrey	Ramadge Liu

-

Course Codes	Code	Number	Subletter	Home Dept?			Max. Enrollment	30		
							May PDF?	Y		
	MAE	435		Y			May Audit?	Y		
Title	Special Topics in Mechanical and Aerospace Engineering						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.		
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.						Website			
							Final Exam Type	Other		
							Grading	Perc.	Type	
								50	Design Project(s)	
								25	Oral Presentation(s)	
								25	Precept Participation	

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days Day	TBA?	Instructors First	Middle	Last
	L	01	O	30	20078	15:00:00	16:20:00	EQUAD D221	M W	N	Daniel	Mark	Nosenchuck

Course 1

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

Title	Introduction to Innovation Process Management
Topic	
Subletter	

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

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.

Sample Reading List

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

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Beg. Time	End Time	Place	Days/Day	TBA?	First	Middle	Last
L	01	O	30	22100	11:00:00	12:20:00	FRIEN 108	T Th	N	Karl	H.	Zaininger

Course 2

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

Title	Applied Dynamical Systems
Topic	
Subletter	

Max. Enrollment	30
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

Grading	Perc.	Type

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.

Sample Reading List

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

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Beg. Time	End Time	Place	Days/Day	TBA?	First	Middle	Last
L	01	O	30	20316	13:30:00	14:50:00	FINEH 110	T Th	N	Clarence	Worth	Rowley

Course 1

Course Codes	Code	Number	Subletter	Home Dept?
	MAE	542		Y

Max. Enrollment	30
May PDF?	N
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

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.

Grading | Perc. | Type

Sample Reading List

Author Name	Title
H. Goldstein	Classical Mechanics
V.I. Arnold	Mathematical Methods of Classical Mechanics
C. Lanczos	The Variational Principles of Mechanics

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Beg. Time	End Time	Place	Days / Day	TBA?	First	Middle	Last
S	01	O	30	20317	11:00:00	12:20:00	EQUAA A224	T Th	N	N.	Jeremy	Kasdin

Course 2

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

Max. Enrollment	30
May PDF?	Y
May Audit?	Y
Assignments	
Website	
Final Exam Type	Other

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.

Grading | Perc. | Type

Sample Reading List

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

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Beg. Time	End Time	Place	Days / Day	TBA?	First	Middle	Last
C	01	O	30	21697	10:00:00	10:50:00	JADWH A07	M W F	N	Nathaniel Hong	J.	Fisch Qin

Course 1

Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	30	
						May PDF?	N	
	GEO	425		Y		May Audit?	N	
	MAE	425		N		Assignments	Three to four problems every two weeks.	
Title	Introduction to Physical Oceanography					Website		
Topic						Final Exam Type	Final	
Subletter						Grading	Perc.	Type
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.						20	MidTerm Exam
							40	Final Exam
							40	Problem Set(s)

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

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days / Day	TBA?	Instructors First	Middle	Last
	L	01	O	30	20027	10:00:00	10:50:00	GUYOT 154	M W F	N	Anand		Gnanadesikan

Course 2

Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	20	
						May PDF?	N	
	MAE	521		Y		May Audit?	Y	
Title	Optics and Lasers					Assignments		
Topic						Website		
Subletter						Final Exam Type	Other	
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.					Grading	Perc.	Type

Sample Reading List	Author Name	Title
	Eckbreth, Alan C	Laser Diagnostics for Combustion Temperature & Species

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days / Day	TBA?	Instructors First	Middle	Last
	L	01	O	20	20312	13:30:00	14:20:00	EQUAJ J201	M W F	N	Richard	Bryant	Miles

Course 3

Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	20	
						May PDF?	N	
	MAE	551		Y		May Audit?	Y	
Title	Fluid Mechanics					Assignments		
Topic						Website		
Subletter						Final Exam Type	Other	
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.					Grading	Perc.	Type

Sample Reading List	Author Name	Title

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days / Day	TBA?	Instructors First	Middle	Last
	L	01	O	20	20318	10:00:00	11:20:00	EQUAJ J201	M W F	N	Garry	Leslie	Brown

Course 1

Course Codes	Code	Number	Subletter	Home Dept?
	CEE	361		Y
	MAE	325		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.	Type
30	MidTerm Exam
30	Design Project(s)
40	Problem Set(s)

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

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Beg. Time	End Time	Place	Days / Day	TBA?	First	Middle	Last
L	01	O	20	20236	11:00:00	12:20:00	FRIEN 109	T Th	N	Jean-Herve		Prevost
P	01	O	30	22365	19:30:00	22:20:00	FRIEN 007	Th	N	Nima		Rahbar
										Jean-Herve		Prevost
										Scott	Edward	Sanborn
P	02	X	25	22366	19:30:00	22:20:00	MCCOH B59	M	N	Nima		Rahbar

Course 2

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

Perc.	Type

Sample Reading List	Author Name	Title

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Beg. Time	End Time	Place	Days / Day	TBA?	First	Middle	Last
S	01	O	20	23080	19:00:00	22:00:00	ROBEH 015	M	N	Robert	Harry	Socolow

Course Codes

Code	Number	Subletter	Home Dept?
MAE	527		Y

Max. Enrollment	15
May PDF?	N
May Audit?	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.

Assignments	
Website	
Final Exam Type	Other
Grading	Perc. Type

Sample Reading List	Author Name	Title

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days Day	TBA?	Instructors First	Middle	Last
L	01	O	15	20313	09:00:00	09:50:00	EQUAJ J201	M W F	N	Szymon		Suckewer

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Course Codes

Code	Number	Subletter	Home Dept?
MAE	531		Y

Max. Enrollment	15
May PDF?	N
May Audit?	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.

Assignments	
Website	
Final Exam Type	Other
Grading	Perc. Type

Sample Reading List	Author Name	Title
	SR Turns	An Introduction to Combustion; Concepts and Applications
	I Glassman	Combustion
	K. Kikao	Principles of Combustion

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days Day	TBA?	Instructors First	Middle	Last
L	01	O	15	20314	15:00:00	16:20:00	FRIEN 202	M W	N	Chung	King	Law

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Course Codes

Code	Number	Subletter	Home Dept?
MAE	555		Y

Max. Enrollment	15
May PDF?	Y
May Audit?	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

Assignments	
Website	
Final Exam Type	Other
Grading	Perc. Type

Sample Reading List	Author Name	Title
	GA Bird	Molecular Gas dynamics and direct simulation
	WG Vincenti & CH Kruger Jr	Introduction to Physical Gas Dynamics

Sections

Format	Number	Status	Max. Enrollment	SCORE Number	Meetings Beg. Time	End Time	Place	Days Day	TBA?	Instructors First	Middle	Last
L	01	O	15	20315	11:00:00	12:20:00	FRIEN 306	M Th	N	Yiguang		Ju

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Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	15		
						May PDF?	N		
	MAE	553		Y		May Audit?	Y		
Title	Turbulent Flow					Assignments			
Topic						Website			
Subletter						Final Exam Type	Other		
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.					Grading	Perc.	Type	

Sample Reading List	Author Name					Title			

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings					TBA?	Instructors		
						Beg. Time	End Time	Place	Days / Day			First	Middle	Last
	L	01	O	15	20319	11:00:00	12:20:00	EQUAJ J201	T Th	N		Alexander	John	Smits

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Course Codes	Code	Number	Subletter	Home Dept?		Max. Enrollment	15		
						May PDF?	N		
	MAE	564		Y		May Audit?	Y		
	MSE	512		N		Assignments			
Title	Structural Materials					Website			
Topic						Final Exam Type	Other		
Subletter						Grading	Perc.	Type	
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.								

Sample Reading List	Author Name					Title			

Sections	Format	Number	Status	Max. Enrollment	SCORE Number	Meetings					TBA?	Instructors		
						Beg. Time	End Time	Place	Days / Day			First	Middle	Last
	L	01	O	15	23592	15:00:00	16:20:00	COMPU 102	T Th	N		Winston	Oluwole	Soboyejo