

Spring 2012

Registration Announcement



The University of Tennessee

Space Institute

411 B. H. Goethert Parkway

Tullahoma, TN 37388-9700

888-822-8874 ext. 37228

www.utsi.edu



Spring 2012

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Publication Number: E02-4001-002-12

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CALENDAR - 2012 SPRING SEMESTER

Priority Registration.....	October 10, 2011 – January 9, 2012
Admission to Candidacy Forms for Spring 2012 Commencement	November 29, 2011
Spring 2011 Graduation Application Deadline	November 29, 2011
Late Registration and late fees begin	January 11, 2012
Classes begin.....	January 11, 2012
Last Day to Late Register, Add, Change Grading Options or Drop Without a “W”	January 20, 2012
Martin Luther King Holiday	January 16, 2012
Graduation Fee Payment Deadline (MS \$30, PhD \$75).....	March 2, 2012
Preliminary Thesis/Dissertation Review Deadline	March 30, 2012
Last day to schedule final exam (thesis)	March 26, 2012
Last day to schedule final exam (non-thesis/capstone students).....	March 26, 2012
Spring Break (No Classes).....	March 19 - 23, 2012
Last day to schedule final exam (dissertation).....	March 30, 2012
Purchase cap and gown and order hood.....	TBD
Register to attend the Graduate Hooding Ceremony (http://gradschool.utk.edu)	March 30, 2012
Drop with a “W”	April 3, 2012
Last day to take final exam (thesis/dissertation students).....	April 9, 2012
Last day to take final exam (non-thesis/capstone students).....	April 9, 2012
Spring Recess (No Classes)	April 6, 2012
Electronic Thesis/Dissertation due in Knoxville (5:00 P.M. EST).....	April 20, 2012
Submit report of final examination (Pass/Fail) form	April 20, 2012
Deadline for Submission of Admission to Candidacy for students Graduating Summer 2012 and Graduation Application.....	TBD
Deadline for removing "INCOMPLETE" grades	April 27, 2012
Classes End	April 27, 2012
Total Withdraw from the University Deadline	April 27, 2012
Study Period.....	April 30, 2012
Exam Period.....	May 1, 2, 3, 2012
Graduate Hooding Ceremony (UTK)	May 10, 2012
COMMENCEMENT (UTK)	May 9 - 11, 2012
Second thesis/dissertation deadline (Student will receive diploma August 2012 but will not have to register for Summer 2012) (Defense Completed by April 27 th)	May 25, 2012

SUMMER SEMESTER 2012

Priority Registration.....	TBD
Final Registration	TBD
Memorial Day Holiday	May 28, 2012
Classes begin.....	May 31, 2012
July 4 th Holiday	July 4, 2012
Classes End	August 7, 2012
Summer Graduation Date on Transcript (No Ceremony).....	August 15, 2012

Dates may be revised without notice. Please refer to the following sites for updates:

<http://gradschool.utk.edu/ddategraduation.shtml>

http://registrar.tennessee.edu/academic_calendar/index.shtml

**SPRING SEMESTER 2012
FINAL STUDY DAY AND EXAM SCHEDULE**

LAST DAY OF CLASSES.....April 27, 2012

STUDY PERIODApril 30, 2012

FINAL EXAMS

REGULAR CLASS TIME	(Same Classroom)	EXAM TIME
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1st Day – Tuesday, May 1, 2012

7:45 - 9:00	M/Th	7:45 - 9:45
10:45 - 12:00	M/Th	10:15 - 12:15
9:15 - 10:30	M/Th	1:00 - 3:00
2:30 - 3:45	M/Th	3:30 - 5:30

2nd Day – Wednesday May 2, 2012

9:15 - 10:30	Tu/Fri	7:45 - 9:45
10:45 - 12:00	Tu/Fri	10:15 - 12:15
1:00 - 2:15	Tu/Fri	1:00 - 3:00
2:30 - 3:45	Tu/Fri	3:30 - 5:30

3rd Day – Thursday May 3, 2012

7:45 - 9:00	Tu/Fri	7:45 - 9:45
1:00 - 2:15	M/Th	10:15 - 12:15

**** ATTENTION ****

ALL STUDENTS TAKING VIDEOTAPE COURSES
CONTACT INSTRUCTOR FOR DATE AND TIME OF FINAL EXAM

NO CLASSES WILL BE IN SESSION
AT THIS TIME

REGISTRATION ANNOUNCEMENT SPRING SEMESTER 2012

REGISTRATION PROCEDURE

ADVISING

Graduate students should contact their departmental faculty to arrange an advising appointment. For students not accepted into specific programs, the Assistant to the Dean of Graduate Studies or his/her designee may act as advisor. The web registration system will ask if you have discussed your program with your advisor. Answer 'yes' if you have; otherwise, you cannot continue with the registration process. Graduate School Web Page: <http://gradschool.utk.edu/> .

REGISTRATION

Students will register at <http://myutk.edu>. You will need to log in using your NetID and your NetID password. If you do not know your NetID and NetID password, go to <http://registrar.utk.edu/registration.shtml> .

*Log in to MyUTK. You can find a link by looking under "M" on the A-Z index (<http://www.utk.edu/alpha/>) or by typing myutk.utk.edu directly into your browser. You will need to log in by typing utk\your NetID in the "username" field and then your NetID password in the "password" field.

*Before you attempt to register, clear and pay any financial holds (parking tickets, library fines, fees, etc.).

*Look under the "For Your Review" heading on the MyUTK portal page (located in the upper right-hand corner) for notification of any holds you may have.

*Once you are logged into "My UTK," scroll down to "UTK Student Links." Click on "Search for Classes" to look up sections and then register.

*Print a copy of your schedule when you are finished registering.

If you have any questions, call the Office of the University Registrar at 865-974-2101 or contact Charlene Hane in Student Services room D-100, phone 931-393-7228, email chane@utsi.edu.

FINANCIAL CALENDAR FOR SPRING TERM 2012

Statement information available on MyUTK.UTK	November 30, 2011
Priority Registration Payment/Confirmation Deadline	January 9, 2012 at 4:30 p.m. (EST)
Late Registration/Late Fees Begin	January 11, 2012
Late Registration Payment/Confirmation Deadline	January 20, 2012 at 4:30 p.m. (EST)

NOTE: PAYMENT AND THE CONFIRMATION OF ATTENDANCE FORM MUST BE RECEIVED BY THESE DEADLINES WHETHER OR NOT YOU HAVE RECEIVED A VolxPress e-STATEMENT. You may view your account at MyUTK.

FINAL/LATE REGISTRATION PERIOD

January 11 – 17, 2012	\$20 Fee
January 18 – 24, 2012	\$40 Fee
January 25 – 31, 2012	\$60 Fee
February 1 – 7, 2012	\$80 Fee
February 8, 2012 – forward	\$100 Fee

CREDIT CARD PAYMENTS

**** NOTE:** If you pay your fees using MyUTK with a credit/debit card (Discover, VISA, Mastercard) you will be assessed a 2.5% service fee. To avoid this service fee you will need to make payment to the UTSI Budget and Finance Office.

SPECIAL BILLING – THIRD PARTY BILLING:

The Budget and Finance Office will generate a billing after the student has provided a letter of authorization from the third party sponsor. Authorization must include the sponsor's name and address as well as the maximum amount which will be paid for each specific term. The authorization can be mailed to UTSI Budget and Finance Office, MS#12, 411 B.H. Goethert Parkway, Tullahoma, TN 37388-9700 or email it to jboyles@utsi.edu. Since students are responsible for all University fees and charges, use of the third-party address as the student's billing address is strongly discouraged.

STUDENTS ARE ULTIMATELY RESPONSIBLE FOR ALL CHARGES. THEY MUST COMPLETE A CONFIRMATION OF ATTENDANCE FORM AND MAKE CERTAIN MINIMUM PAYMENT AMOUNTS CREDITED OR AUTHORIZED ON OR BEFORE THE PAYMENT DUE DATE IN ORDER TO AVOID LATE PAYMENT FEE ASSESSMENT AND SCHEDULE CANCELLATION.

If you have any questions concerning third-party billing please call Jennifer Boyles at 931-393-7297 or 888-822-8874 ext 37297 or by email jboyles@utsi.edu

TOLL-FREE NUMBERS

For a specific office:	1-888-822-UTSI (8874) and the extension number.
For general information:	1-888-822-UTSI (8874)
Admissions Office:	1-888-822-UTSI (8874)-37213
Budget and Finance Office:	1-888-822-UTSI (8874)-37297
Student Services	1-888-822-UTSI (8874)-37228

APPLICATION FOR ADMISSION

No student will be allowed to register unless a completed Application for Admission to the Graduate School of the University of Tennessee, Knoxville (UTK) is on file in the Registrar's Office. An Application for Admission to the UTK Graduate School must be accompanied by a \$60.00 non-refundable application fee, payable to The University of Tennessee Space Institute. Applicants are required to provide one official transcript of all undergraduate and graduate records. Students may apply on-line at <http://admissions.utk.edu/graduate/apply.shtml> [click on APPLY ONLINE and Follow Directions]. Send Applications for Admission, transcripts, GRE scores (if required); and if international application, TOEFL scores to the Admissions Office, A-200, Mail Stop 1, UTSI, Tullahoma, TN 37388-9700.

PAYMENT OF FEES

Late fees will begin on January 11, 2012. The only credit/debit cards The University of Tennessee Space Institute accepts are Visa, MasterCard and Discover.

NEW FOR FALL 2011

In February 2011, a new fee structure for students who are enrolled in dual campus locations was approved beginning Fall 2011. The University of Tennessee, Knoxville allows students to enroll in multiple campuses which include the following: Knoxville, UTSI, Distance Education, Nashville School of Social Work and off-campus locations. Students enrolling in dual campus locations will be assessed all fees for each campus they are enrolled. For example, students enrolled in classes on the Knoxville campus and also taking Distance Education courses will be assessed the per hour rate of all the fees for the Knoxville campus (Maintenance, Out-of-State Tuition, Programs and Service, Health, Technology, Facilities, Transportation, and any course fees that may be associated with a particular class) and the per hour rate of all the fees for the Distance Education courses (Maintenance, Out-of-State Tuition, the Distance Education Course Fee, and any course fees that may be associated with a particular course). The Out-of-State Tuition will be charged only to students who are classified as out-of-state per the appropriate Admissions Office.

FEES OF DISTANCE STUDENTS

Distance students should contact their departmental coordinator to determine the amount of the access fee.

Aviation Systems	Stephen Corda	931-393-7413	scorda@utsi.edu
Engineering Mgt.	Charlotte Henley	931-393-7293	chenley@utsi.edu

TUITION AND/OR MAINTENANCE FEES*

Full Fees For In-State Students (per semester)

Maintenance Fee	\$4,166.00*
Programs and Services Fee	90.00
Total	\$4,256.00

Full Fees For Out-Of-State Students (per semester)*

Maintenance Fee	\$4,166.00*
Programs and Services Fee	90.00
Tuition	\$8,421.00*
Total	\$12,677.00

Fall 2011 an additional \$50.00 per credit hour with no cap will be charged to ALL ENGINEERING COURSES (including courses that are cross-referenced).

***All fees are subject to changes approved by the Board of Trustees prior to the beginning of the term.**

TUITION FOR PART-TIME STUDENTS

Part time students may elect to pay fees computed by the semester hour credit as follows:

IN-STATE	\$464.00 per semester hour
3 hours	\$1,392.00
OUT-OF-STATE	\$1,400.00 per semester hour
3 hours	\$4,200.00

ENGINEERING FEE

On July 1, 2007, the Computer Science Department merged with the Engineering Department. Beginning Fall 2008, a special per credit hour fee will be assessed on engineering and computer science courses offered through the College of Engineering and the College of Agricultural Sciences and Natural Resources. The additional funds will be used to acquire state-of-the-art equipment, expand first-year programs for Engineering students, and provide faculty with professional development opportunities to bring the latest knowledge into the classroom. The Colleges will retain the funds generated from this fee for their use.

PROGRAMS AND SERVICES FEE

All students enrolled in nine semester hours or more for Fall or Spring Semester are assessed an activity fee of \$90.00 per semester. Part-time students taking fewer than nine hours will be assessed at the rate of \$10.00 per semester hour. The Programs and Services Fee is non-refundable. Research assistants and fellowship/scholarship students who may have a waiver of fees (tuition), must pay appropriate University Programs and Services Fee.

Part-time students enrolled for recorded classes at off campus centers and students residing out of state are not required to pay the Programs and Services Fee.

RETURNED CHECK POLICY

All checks are deposited the day they are received. A \$30.00 service charge will be assessed when checks fail to clear the bank on which drawn. In addition, if the returned check is in payment of initial fees and charges, the late payment fee in effect at the time the check is redeemed will be added to the returned check service fee. Returned checks will not be re-deposited. Cash or a cashier's check is required for payment of a returned check, late fee, and service charges. Failure to clear returned checks will result in the forfeiture of all University services including the receipt of grades, transcripts, and schedules of classes.

DEFERRED PAYMENT PLAN

Although fees, rent and other University expenses are due and payable at the beginning of each term, a full-time student in good financial standing with a definite anticipated source of funds may request the deferment of up to 50% of the total charges at registration. The remaining balance for the term is due approximately 45 days after the first due date. All financial aid monies must be applied to fees before a deferment will be considered. A deferred payment service fee of \$20.00 is assessed when any portion of tuition, fees, and other charges are deferred with the approval of the Business Office. An additional \$35.00 late payment charge will be assessed if the second installment is not paid on or before the due date. For more details, contact the Business Office.

LATE PAYMENT FEES

A **Late Payment Fee** of \$35.00 will be added to each *VOLXpress* account if the minimum payment amount which is printed on the statement is not received by the Bursar's Office on or before the published due date. This does not include beginning of term registration statements which will result in cancellation of schedules if the minimum payment is not met. Late payment fees are exclusive of all other charges and are due when assessed whether or not the student receives a *VOLXpress* statement. Accounts are subject to a late fee of \$45.00 if there is an account balance at mid-semester. The fee is assessed in addition to the unpaid fees and charges and the account balance must be paid in order to access registration services, receive a transcript, grades, or a diploma.

TUITION/FEES POLICY FOR DROPPED COURSES OR WITHDRAWAL

THE PERCENTAGE TUITION REFUNDS SPECIFIED ON THE FOLLOWING PAGE ARE APPLICABLE WHEN A STUDENT DROPS ONE OR MORE COURSES (INCLUDING TOTAL WITHDRAWAL). Students who drop courses and continue with a reduced course load are eligible for a refund only if the total charges at the semester hour rate for the courses continued plus the percentage assessed at the semester hour rate for the courses dropped results in an amount less than that paid. The Programs and Service Fee is non-refundable.

A COURSE IS NOT OFFICIALLY DROPPED UNTIL A CHANGE OF REGISTRATION FORM HAS BEEN PROCESSED BY THE REGISTRAR'S OFFICE. CANCELED COURSES OR FAILURE TO ATTEND CLASS DOES NOT AUTOMATICALLY WITHDRAW OR DROP A STUDENT FROM THE UNIVERSITY OR CLASS -- A CHANGE OF REGISTRATION FORM MUST BE COMPLETED.

The following percentage assessments are applicable for courses dropped (if fees are assessed at the semester hour rate):

DROP DATE	CHARGE	REFUND
January 11 – 15, 2012	NO CHARGE	100%
January 16 – 21, 2012	20% CHARGE	80%
January 22 – 26, 2012	40% CHARGE	60%
January 27 – 31, 2012	60% CHARGE	40%
February 1, 2012 - End of Term	100% CHARGE	NO REFUND

TUITION/FEE REFUND POLICY FOR WITHDRAWALS

Withdrawal from school for the term after registration has been processed, even though classes have not been attended or fees paid, must be by official notification to the Registrar's office. The effective date of withdrawal is the date the Registrar's office is notified by completion of the Change of Registration request form. **FAILURE TO ATTEND CLASS DOES NOT AUTOMATICALLY CANCEL ENROLLMENT.** The appropriate percentage of fees will be charged unless the Registrar's Office is notified by the close of the last day designated for registration and before the first official day of classes for the semester or term. **WITHDRAWAL DOES NOT CANCEL FEES AND CHARGES ALREADY INCURRED. THE DROP/ADD PROCEDURE CAN NOT BE USED TO WITHDRAW FROM SCHOOL FOR THE SEMESTER OR TERM.** When a course is canceled by UTSI administration, the students who have registered for the course will be notified by either the instructor and/or Charlene Hane, Student Services. Any questions concerning registration, please contact Charlene Hane, UTSI, Office D-100, 931-393-7228.

The University of Tennessee Space Institute, in accordance with federal regulations, follows the policy and procedures below for calculating refunds and repayments for financial aid.

REFUNDS

Refunds are defined as the portion of maintenance and/or tuition and University housing charges due as rebate when a student withdraws or is expelled from the University. The amount of a refund is determined by the Drop Date Charge fee table.

REPAYMENTS

Repayments are defined as that portion of aid, received by a student after the University direct charges have been paid by that aid, which must be repaid by a student when a student withdraws or is expelled. The amount of the repayment is determined by the Drop Date Charge fee table.

Refunds and repayments to the Title IV programs are determined according to the formula published in the current Federal Student Financial Aid Handbook. The Business and Admissions Offices are responsible for determining the amount of the refund and/or repayment and distributing the correct amount back to the financial aid programs according to the Refund/Repayment Allocation Policy.

WITHDRAWAL (TOTAL) FROM THE UNIVERSITY

If, after registering for classes and either returning your fee payment or your Confirmation of Attendance form to the Bursar's Office, you decide not to enroll for this term, you must immediately notify Charlene Hane, Student Services, at UTSI. If you withdraw officially on or before a Change of Registration deadline, but after the no "W" deadline for a particular session, the grade of "W" will be issued.

GRADES

Students may obtain their grades through the web at MyUTK or contact Charlene Hane, Student Services, Office D-100, (931) 393-7228.

GRADUATE STUDENTS CHANGE OF REGISTRATION AFTER THE DEADLINE

To change registration in any way after the deadline, a graduate student must present a request, signed by the instructor(s) and adviser as evidence of their knowledge of the request to Charlene Hane, Student Services at UTSI. Graduate students must verify that ALL changes have been approved by their academic adviser. If the Office of Graduate Student Services approves the change of registration, the change will be noted on the student's permanent record. **THE DROP DEADLINE FOR GRADES AND THE DROP DEADLINE FOR FEE REFUNDS ARE NOT THE SAME.**

FULL-TIME STUDENTS

Students enrolled in at least 9 semester hours during the Fall/Spring semesters or 6 hours in the Summer Term are considered full-time students. Research Assistants must be full-time students and also enroll in one of the MABE 595 seminars or a PHYS 599 seminar each term, unless a waiver is granted by the Associate Executive Director.

REMOVAL OF INCOMPLETE GRADES

All Incomplete Grades (I) must be removed prior to graduation. The instructor, in consultation with the student, decides the terms for the removal of the I, including the time limit for removal. If the I is not removed within one calendar year, the grade will be changed to an F. The course will not be counted in the cumulative grade point average until a final grade is assigned. No student may graduate with an I on the record. Students planning to graduate Fall Semester 2011 must remove all INCOMPLETE GRADES by **April 27, 2012**. Contact Charlene Hane, Student Services, to remove an Incomplete Grade.

REPEATING A COURSE

No graduate student may repeat a course for the purpose of raising a grade already received, with the exception of a NC course. A graduate student cannot do additional work nor repeat an examination to raise a final grade.

ADMISSION TO CANDIDACY

MASTER OF SCIENCE DEGREE:

Each M.S. student, including IE Capstone Project students, is responsible for submitting a completed and signed Admission to Candidacy Application at least one semester prior to receiving the degree.

Candidacy committee changes or course changes must be submitted to the committee chairman using a Revision form. If changing from a thesis option to a non-thesis option or vice versa, a new Admission to Candidacy Application must be submitted. All forms must be processed through Student Services.

DOCTORAL DEGREE:

A Doctoral Committee should be formed during the student's first year of doctoral study. Any changes to the doctoral committee (deletions or additions) must be submitted to the Committee Chairman using a Revision form for approval. Each doctoral student is responsible for submitting a completed Admission to Candidacy form signed by the doctoral committee at least one semester prior to receiving the degree. All forms must be processed through Student Services.

CONTINUOUS REGISTRATION OF DOCTORAL STUDENTS

All doctoral students must be registered for doctoral dissertation research course 600 (minimum of 3 hrs.) on a continuous basis starting when the doctoral research proposal is approved, admission to candidacy is accepted, or registration for course 600 is begun, whichever comes first, including ALL Summer terms and the semester in which the dissertation is approved and accepted by The Graduate School. A leave of absence may be requested for extenuating circumstances. The procedure can be found in the UTK Graduate catalog.

FINAL EXAMINATION FOR NON-THESIS, CAPSTONE PROJECT STUDENTS, THESIS AND DISSERTATION STUDENTS

A candidate presenting a thesis or dissertation must pass a final oral examination on all work offered for the degree. The examination is scheduled through Student Services. Failure to notify Student Services of the examination date will put the student at risk for graduating that semester. Final examinations not properly scheduled **MUST** be repeated. The final draft of the thesis must be distributed to the committee members at least two weeks prior to the date of the final

examination. In case of a grade of "Fail", the candidate may not apply for re-examination until the following semester. The result of the second examination is final.

UT POLICY ON INSURANCE FOR INTERNATIONAL STUDENTS

All foreign national students registered with the University of Tennessee, Knoxville, are required to have comprehensive medical insurance. The policy for the 2011-2012 academic year is provided by Aetna. The premium must be paid before registration. Contact the Human Resources Office (A-104 ext. 37267) for further information.

GENERAL SEMINAR

A number of seminars of interest to all UTSI students and general public will be offered throughout the semester.

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A number of seminars of interest to all UTSI students and general public will be offered throughout the semester.

FINAL EXAM DATES FOR SPRING SEMESTER 2012

STUDY PERIOD.....April 30, 2012
FINAL EXAMSMay 1, 2, and 3, 2012

HONOR STATEMENT

The following Honor Statement is signed by all students applying to The Graduate School:

"An essential feature of The University of Tennessee, Knoxville is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity."

For official information on all UTK Graduate School policies, refer to the current UTK Graduate Catalog available from Charlene Hane, Student Services, D-100.

The University of Tennessee Space Institute reserves the right to cancel any class with an insufficient number of students, or for other reasons.

THE UNIVERSITY OF TENNESSEE POLICY ON A DRUG-FREE CAMPUS AND WORKPLACE

In support of the Drug-Free Workplace Act of 1998 (Public Law 100-690) and the Drug-Free Schools and communities Act of 1989, the University of Tennessee is notifying all students, faculty, and staff of the following university policy approved by the UT Board of Trustees on 21 June 1990.

It is the policy of the University of Tennessee to maintain a safe and healthful environment for its students and employees. Therefore, university policy prohibits the unlawful use, manufacture, possession, distribution, or dispensing of drugs ("controlled substances" as defined in the Controlled Substances Act, 21 U.S.C. 812) and alcohol on university property or during university activities.

Violation of this policy is grounds for disciplinary action--up to and including immediate discharge for an employee and permanent dismissal of a student. Federal and state laws provide additional penalties for such unlawful activities, including fines and imprisonment (21 U.S.C. 841 et seq.; T.C.A. 39-6-401 et seq.). Local ordinances also provide various penalties for drug- and alcohol-related offenses. The university is bound to take all appropriate actions against violators, which may include referral for legal prosecution or requiring the individual to participate satisfactorily in an approved drug use or alcohol abuse assistance or rehabilitation program.

SPECIAL ANNOUNCEMENT

THOMAS JEFFERSON LECTURE

April, 2012 (Tentative)

3:00 P.M.

UTSI Auditorium

There will be **NO** scheduled classes at this time by request of
Dr. Buddy Moore, Executive Director of the University of Tennessee Space Institute

Faculty will reschedule any afternoon classes tentatively scheduled for
April, 2012 (Tentative) between 2:30 – 3:45 p.m.
Contact Charlene Hane, Student Services
for available times and rooms for rescheduling

**THE UNIVERSITY RESERVES THE RIGHT TO REVISE
ANY INFORMATION LISTED IN THIS TIMETABLE OF CLASSES**

**The University of Tennessee Space Institute
Spring 2012 Course Listings**

AEROSPACE ENGINEERING

AE	500	Thesis (1-15)	
	009	CRN 25688	Antar
	021	CRN 25700	Corda
	024	CRN 28247	Flandro
	011	CRN 25690	Majdalani
	012	CRN 25691	Moeller
	015	CRN 25694	Moulden
	030	CRN 28690	Schulz
	022	CRN 27755	Solies
	013	CRN 25692	Steinhoff
	014	CRN 25693	Vakili

AE	502	Registration for Use of Facilities (1-15)	
SEC.	002	CRN 25702	Moeller

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

AE	512	Viscous Flow (3)	
SEC.	001	CRN 25703	
TEXT:	Frank M. White; <i>Viscous Flow</i> ; 3 rd Ed.		
TIME:	Monday & Thursday	8:30 – 9:45	E-111
PROFESSOR:	Dr. Ahmad Vakili		

Derivation of fundamental equations of compressible viscous flow; boundary conditions for viscous heat-conducting flow; exact solutions for Newtonian viscous flow (Navier-Stokes) equations for special cases; similarity solutions. Thermal boundary layers, stability of laminar flows, transition to turbulence, 2-D turbulent boundary layer equations. Incompressible-turbulent mean flow, and compressible boundary layer flow.

Registration Permission: Consent of instructor.

AE 522 Aerodynamics of Compressible Fluids II (3)
SEC. 001 CRN 28699
TEXT: TBD
TIME: Monday & Thursday 1:00 – 2:15 F-252
PROFESSOR: Dr. Trevor Moeller

One-dimensional internal and external flow; waves; small perturbation theory; slender body theory; similarity rules; method of characteristics.
(DE) Prerequisite(s): 521.

AE 539 Continuum Mechanics (3) (Same as BME 539/ES 539/ME 542)
SEC. 002 CRN 29439
TEXT: TBD
TIME: Monday & Wednesday 2:30 – 3:45 E-111
PROFESSOR: Dr. Trevor Moulden

Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics.
Cross-listed: (Same as Biomedical Engineering 539; Engineering Science 539 Mechanical Engineering 539.)

AE 542 Fluid Mechanics II (3) (Same as ES 542/ME 542)
SEC. 001 CRN 25707
TEXT: R. L. Panton; *Incompressible Flow*; 3rd Edition; John Wiley;
TIME: Tuesday & Friday 9:15 – 10:30 E-211
PROFESSOR: Dr. Basil Antar

Equations of viscous fluid flows. Basic concepts and equations of turbulent flow. Separation, stability and transition. Laminar and turbulent boundary-layer flows. Exact, approximate, and numerical solutions.
Cross-listed: (Same as Engineering Science 542; Mechanical Engineering 542.)
(DE) Prerequisite(s): 541.

AE 562 Fundamentals of Aeroacoustics (3)
SEC. 001 CRN 27418 (Video Recorded)
TEXT: Class Notes
TIME: Monday & Wednesday 4:00 – 5:15 E-111
PROFESSOR: Dr. Joseph Majdalani

Generation, propagation and absorption of sound in static and moving media.

The purpose of this course is to provide a broad coverage of the fundamentals of the theory and measurement of acoustics and noise ranging from the production of sound from vibrations and waves, acoustical devices, aeroacoustics, sound in enclosed spaces, etc.
Registration Permission: Consent of instructor.

AE 590 Selected Engineering Problems (3)
 SEC. 001 CRN 25709 Antar
 004 CRN 28706 Corda
 005 CRN 28707 Flandro
 006 CRN 28708 Majdalani
 007 CRN 28709 Moeller
 008 CRN 28710 Schulz
 009 CRN 28711 Solies
 010 CRN 28712 Steinhoff
 003 CRN 25710 Vakili

Repeatability: May be repeated. Maximum 6 hours.
Comment(s): Enrollment limited to students in problems option.
Registration Permission: Consent of advisor.

AE 595 Aerospace Engineering Seminar (1)
 SEC. 001 CRN 25711
 TEXT: None
 TIME: Will be announced through email
 PROFESSOR: Dr. Ahmad Vakili

All phases of aerospace engineering, reports on current research at the University of Tennessee, Knoxville, and UTSI.

Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum

*AE 599 Special Topics in Aerospace Engineering: Aircraft Design (3) (Same as AS 506) **CANCELLED**
 SEC. 001 CRN 25713 (Video Recorded)
 TEXT: D. P. Raymer; *Aircraft Design: A Conceptual Approach*; AIAA Education Series, 3rd Edition
 1998, or later; ISBN 1-56347-281-0
 TIME: Tuesday & Friday 1:00 – 2:15 E-111
 PROFESSOR: Dr. Peter Solies

Design process, compromise of conflicting requirements, economical, industrial, and legal aspects.
 Definition of mission requirements, synthesis and optimization techniques, safety and reliability, systems integration, standards and regulations, teamwork, and decision-making process.

Repeatability: May be repeated. Maximum 6 hours.

*AE 599 Special Topics in Aerospace Engineering: Hybrid Rocket Propulsion (3) (ME 599) **CANCELLED**
 SEC. 005 CRN 28420
 TEXT: Class Notes
 TIME: Monday & Thursday 1:00 - 2:15 B-112
 PROFESSOR: Dr. Joseph Majdalani

This course reviews the fundamentals of hybrid rocket propulsion with special emphasis on application-based design and system integration, propellant selection, flow and regression rate modeling, solid fuel pyrolysis, scaling effects, transient behavior, and combustion instability. Advantages and disadvantages of both conventional and swirl-driven vortex hybrid configurations are examined. Course includes testing of laboratory-scale hybrid rockets.

Prereq: ME 581 or consent of instructor.

AE 599 Special Topics in Aerospace Engineering: Aircraft Flight Controls (3) (Same as AS 516)
 SEC. 008 CRN 29829 (Video Recorded)
 TEXT: Nelson, Robert C; *Flight Stability and Automatic Control*; 2nd Edition; McGraw-Hill, NY, 1998.
 TIME: Tuesday & Friday 1:00 – 2:15 E-111
 PROFESSOR: Dr. Peter Solies

Feedback control concepts, root locus techniques, bode analysis, PID control design, and controller and observer design concepts applied to aircraft. Complex analysis and matrix algebra.

Static and dynamic longitudinal, directional, and lateral stability of aerospace vehicles will be investigated. Topics include:

- *Contribution of vehicle components to stability and control
- *Motion with fixed and free control surfaces
- *Steady flight and maneuvering flight
- *Flight test techniques
- *Introduction to control theory and design of automatic controls

AE 600 Doctoral Research and Dissertation (3-15)
 SEC. 015 CRN 28714 Antar
 010 CRN 25726 Corda
 018 CRN 28248 Flandro
 007 CRN 25723 Majdalani
 006 CRN 25722 Moeller
 008 CRN 25724 Steinhoff
 017 CRN 25731 Vakili

AVIATION SYSTEMS

AS 500 Thesis (1-15)
 SEC. 001 CRN 25804 Corda
 003 CRN 25806 Martos
 004 CRN 25807 Muratore
 005 CRN 25808 Pujol
 006 CRN 25809 Solies

AS 502 Registration for Use of Facilities (1-15)
 SEC. 001 CRN 25810 Corda
 003 CRN 25812 Martos
 004 CRN 25813 Muratore
 005 CRN 25814 Pujol
 006 CRN 25815 Solies

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

*AS 506 Air Design (3) (Same as AE 599) **CANCELLED**
SEC. 001 CRN 25816 (Video Recorded)
TEXT: D. P. Raymer; *Aircraft Design: A Conceptual Approach*; AIAA Education Series, 3rd Edition
1998, or later; ISBN 1-56347-281-0
TIME: Tuesday & Friday 1:00 – 2:15 E-111
PROFESSOR: Dr. Peter Solies

Design process, compromise of conflicting requirements, economical, industrial, and legal aspects. Definition of mission requirements, synthesis and optimization techniques, safety and reliability, systems integration, standards and regulations, teamwork, and decision-making process.

AS 510 Special Topics in Aviation Systems: Introduction in Avionics II (3)
SEC. 001 CRN 25817 (Video Recorded)
TEXT: Len Buckwalter; *Avionics Training: Systems, Installation and Troubleshooting*; Avionics
Communications Inc.; Latest Edition; ISBN 1-88-5544-21-9
TIME: Tuesday & Friday 10:30 – 11:45 E-113
PROFESSOR: Dr. Alfonso Pujol, Jr.

Avionic systems and communications, including analog and digital systems, distance measuring equipment, transponder, radar altimeter, GPS/satellite navigation, electronic flight instrument system, cockpit voice and flight data recorders, weather detection, traffic alert and collision avoidance system, electrical systems, aviation bands and frequencies, and other topics are also discussed.
Current problems.

Repeatability: May be repeated. Maximum 15 hours.

Credit Restriction: Maximum of 12 hours may be applied toward degree requirements.

Registration Permission: Consent of instructor.

AS 510 Special Topics in Aviation Systems: Systems Engineering (3)
SEC. 002 CRN 25818 (Video Recorded)
TEXT: James R. Chiles and Stephen B. Johnson; *Inviting Disaster – Lessons from the Edge of
Technology; The Secret of Apollo, Systems Management in the American and European Space
Programs*; ISBN 0-06-662081-3 and ISBN 0-8018-8542-6
TIME: Monday & Thursday 8:30 – 9:45 E-111
PROFESSOR: Dr. Peter Solies

The focus of this course is on engineering problem solving in multi-disciplinary applications with complex systems interactions. Instruction will be provided in methodologies and tools used to deal with large complex systems to deliver system performance that meets user requirements. Methodologies discussed will include system life cycles, requirements development, verification and validation, engineering review processed, hazard analysis, fault trees, reliability block diagrams, system flow diagrams, weight and cost estimating, technical budget management, engineering economic analysis, interface control, and deterministic and monte carlo definition of integrated flight design environments. Special topics will include software integration; interconnect wiring, fault tolerance and redundancy management.
Current Problems.

Repeatability: May be repeated. Maximum 15 hours.

Credit Restriction: Maximum of 12 hours may be applied toward degree requirements.
Registration Permission: Consent of instructor.

AS 516 Aircraft Flight Controls (Stability and Control) (Same as AE 599 008 crn 29829) (3)
SEC. 001 CRN 25819 (Video Recorded)
TEXT: Nelson, Robert C; *Flight Stability and Automatic Control*; 2nd Edition; McGraw-Hill, NY, 1998.
TIME: Tuesday & Friday 1:00 – 2:15 E-111
PROFESSOR: Dr. Peter Solies

Feedback control concepts, root locus techniques, bode analysis, PID control design, and controller and observer design concepts applied to aircraft. Complex analysis and matrix algebra.

Static and dynamic longitudinal, directional, and lateral stability of aerospace vehicles will be investigated. Topics include:

- *Contribution of vehicle components to stability and control
- *Motion with fixed and free control surfaces
- *Steady flight and maneuvering flight
- *Flight test techniques
- *Introduction to control theory and design of automatic controls

AS 521 Experimental Flight Mechanics: Fixed Wing Performance (3)
SEC. 001 CRN 25820
TEXT: Ralph Kimberlin; *Flight Testing of Fixed Wing Aircraft*; AIAA; 1st Edition;
ISBN 1-56347-564-2
TIME: Tuesday & Friday 10:00 – 11:15 Airport Classroom
PROFESSOR: Borja Martos

Performance. Experimental techniques for flight mechanics. Specially equipped airborne laboratory: student participation in series of experiments demonstrating acquisition of flight test data. Necessary theory supports class experiments. Tests cover broad range of aircraft performance, stability and control characteristics in addition to instrumentation and data reduction methods.

(RE) Prerequisite(s): Aerospace Engineering 422.

AS 550 Project in Aviation Systems (3)
SEC. 001 CRN 25821 Corda
003 CRN 25823 Martos
004 CRN 25824 Muratore
005 CRN 25825 Pujol
006 CRN 25826 Solies

BIOMEDICAL ENGINEERING

BME 500 Thesis (1-15)
SEC. 012 CRN 29633 Johnson

BME 539 Continuum Mechanics (3) (Same as AE 539/ES 539/ME 539)
SEC. 002 CRN 29440
TEXT: TBD
TIME: Monday & Wednesday 2:30 – 3:45 E-111
PROFESSOR: Dr. Trevor Moulden

Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics.

Cross-listed: (Same as Aerospace Engineering 539; Engineering Science 539; Mechanical Engineering 539.)

BME 595 Seminar (1)
SEC. 002 CRN 29870
TEXT: None
TIME: Will be announced through email
PROFESSOR: Dr. Jackie Johnson

All phases of biomedical engineering, reports on current research at UTK and UTSL.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 20 hours.

BME 600 Doctoral Research and Dissertation (3-15)
SEC. 011 CRN 29634 Johnson

BME 610 Advanced Topics in BME: Biofunctionalization of Nanomaterials (3)
SEC. 003 CRN 29033
TEXT: Challa Kumar; *Biofunctionalization of Nanomaterials*;
TIME: Tuesday & Friday 2:30 – 3:45 F-252
PROFESSOR: Dr. Jackie Johnson

Current research topics of interest in biomedical engineering.

This course is the integration of nanomaterials and medicine and the exploration of potential future research projects in biomedical engineering. The course will progress from predominantly instruction to discussion on a potential proposal to be summarized in a 4-page white paper, a cover sheet, mock budget and biosketch – the students can either work as a group or individually. There will be no final exam.

Repeatability: May be repeated. Maximum 9 hours.

Registration Restriction(s): Minimum student level – graduate.

Registration Permission: Consent of instructor.

COMPUTER SCIENCE

*CS 472 Numerical Analysis II (3) (Same as Math 472) **CANCELLED**

SEC. 001 CRN 22803 (Video Recorded)
 TEXT: R.L. Burden and J.P. Faires; *Numerical Analysis*; 9th Edition; Thompson Brooks/Cole;
 ISBN 978-0-538-73351-9
 TIME: Monday & Wednesday 2:30 – 3:45 E-111
 PROFESSOR: Dr. Trevor Moulden

Direct and iterative methods for systems of linear equations. Solution of single nonlinear equation and nonlinear systems. Orthogonal decomposition, least squares and algebraic eigenvalue problem.

Cross-listed: (Same as Math 472.)

(RE) Prerequisite(s): 231; 200 or 251 or 257.

(DE) Prerequisite(s): 371.

Comment(s): Knowledge of a high-level programming language required.

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

ECE 500 Thesis (1-15)
 SEC. 006 CRN 22725 Bomar
 015 CRN 22734 Pujol
 018 CRN 22737 Smith
 022 CRN 27443 Whitehead

ECE 501 Project in Lieu of Thesis (3)
 SEC. 001 CRN 22740 Bomar
 003 CRN 22742 Pujol
 002 CRN 22741 Smith
 004 CRN 22743 Whitehead

ECE 502 Registration for Use of Facilities (1-15)
 SEC. 002 CRN 22746 Smith

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

ECE 600 Doctoral Research and Dissertation (3-15)
 SEC. 006 CRN 22766 Bomar

ENGINEERING MANAGEMENT

EM 501 Capstone Project (3-6)
 SEC. 001 CRN 23052 Dr. Greg Sedrick
 SEC. 002 CRN 23053 Dr. Denise Jackson

Application-oriented project to show competence in major academic area. Enrollment limited to Engineering Management students in non-thesis program.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 6 hours.

Comment(s): Requires enrollment in engineering management.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

EM 502 Registration for Use of Facilities (1-15)

SEC. 001 CRN 23054 Sedrick

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

EM 533 Theory and Practice of Engineering Management (3) (Video Recorded)

SEC. 001 CRN 23056 UTSI students participating at Tullahoma or Oak Ridge

002 CRN 23057 UTSI students participating elsewhere

003 CRN 23058 UTK students participating at Knoxville DE classrooms

004 CRN 23059 UTK students participating elsewhere

TEXT: http://www.utsi.edu/academics/ieandem/student_services.htm

TIME: Monday

4:00 - 6:35

E-113

PROFESSOR: Dr. Denise Jackson

Principles of engineering management, including: business and organization design, culture, leadership, marketing and competition in global economy, motivation and performance management, empowerment, organizational behavior, and diversity. Systems thinking, learning organizations, and systems dynamics modeling. Principle application to work settings and case studies.

EM 534 Financial Management for Engineering Managers (3) (Video Recorded)

SEC. 001 CRN 23060 UTSI students participating at Tullahoma or Oak Ridge

002 CRN 23061 UTSI students participating elsewhere

003 CRN 23062 UTK students participating at Knoxville DE classrooms

004 CRN 23063 UTK students participating elsewhere

TEXT: http://www.utsi.edu/academics/ieandem/student_services.htm

TIME: Tuesday

4:00 – 6:35

E-113

PROFESSOR: Dr. Gregory Sedrick

Financial and managerial accounting in engineering and technology management. Transaction recording, financial statements, ratios and analysis, activity-based accounting, and standard practices for costing, budgeting, assessment, and control.

EM 541 Managing Change and Improvement in Technical Organizations (3) (Video Recorded)

SEC. 001 CRN 23064 UTSI students participating at Tullahoma or Oak Ridge

002 CRN 23065 UTSI students participating elsewhere

003 CRN 23066 UTK students participating at Knoxville DE classrooms

004 CRN 23067 UTK students participating elsewhere

TEXT: http://www.utsi.edu/academics/ieandem/student_services.htm

TIME: Thursday
PROFESSOR: Dr. Denise Jackson

4:00 – 6:35

E-113

Current topics, theories, and applications for managing change and innovation for performance improvement in organizations. Multi-initiative approaches: quality management, organizational effectiveness, employee empowerment, performance measurement, and application of statistical tools and techniques. Self-assessment and Baldrige criteria for performance excellence. Change agent, team building, and leadership issues. Case studies.

(RE) Prerequisite(s): Industrial Engineering 516

EM 600 Doctoral Research and Dissertation (3-15)
SEC. 001 CRN 28199 Sedrick

ENGINEERING SCIENCE

ES 500 Thesis (1-15)
SEC. 010 CRN 26968 Antar
011 CRN 29016 Corda
020 CRN 29017 Flandro
012 CRN 26969 Majdalani
013 CRN 26970 Moeller
021 CRN 29018 Schulz
022 CRN 29019 Solies
014 CRN 26971 Steinhoff
015 CRN 26972 Vakili

ES 502 Registration for Use of Facilities (1-15)
SEC. 002 CRN 29020 Moeller

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

ES 539 Continuum Mechanics (3) (Same as AE 539/BME 539/ME 539)
SEC. 002 CRN 29441
TEXT: TBD
TIME: Monday & Wednesday 2:30 – 3:45 E-111
PROFESSOR: Dr. Trevor Moulden

Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid

mechanics.

Cross-listed: (Same as Aerospace Engineering; Biomedical Engineering 539; Mechanical Engineering 539.)

ES 542 Fluid Mechanics II (3) (Same as AE 542/ME 542)
SEC. 001 CRN 26981
TEXT: R. L. Panton; *Incompressible Flow*; 3rd Edition; John Wiley
TIME: Tuesday & Friday 9:15 – 10:30 E-211
PROFESSOR: Dr. Basil Antar

Equations of viscous fluid flows. Basic concepts and equations of turbulent flow. Separation, stability and transition. Laminar and turbulent boundary-layer flows. Exact, approximate, and numerical solutions.

Cross-listed: (Same as Aerospace Engineering 542; Mechanical Engineering 542.)

(DE) Prerequisite(s): 541.

ES 595 Engineering Science Seminar (1)
SEC. 002 CRN 26986
TEXT: None
TIME: Will be announced through email
PROFESSOR: Dr. Ahmad Vakili

All phases of aerospace engineering, reports on current research at the University of Tennessee, Knoxville, and UTSI.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum

ES 600 Doctoral Research and Dissertation (3-15)
SEC. 004 CRN 26990 Antar
010 CRN 29021 Corda
011 CRN 29022 Flandro
006 CRN 26992 Majdalani
008 CRN 26994 Moeller
007 CRN 26993 Steinhoff
012 CRN 29023 Vakili

INDUSTRIAL ENGINEERING

IE 518 Advanced Engineering Economic Analysis (3) (Video Recorded)
SEC. 001 CRN 22665 UTK Students participating at Knoxville DE Classrooms
002 CRN 22666 UTK Students participating elsewhere
003 CRN 22667 UTSI Students participating at Tullahoma or Oak Ridge
004 CRN 22668 UTSI Students participating elsewhere
TIME: Wednesday 4:00-6:35 E-113
TEXT: http://www.utsi.edu/academics/iieandem/student_services.htm
PROFESSOR: Dr. Joe Wilck

Application of engineering economic analysis in complex decision situations. Inflation and price changes; uncertainty evaluation using non-probabilistic techniques; capital financing and project allocation; evaluations involving equipment replacement, investor-owned utilities, and public works projects; probabilistic risk analysis including computer simulation and decision trees; multi-attribute decision

analysis; and other advanced topics.

(RE) Prerequisite(s): 405.

Recommended Background: Statistics 251.

IE 522 Optimization Methods in Industrial Engineering (3) (Video Recorded)

SEC. 001 CRN 22669 UTK Students participating at Knoxville DE Classrooms

002 CRN 22670 UTK Students participating elsewhere

003 CRN 22671 UTSI Students participating at Tullahoma or Oak Ridge

004 CRN 22672 UTSI Students participating elsewhere

TIME: Monday & Thursday 10:15 – 11:30 E-113

TEXT: Wayne L. Winston; *Operations Research: Applications and Algorithms*; Brooks/Cole
CENGAGE Learning; 4th Edition; ISBN 0-534-38058-1

PROFESSOR: Dr. L. Montgomery Smith

Classical optimization applied to constrained and unconstrained, non-linear, multi-variable functions; search techniques; decision making under uncertainty; game theory; and dynamic programming.

(RE) Prerequisite(s): Engineering Management 537.

Recommended Background: 301.

MATERIAL SCIENCE AND ENGINEERING

MSE 500 Thesis (1-15)

002 CRN 22467 Hofmeister

MSE 540 Basic Polymer Chemistry (3)

SEC. 001 CRN 29012

TIME: Monday & Thursday 9:15 – 10:30 F-252

TEXT: TBD

PROFESSOR: Dr. Zhongren Yue

Synthesis, reactions and degradation of polymers. Molecular characterization: solution methods and spectroscopy.

Recommended Background: Semester of organic chemistry and thermodynamics.

MSE 600 Doctoral Research and Dissertation (3, 6, 9)

SEC. 002 CRN 22487 Hofmeister

*MSE 652 High Performance Fibers (3) **CANCELLED**

SEC. 001 CRN 29013

TIME: Tuesday & Friday 9:15 – 10:30 F-252

TEXT: TBD

PROFESSOR: Dr. Zhongren Yue

Reviews the structure and properties of fibers and fiber formation methods, and discuss the principles of forming high performance fibers. Topics that will be covered include HS HM PE fibers, gel spinning , PVA fibers, HSHM fibers from cellulose, Nylon66 & PET, LC Polymers, fiber formation from LCPs, aromatic fibers, flame resistant organic fibers, carbon fibers, inorganic fibers, nanofibers, optical fibers, biodegradable fibers, absorbent fibers, etc.

(RE) Prerequisite(s): 553.

Comment(s): Prior knowledge may satisfy prerequisites, with consent of instructor.
Registration Restriction(s): Minimum student level – graduate.

MATHEMATICS

MATH 435 Partial Differential Equations (3)
SEC. 002 CRN 20572 (Video Recorded)
TEXT: Richard Haberman; Applied Partial Differential Equations with Fourier Services and Boundary Value Problems; 4th Edition; Prentice Hall; ISBN 013-065243-1
TIME: Tuesday & Friday 11:00 – 12:15 E-111
PROFESSOR: Dr. Kenneth Kimble

Separation of variables, Fourier series, solution of Laplace, wave, and heat equations.
(RE) Prerequisite(s): 231; 241 or 247.

*MATH 472 Numerical Algebra (3) (Same as CS 472) **CANCELLED**
SEC. 001 CRN 20578 (Video Recorded)
TEXT: R.L. Burden and J.P. Faires; *Numerical Analysis*; 9th Edition; Thompson Brooks/Cole; ISBN 978-0-538-73351-9
TIME: Monday & Wednesday 2:30 – 3:45 E-111
PROFESSOR: Dr. Trevor Moulden

Direct and iterative methods for systems of linear equations. Solution of single nonlinear equation and nonlinear systems. Orthogonal decomposition, least squares and algebraic eigenvalue problem.
Cross-listed: (Same as Computer Science 472.)

(RE) Prerequisite(s): 231; 200 or 251 or 257.
(DE) Prerequisite(s): 371.
Comment(s): Knowledge of a high-level programming language required.

MATH 500 Thesis (1-15)
SEC. 003 CRN 20589 Reddy

MATH 518 Mathematical Methods in Physics II (3) (Same as Phys 572)
SEC. 002 CRN 27769
TEXT: George Arfken and Hans Weber; *Mathematical Methods for Physicists*; 6th Edition; ISBN 0-12-059876-0
TIME: Monday & Thursday 2:30 – 3:45 E-113
PROFESSOR: Dr. Christian Parigger

Advanced Problems. Topics may vary according to interests of students and instructor.
Cross-listed: (Same as Phys 572.)
(DE) Prerequisite(s): 571.

MATH 547 Applied Linear Analysis (3)
SEC. 002 CRN 29944
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. K.C. Reddy

Banach and Hilbert spaces, linear operators and spectral theory, Sobolev spaces, applications.
(DE) Prerequisite(s): 545.

MECHANICAL ENGINEERING

ME 500 Thesis (1-15)
SEC. 021 CRN 22553 Antar
034 CRN 29058 Corda
022 CRN 22554 Flandro
023 CRN 22555 Majdalani
024 CRN 22556 Moeller
001 CRN 22533 Schulz
035 CRN 29059 Solies
025 CRN 22557 Steinhoff
026 CRN 22558 Vakili

ME 502 Registration for Use of Facilities (1-15)
SEC. 002 CRN 28296 Moeller

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

ME 512 Heat Transfer II (3)
SEC. 001 CRN 22569 (Video Recorded)
TEXT: Adrian Bejan; *Convection Heat Transfer*; 3rd Edition; John Wiley;
TIME: Tuesday & Friday 1:00 – 2:15 E-113
PROFESSOR: Dr. Basil Antar

Analysis of steady-state and time-dependent heat conduction by numerical methods. Analysis of laminar and turbulent convection heat transfer in internal and external flows, forced and buoyancy driven flows.

(DE) Prerequisite(s): 541.

ME 522 Thermodynamics II (3)
SEC. 001 CRN 22571 (Video Recorded)
TEXT: TBD
TIME: Tuesday & Friday 9:00 – 10:15 E-111
PROFESSOR: Dr. George Murray

Macroscopic thermodynamics, including First and Second Law analyses, availability, phase and chemical equilibrium criteria, combustion, gas mixtures, and property relations, determination of thermodynamic properties from molecular structure, spectroscopic data, kinetic theory, statistical mechanics, quantum physics, Schroedinger equation.

Recommended Background: Undergraduate thermodynamics.

ME 539 Continuum Mechanics (3) (Same as AE 539/BME 539/ES 539)

SEC. 002 CRN 29036

TEXT: TBD

TIME: Monday & Wednesday 2:30 – 3:45 E-111

PROFESSOR: Dr. Trevor Moulden

Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics.

Cross-listed: (Same as Aerospace Engineering 539; Biomedical Engineering 539; Engineering Science 539.)

ME 540 Perturbation Methods in Engineering (3)

SEC. 001 CRN 29539 (Video Recorded)

TEXT: Class Notes

TIME: Monday & Wednesday 5:30 – 6:35 E-111

PROFESSOR: Dr. Joseph Majdalani

Solution of nonlinear problems in solid and fluid mechanics and dynamics by use of asymptotic perturbation techniques. Asymptotic expansions, regular and singular perturbations and applications in dynamics, celestial mechanics, potential, viscous and compressible flows. Uniformly valid approximations in various physical problems. Generalized boundary-layer techniques. Coordinate straining techniques; Poincaré's method. Matched asymptotic expansions and multiple scales. Problems with several time or length scales. Examples taken from various fields of science.

Registration Permission: Consent of instructor.

ME 542 Fluid Mechanics II (3) (Same as AE 542/ ES 542)

SEC. 001 CRN 22577

TEXT: Ronald L. Panton; *Incompressible Flow*; 3rd Edition; John Wiley;

TIME: Tuesday & Friday 9:15 – 10:30 E-211

PROFESSOR: Dr. Basil Antar

Equations of viscous fluid flows. Basic concepts and equations of turbulent flow. Separation, stability and transition. Laminar and turbulent boundary-layer flows. Exact, approximate, and numerical solutions.

Cross-listed: (Same as Aerospace Engineering 542; Engineering Science 542.)

(DE) Prerequisite(s): 541.

ME 582 Rocket Propulsion II (3)

SEC. 001 CRN 29038

TEXT: George P. Sutton; *Rocket Propulsion Elements*; 8th Edition; Wiley, New York 2001; ISBN 0471326429

TIME: Tuesday & Friday 1:00 – 2:15 F-252

PROFESSOR: Dr. Trevor Moeller

Solid propellant rocket performance, homogeneous and heterogeneous propellant chemistry and combustion system performance, thermal decomposition and gas phase reaction models; effect of chamber pressure and additives on solid propellant burn rates, erosive burning; analysis of two-phase solid rocket exhaust flow. Introduction to nuclear and electric propulsion; electrical resistance and electric field (ion) engine performance, magnetohydrodynamic thrusters, traveling wave thrusters; exotic propulsion systems.

Registration Permission: Consent of instructor.

ME 585 Turbomachinery II (3)

SEC. 001 CRN 22579 (Video Recorded)
TEXT: Jack D. Mattingly; *Elements of Propulsion: Gas Turbines and Rockets*; 2006;
ISBN 1-56347-779-3
TIME: Tuesday & Thursday 4:00 – 5:15 E-111
PROFESSOR: Dr. Milt Davis

Ideal cycle analysis of turbine engines, real cycle analysis, component performance analysis, component design and systems integration (inlets, nozzles, combustors, compressors, turbines), flowthrough theory, turbine engine component matching, transient operation, surge and rotating stall, engine control systems, structural considerations.

Comment(s): First-year graduate standing required.

Registration Permission: Consent of instructor.

ME 590 Selected Engineering Problems (3)
SEC. 003 CRN 29039 Antar
005 CRN 29040 Corda
006 CRN 29041 Flandro
007 CRN 29042 Majdalani
008 CRN 29043 Moeller
009 CRN 29044 Schulz
002 CRN 22581 Smith
010 CRN 29045 Solies
011 CRN 29046 Steinhoff
012 CRN 29047 Vakili

Repeatability: May be repeated. Maximum 6 hours.

Comment(s): Enrollment limited to students in problems option.

Registration Permission: Consent of advisor.

ME 595 Mechanical Engineering Seminar (1)
SEC. 001 CRN 22582
TEXT: None
TIME: Will be announced through email
PROFESSOR: Dr. Ahmad Vakili

*ME 599 Special Topics in Mechanical Engineering: Hybrid Rocket Propulsion (3) (AE 599) **CANCELLED**
SEC. 006 CRN 29538
TEXT: Class Notes
TIME: Monday & Thursday 1:00 – 2:15 B-112
PROFESSOR: Dr. Joseph Majdalani

This course reviews the fundamentals of hybrid rocket propulsion with special emphasis on application-based design and system integration, propellant selection, flow and regression rate modeling, solid fuel pyrolysis, scaling effects, transient behavior, and combustion instability. Advantages and disadvantages of both conventional and swirl-driven vortex hybrid configurations are examined. Course includes testing of laboratory-scale hybrid rockets.

Prereq: ME 581 or consent of instructor.

ME 600 Doctoral Research and Dissertation (3-15)
SEC. 015 CRN 22603 Antar
029 CRN 29048 Corda

030 CRN 29049 Flandro
 016 CRN 22604 Majdalani
 019 CRN 22607 Moeller
 018 CRN 22606 Steinhoff
 027 CRN 22615 Vakili
 ME 661 Advanced Vibrations (3)
 SEC. 001 CRN 29859
 TEXT: P.G. Drazin: Nonlinear Systems
 TIME: Monday & Thursday 10:45 – 12:00 E-210
 PROF: Dr. Gary Flandro

Application of modern analytical and computational tools (phase space analysis, perturbation methods, bifurcation theory, chaos, etc.) in the analysis of nonlinear vibrations. Emphasis on coupled oscillators, continuous systems, limit cycle behavior, self-excited and nonlinear forced systems.

(DE) Prerequisite(s): 534.

Registration Restriction(s): Minimum student level – graduate.

PHYSICS

PHYS 500 Thesis (1-15)
 SEC. 006 CRN 25149 Chen
 002 CRN 25145 Crater
 004 CRN 25147 Davis
 003 CRN 25146 Lewis
 005 CRN 25148 Parigger

PHYS 503 Physics Colloquium (1)
 SEC. 002 CRN 25154
 TEXT: None
 TIME: Each 2nd Thursday 3:30 – 5:00 H-111
 PROFESSOR: Dr. Christian Parigger

Lectures and discussion on current research topics. Continuous registration required for current graduate students.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 6 hours.

PHYS 512 Theoretical Physics II (3)
 SEC. 002 CRN 25155 (Video Recorded)
 TEXT: Constant; *Theoretical Physics*; Addison Wesley
 TIME: Monday & Thursday 10:00 – 11:15 E-111
 PROFESSOR: Dr. Horace Crater

Concepts and applications in applied physics. Topics: electrostatic and magneto-static problems, EM waves, duality and quantization, absorption and emission, statistical ensemble and thermal equilibrium, and other modern applications of current interest, in areas of quantum chemistry, biophysics, optics,

spectroscopy, and astrophysics.

Recommended Background: Familiarity with computational methods.

PHYS 522 Quantum Mechanics (3)

SEC. 002 CRN 29050

TEXT: http://www.amazon.com/Modern-Quantum-Mechanics-2nd-Sakurai/dp/0805382917/ref=cm_cr_pr_product_top#

TIME: Tuesday & Friday

10:45 – 12:00

E-211

PROFESSOR: Dr. Lloyd Davis

Fundamental principles of quantum mechanics, angular momentum, electron spin, particles in electric and magnetic fields, perturbation theory, variational methods, scattering theory; second quantization, quantization of electromagnetic field, emission, absorption, and scattering of light, bremsstrahlung, pair creation and annihilation. Application of quantum mechanics to problems of atomic, molecular, nuclear, and solid state physics.

(DE) Prerequisite(s): 521.

PHYS 541 Electromagnetic Theory (3)

SEC. 002 CRN 27424

TEXT: Jackson; *Classical Electrodynamics*; 2nd Edition

TIME: Monday & Thursday

10:45 – 12:00

B-210

PROFESSOR: Dr. Horace Crater

Review of electrostatics, magnetostatics, and quasi-static problems; Maxwell's field equations and their solutions in dielectric and conducting media; electrodynamics and relativity, retarded potentials and gauge transformations, radiation produced by accelerating charges.

(DE) Prerequisite(s): 571.

*PHYS 551 Statistical Mechanics (3) **CANCELLED**

SEC. 001 CRN 29052 (Video Recorded)

TEXT: TBD

TIME: Tuesday & Thursday

8:30 – 9:45

E-113

PROFESSOR: Dr. Lloyd Davis

Ergodic theory, classical ensemble theory, quantum mechanical ensembles, relation of statistical mechanics to thermodynamics, transport theory and approach to equilibrium, phase transition, fluctuations and correlations.

(RE) Prerequisite(s): 521, 531, and 571.

PHYS 572 Mathematical Methods in Physics II (3) (Same as Math 518)

SEC. 002 CRN 27757

TEXT: George Arfken and Hans Weber; *Mathematical Methods for Physicists*; 6th Edition; ISBN 0-12-059876-0

TIME: Monday & Thursday

2:30 – 3:45

E-113

PROFESSOR: Dr. Christian Parigger

Advanced Problems. Topics may vary according to interests of students and instructor.

Cross-listed: (Same as Mathematics 518.)

(DE) Prerequisite(s): 571.

PHYS 573 Numerical Methods in Physics (3)

SEC. 002 CRN 25162

TEXT: Survey of Computational Physics; Rubin Landau et al.; Princeton; Numerical Recipes, The Art of Scientific Computing; THIRD EDITION; W. H. Press et al., ISBN 978-0521-88068-8; and selected other references and example codes, e.g., Schmid et al, Theoretical Physics on the Personal Computer, Springer, 1990, including references to computer languages such as FORTRAN, C, C++, Java, and/or implementations of software packages / libraries. Focus of 573 will be the former sections of the Landau et al book (<http://press.princeton.edu/titles/8704.html>) and the Num. Recipes book. The book *George Arfken and Hans Weber; Mathematical Methods for Physicists; 6th Edition; ISBN 0-12-059876-0*, will also be used to address numerical aspects of *Mathematical Methods*

TIME: Tuesday & Friday

2:30 – 3:45

E-211

PROFESSOR: Dr. Christian Parigger

Numerical methods for solution of physical problems, use of digital computers, analysis of errors.

(DE) Prerequisite(s): 571 or consent of instructor.

PHYS 593 Independent Study - Modern Physics: General Relativity (1)

SEC. 002 CRN 29858

TEXT: TBD

TIME: TBD

PROF: Dr. Horace Crater

This course will explore an approach to Einstein's general relativity developed by the physicist Mendel Sachs.

Repeatability: May be repeated. Maximum 15 hours.

PHYS 599 Physics Seminar (1)

SEC. 007 CRN 25173

TEXT: None

TIME: Each 2nd Thursday

3:30 – 5:00

H-111

PROFESSOR: Dr. Christian Parigger

(a) Mechanics; (b) Radiation; (c) Heat and Thermodynamics; (d) Electricity and Magnetism; (e) Modern Physics.

Repeatability: May be repeated with consent of department. Maximum 18 hours.

PHYS 600 Doctoral Research and Dissertation (3-15)

SEC. 006 CRN 25180 Chen

002 CRN 25176 Crater

004 CRN 25178 Davis

003 CRN 25177 Lewis

005 CRN 25179 Parigger

PHYS 605 Laser Spectroscopy (3)

SEC. 001 CRN 29055

TEXT: Classic books, on-line references, lecture and lab notes: (1) several textbooks will be used to review classical laser spectroscopy: "Laser Spectroscopy," Demtröder; "Atomic and Laser Spectroscopy," Corney; "Introduction to Nonlinear Laser Spectroscopy," Levenson; "Aux Frontieres de la Spectroscopie Laser," Les Houches, Vol. 1, 2 ed. Balian, Haroche, Liberman; "Laser Spectroscopy," ed. Brewer, Mooradian, "Physics Reports: High resolution spectroscopy with lasers," Demtröder; (2) current topics by

use of on-line journals, including “Applied spectroscopy,” “Journal of quantitative spectroscopy & radiative transfer,” “Optics and spectroscopy,” “Spectrochimica Acta Part A: Molecular Spectroscopy,” “Spectrochimica acta. Part A (Molecular and biomolecular spectroscopy) and B (Atomic spectroscopy);” “Journal of Physics B, Atomic, molecular and optical physics,” “Review of Modern Physics,” e.g. “Laser Spectroscopy and Quantum Optics,” Hänsch and Walther, OSA publications, and PROLA (Physical Review Online Archive) <http://prola.aps.org> ; (3) selected lecture notes and laboratory notes.

TIME: Monday & Thursday 1:00 – 2:15 E-113

PROFESSOR: Dr. Christian Parigger

Applications of lasers to spectroscopy of atomic and molecular systems; absorption, laser-induced fluorescence, and Raman spectroscopy; molecular and atomic coherence, quantum beats, resonance fluorescence, photon echoes, self-induced transparency; saturation and Doppler-free spectroscopy; laser cooling and trapping.

(DE) Prerequisite(s): 521 and 541.

Registration Restriction(s): Minimum student level – graduate.

*PHYS 606 Nonlinear Optics (3) **CANCELLED**

SEC. 001 CRN 29659 (Videotaped)

TEXT: Boyd; *Nonlinear Optics*; 3rd Edition;

<http://www.amazon.com/Nonlinear-Optics-Third-Robert-Boyd/dp/0123694701>

TIME: Tuesday & Thursday 8:30 –9:45 E-113

PROFESSOR: Dr. Lloyd Davis

Nonlinear optical susceptibilities, wave propagation in nonlinear media, sum-frequency and difference frequency generation, harmonic generation, parametric amplification and oscillation, stimulated Raman processes, two- and multi-photon processes, four-wave mixing and phase conjugation, transient coherent optical effects and free induction decay, optical breakdown and nonlinear effects in plasmas.

(DE) Prerequisite(s): 522.

Registration Restriction(s): Minimum student level – graduate.

PHYS 611 Advanced Quantum Mechanics and Field Theory (3)

SEC. 002 CRN 27756

TEXT: Sakurai; *Advanced Quantum Mechanics*

TIME: Monday & Thursday 1:00 – 2:15 E-111

PROFESSOR: Dr. Horace Crater

Survey of problems and methods. Topics of current interest.

Survey of problems and methods in advanced quantum mechanics, including second quantization, the Dirac equation, and quantum electrodynamics as well as topics of current interest.

Comment(s): Intended for all graduate students.

Registration Restriction(s): Minimum student level – graduate.