

Summer 2011

Registration Announcement



*“The **FUTURE** Is Bright at”*
The University of Tennessee
Space Institute

411 B.H. Goethert Parkway
Tullahoma, TN 37388-9700
888-822-8874 x-37228

www.utsi.edu

See Inside for Online Registration Instructions

<https://my.utk.edu>

Summer 2011

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Publication: E02-4001-003-11

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**CALENDAR
SUMMER SEMESTER 2011**

| | |
|---|------------------------------|
| Registration..... | March 2, 2011 – June 1, 2011 |
| Submit Admission to Candidacy Forms Summer 2011 Graduation..... | April 29, 2011 |
| Submit Graduation Application | April 29, 2011 |
| Late Registration and late fees begin | June 2 – June 10, 2011 |
| Memorial Day (Holiday)..... | May 30, 2011 |
| Classes begin..... | June 2, 2011 |
| Last Day to Final Register, Add, Change Grading Options or Drop without a “W” | June 10, 2011 |
| Pay Graduation Fee..... | June 24, 2011 |
| Preliminary Thesis/Dissertation Review Deadline | June 24, 2011 |
| Independence Day Holiday..... | July 4, 2011 |
| Last day to schedule final exam (thesis) | July 8, 2011 |
| Last day to schedule final exam (non-thesis/capstone students)..... | July 8, 2011 |
| Last day to schedule final exam (dissertation)..... | July 15, 2011 |
| Last day to defend thesis..... | July 22, 2011 |
| Last day to take final exam (non-thesis/capstone students)..... | July 22, 2011 |
| Last day to defend dissertation | July 22, 2011 |
| Last Day to Drop with a “W” | July 11, 2011 |
| Final paper or electronic thesis/dissertation must be approved and accepted in Knoxville By (5:00 P.M. EST) | August 5, 2011 |
| Submit Pass/Fail form to UTSI Registrar’s Office | August 5, 2011 |
| Deadline for submission of Admission to Candidacy for students graduating Fall 2011 | August 5, 2011 |
| Deadline for removing "INCOMPLETE" grades | August 9, 2011 |
| Classes End..... | August 9, 2011 |
| Withdraw from all classes..... | August 9, 2011 |
| Exam Period (Exams are given during the regularly scheduled class meeting times.) Second thesis/dissertation deadline (Student will receive diploma December 2011 but do not have to register for Fall 2011) (Defense completed by August 9)..... | August 16, 2011 |
| No Graduate Hooding or Summer Commencement – Graduation Date..... | August 17, 2011 |

FALL SEMESTER 2011

| | |
|--|--------------------------|
| Priority Registration for Fall Semester 2011 on CPO..... | March 21, 2011 |
| Late Registration..... | TBD |
| Classes begin..... | August 17, 2011 |
| Labor Day (Holiday)..... | September 5, 2011 |
| Fall Break..... | September 29-30, 2011 |
| Thanksgiving Break | November 24-25, 2011 |
| Classes End | November 29, 2011 |
| Study Period..... | November 30, 2011 |
| Exam Period..... | December 1, 2, 5-8, 2011 |
| Doctoral Hooding Ceremony (UTK) | December 8, 2011 |
| Commencement (UTK) | December 9, 2011 |

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

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

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

SUMMER SEMESTER 2011

FINAL STUDY DAY AND EXAM SCHEDULE

LAST DAY OF CLASSES.....August 9, 2011

FINAL EXAMS FOR SUMMER ARE GIVEN DURING THE REGULARLY SCHEDULED CLASS MEETING TIMES LISTED BELOW:

Monday, Thursday and Tuesday, Friday

7:45 – 9:45
10:00 – 12:00
1:00 – 3:00
3:15 – 5:15

****** ATTENTION ******

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

REGISTRATION ANNOUNCEMENT SUMMER SEMESTER 2011

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://gradstudies.utk.edu/>.

REGISTRATION

Students will register at <http://my.utk.edu>. You will need to log in using your NetID and your NetID password. The following instructions were provided by UTK:

*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, replacing "your NetID" with your actual NetID, 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.) at MyUTK.

*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 Summer Term 2011

| | |
|---|----------------------------------|
| Statement information available on MyUTK.UTK | May 9, 2011 |
| Priority Registration Payment/Confirmation Deadline | June 1, 2011 at 4:30 p.m. (EST) |
| Late Registration/Late Fees Begin | June 2, 2011 |
| Late Registration Payment/Confirmation Deadline | June 10, 2011 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.

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 Business Office.

SPECIAL BILLING – THIRD PARTY BILLING:

The Business 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 Business 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 |
| Business Office: | 1-888-822-UTSI (8874)-37204 |
| 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 \$35.00 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 June 2, 2011. The only credit/debit cards The University of Tennessee Space Institute accepts are Visa, MasterCard and Discover.

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 | \$3,720.00* |
| Programs and Services Fee | 75.00 |
| Total | \$3,795.00 |

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

| | |
|---------------------------------|-------------|
| Maintenance Fee | \$3,720.00* |
| Programs and Services Fee | 75.00 |
| Tuition | \$7,519.00* |
| Total | \$11,314.00 |

*** BEGINNING FALL 2010 an additional \$45.00 per credit hour with no cap will be charged to ALL ENGINEERING COURSES.**

***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 | \$414.00 per semester hour |
| 3 hours | \$1,242.00 |
| OUT-OF-STATE | \$1,250.00 per semester hour |
| 3 hours | \$3,750.00 |

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 eight semester hours or more for Summer Semester are assessed an activity fee of \$75.00 per semester. Part-time students taking fewer than eight 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 deferred payment must be paid by the 45th day of the semester. 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 |
|-----------------------|---------------|---------------|
| June 2 - 6 | NO CHARGE | 100% |
| June 7 - 12 | 20% CHARGE | 80% |
| June 13 - 17 | 40% CHARGE | 60% |
| June 18 - 22 | 60% CHARGE | 40% |
| June 23 - 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 Summer Semester 2011 must remove all INCOMPLETE GRADES by **August 9, 2011**. 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 2010-2011 academic year is provided by Aetna. The premium must be paid before registration. Contact the Human Resources Office (C-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.

FINAL EXAM DATES FOR SUMMER SEMESTER 2011

Final exams are given during the regularly scheduled class meeting times.

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.

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

**The University of Tennessee Space Institute
Summer 2011 Course Listings**

AEROSPACE ENGINEERING

*AE 422 Aerodynamics (3) **CANCELLED**
SEC. 001 CRN 32762 (Video Recorded)
TEXT: John D. Anderson, Jr.; *Fundamentals of Aerodynamics*; 2nd or later Edition; McGraw Hill
ISBN 0-07-001679-8
TIME: Tuesday & Thursday 1:00 – 3:30 E-111
PROFESSOR: Dr. Peter Solies

Theory and design of aerodynamic bodies for desired characteristics. Potential flow theory, viscous effects, and compressibility effects. Subsonic, transonic, and supersonic airfoils.
(RE) Prerequisite(s): 351 and 370.

AE 500 Master's Thesis (3, 6, 9)
SEC. 002 CRN 32766 Antar
003 CRN 32767 Corda
004 CRN 32768 Flandro
005 CRN 32769 Majdalani
010 CRN 32774 Moeller
011 CRN 32775 Schulz
013 CRN 32777 Solies
014 CRN 32779 Steinhoff
015 CRN 32780 Vakili

AE 502 Registration for Use of Facilities (1-15)
SEC. 001 CRN 32783 Moeller

*AE 513 Experimental Methods in Fluid Mechanics (3) **CANCELLED**
SEC. 001 CRN 32784
TEXT: J.R. Goldstein; *Fluid Mechanics Measurements*; 2nd Edition; Taylor and Francis
ISBN 1-56032-306-X
TIME: Monday & Thursday 10:00 – 12:00 E-210
PROFESSOR: Dr. Ahmad Vakili

Experimental techniques with laboratory experiments; representative experiments: hot wire anemometry and turbulence measurements, flow visualization, wind tunnel tests, water table experiments, supersonic flow experiments, boundary layer measurements, laser-optical measurements.
(DE) Prerequisite(s): 541.

AE 522 Aerodynamics of Compressible Fluids (3)
SEC. 001 CRN 33196

TEXT: John D. Anderson; *Modern Compressible Flow: With Historical Perspectives*; 3rd Edition; McGraw-Hill; ISBN 0-07-242443-5

TIME: Monday & Thursday 1:00 – 3:00 F-252

PROFESSOR: Dr. Trevor Moeller and Dr. Ahmad Vakili

One-dimensional internal and external flow; waves; small perturbation theory; slender body theory; similarity rules; method of characteristics.

(DE) Prerequisite(s): 521.

AE 532 Introduction to Turbulence (3)

SEC. 001 CRN 32785 (Video Recorded)

TEXT: Tennekes Lumley; *A First Course in Turbulence*; Latest Edition; MIT Press
ISBN 0-262-200198

TIME: Tuesday & Friday 9:15 – 11:00 E-111

PROFESSOR: Dr. Basil Antar

Macroscopic effects, analogies, statistical treatment, correlation functions, energy spectra, diffusion; application of turbulent jets and pipe flow.

(DE) Prerequisite(s): 511 and 512.

AE 590 Selected Engineering Problems (3)

SEC. 001 CRN 32786 Antar

002 CRN 32787 Corda

003 CRN 32788 Flandro

004 CRN 33197 Majdalani

005 CRN 33198 Moeller

006 CRN 33199 Schulz

007 CRN 33200 Solies

008 CRN 33201 Steinhoff

009 CRN 33202 Vakili

Repeatability: May be repeated. Maximum 6 hours.

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

Registration Permission: Consent of advisor.

AE 600 Doctoral Research/Dissertation (3-15)

SEC. 002 CRN 32791 Antar

003 CRN 32792 Corda

004 CRN 32793 Flandro

005 CRN 32794 Majdalani

011 CRN 32800 Moeller

012 CRN 32801 Steinhoff

AE 690 Advanced Topics in Aerospace Engineering: Vorticity Confinement (3)
SEC. 001 CRN 32802
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. John Steinhoff

Repeatability: May be repeated. Maximum 9 hours.
Registration Restriction(s): Minimum student level – graduate.
Registration Permission: Consent of instructor.

AVIATION SYSTEMS

AS 500 Master's Thesis (3, 6, 9)
SEC. 001 CRN 32395 Corda
002 CRN 32396 Martos
003 CRN 32397 Muratore
004 CRN 32398 Pujol
005 CRN 32399 Solies

AS 502 Registration for Use of Facilities (1-15)
SEC. 001 CRN 32420 Corda
002 CRN 32421 Martos
003 CRN 32422 Muratore
004 CRN 32423 Pujol
005 CRN 32424 Solies

AS 507 Introduction to Airborne Radar (3)
SEC. 001 CRN 32426 (Video Recorded)
TEXT: George W. Stimson; *Introduction to Airborne Radar*; Latest Edition; Scitech Publishing, Inc.; ISBN 1-89-1121-01-4
TIME: Tuesday & Friday 10:15 – 12:00 E-113
PROFESSOR: Dr. Alfonso Pujol, Jr.

Theory and application of airborne radar. Radar detection and measurement techniques through aviation systems applications. Ground effects on radar signals of multipath and clutter. Pulsed operation, coding, filters, processing techniques, Doppler effects. Problems of range and range rate and tracking. Methods and techniques for reducing radar cross section.

*AS 510 Special Topics in Aviation Systems: Aerospace Vehicle Modeling and Simulation (3) **CANCELLED**
SEC. 001 CRN 32427 (Video Recorded)
TEXT: David Allerton; *Principles of Flight Simulation*; 1st Edition; AIAA; ISBN 978-1-60086-703-3
TIME: Tuesday & Friday 1:00 – 3:00 E-113
PROFESSOR: Borja Martos

This course will derive the equations of motion of a 6 DOF aerospace vehicle. Numerical integration methods in MATLAB[®] / SIMULINK[®] will be used to solve these equations. Physical understanding of the equations of motion and stability derivatives will be discussed at length. An aerospace vehicle will be

modeled from simple components up to more complex systems. These 6 DOF simulations will be applied toward pilot in the loop simulations, fly by wire flight controls, and flight test engineering problems. Students will walk away with a pilot in the loop simulation that integrates a joystick and is connected to FlightGear® flight simulator on their personal computer. A joystick is required.

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: Flight Test Data Processing (3) **CANCELLED**
 SEC. 002 CRN 33338 (Video Recorded)
 TEXT: Class Notes
 TIME: Monday & Thursday 10:15 – 12:30 E-113
 PROFESSOR: John Muratore

This course will introduce the student to the typical data processing techniques and issues unique to a flight test. The course will discuss the unique nature of flight test data sources (telemetry, recordings, military and commercial databus formats, audio and video formats) and unique processing algorithms to deal with these formats. The course will discuss data compression and processing algorithms typically used in real time as well as postflight data reduction. The course will discuss techniques for reducing noise in flight test data such as digital filtering and wildpoint elimination, techniques for performing statistical analysis of flight data such as regression analysis and techniques for analyzing flight test data in the time and frequency domain (fourier and spectral analysis). The course will discuss the problems associated with planning for flight test data reduction including problems in managing databases and building data simulators for flight test data processing operations and validation. Special topics such as data archiving and flight visualization will also be discussed. The course will make extensive use of LabVIEW and the students will be expected to program and test algorithms in these languages. Excel will also be used.

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 550 Project in Aviation Systems (3)
 SEC. 001 CRN 32428 Corda
 002 CRN 32429 Martos
 003 CRN 32431 Muratore
 004 CRN 32432 Pujol
 005 CRN 32434 Solies

BIOMEDICAL ENGINEERING

BME 529 Applications of Linear Algebra in Engineering Systems (3)
 SEC. 001 CRN 32821
 TEXT: Sohail A. Dianat and Eli S. Saber; *Advanced Linear Algebra for Engineers with MATLAB*;
 Latest Edition; CRC Press; ISBN 978-1-4200-9523-4
 TIME: Pre-Recorded Video Lectures, Exam Periods TBA
 PROFESSOR: Dr. L. Montgomery Smith

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and

SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Biomedical Engineering 529; Electrical and Computer Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529.)

Comment(s): Graduate standing or consent of instructor required.

CHEMICAL AND BIOMOLECULAR ENGINEERING

CBE 529 Applications of Linear Algebra in Engineering Systems (3)

SEC. 001 CRN 32849

TEXT: Sohail A. Dianat and Eli S. Saber; *Advanced Linear Algebra for Engineers with MATLAB*; Latest Edition; CRC Press; ISBN 978-1-4200-9523-4

TIME: Pre-Recorded Video Lectures, Exam Periods TBA

PROFESSOR: Dr. L. Montgomery Smith

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Biomedical Engineering 529; Electrical and Computer Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529.)

Comment(s): Graduate standing or consent of instructor required.

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

ECE 500 Master's Thesis (3, 6, 9)

SEC. 001 CRN 32967 Bomar

026 CRN 32992 Pujol

027 CRN 32993 Smith

028 CRN 32994 Whitehead

ECE 501 Project in Lieu of Thesis (3)

SEC. 001 CRN 33033 Bomar

006 CRN 33038 Pujol

007 CRN 33039 Smith

008 CRN 33040 Whitehead

ECE 529 Application of Linear Algebra in Engineering Systems (3)

SEC. 001 CRN 33085

TEXT: Sohail A. Dianat and Eli S. Saber; *Advanced Linear Algebra for Engineers with MATLAB*; Latest Edition; CRC Press; ISBN 978-1-4200-9523-4

TIME: Pre-Recorded Video Lectures, Exam Periods TBA

PROFESSOR: Dr. L. Montgomery Smith

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Biomedical Engineering 529; Electrical and Computer Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529.)

Comment(s): Graduate standing or consent of instructor required.

ECE 600 Doctoral Research/Dissertation (3, 6, 9)
 SEC. 028 CRN 33120 Bomar

ENGINEERING MANAGEMENT

EM 536 Project Management (3)
 SEC. 001 CRN 30008 UTSI students participating at Tullahoma or Oak Ridge
 002 CRN 30009 UTSI students participating elsewhere
 003 CRN 30010 UTK students participating at Knoxville DE classrooms
 004 CRN 30011 UTK students participating elsewhere

TEXT: Harold Kerzner; *Project Management: A System Approach to Planning, Scheduling and Controlling*; 9th Edition; John Wiley; ISBN 978-0-471-74187-9

TIME: Monday & Wednesday 4:00 – 6:35 E-113

PROFESSOR: Dr. Albert Garcia

Development and management of engineering and technology projects. Project proposal preparation; resource and cost estimating; and project planning, organizing, and controlling: network diagrams and other techniques. Role of project manager: team building, conflict resolution, and contract negotiations. Discussion of typical problems and alternative solutions. Case studies and student projects.

(RE) Prerequisite(s): 537 or consent of instructor.

EM 538 New Venture Formation (3)
 SEC. 001 CRN 33325 UTSI students participating at Tullahoma or Oak Ridge
 002 CRN 33528 UTSI students participating elsewhere
 003 CRN 33529 UTK students participating at Knoxville DE classrooms
 004 CRN 33530 UTK students participating elsewhere

TEXT: TBA

TIME: Tuesday & Thursday 4:00 – 6:35 E-113

PROFESSOR: Dr. Gregory Sedrick

Factors other than mechanical or chemical which enter into successful establishment of manufacturing or service enterprise. Organizational and financial planning and evaluation. Cost and location studies and market analysis to determine commercial feasibility of new ventures.

(RE) Prerequisite(s): 539.

*EM 542 Design of Experiments for Engineering Managers (3) **ALL SECTIONS CANCELLED**
 SEC. *001 CRN 30012 UTSI students participating at Tullahoma or Oak Ridge **CANCELLED**
 *002 CRN 30013 UTSI students participating elsewhere **CANCELLED**
 *003 CRN 30014 UTK students participating at Knoxville DE classrooms **CANCELLED**

*004 CRN 30015 UTK students participating elsewhere **CANCELLED**

TEXT: Professor will provide electronic files for textbook; Principles of Experimental Design and Analysis

TIME: Monday & Wednesday 4:00 – 6:35 E-113

PROFESSOR: Dr. Albert Garcia

Methodology for experiments in product, service, and process improvements. Factorial experiments, screening designs, variance reduction, and other selected topics for engineering managers. Taguchi philosophy and concepts. Optimization and response surface methods. Case studies.

(RE) Prerequisite(s): *Industrial Engineering 516.*

EM 600 Doctoral Research/Dissertation (3-15)

SEC. 002 CRN 33723 Sedrick

ENGINEERING SCIENCE

ES 500 Master's Thesis (3, 6, 9)

SEC. 001 CRN 30021 Antar
003 CRN 30023 Corda
004 CRN 30024 Flandro
005 CRN 30025 Majdalani
006 CRN 30026 Moeller
014 CRN 30034 Schulz
016 CRN 33329 Solies
017 CRN 33330 Steinhoff
018 CRN 33331 Vakili

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

SEC. 002 CRN 30037 Moeller

ES 600 Doctoral Research/Dissertation (3, 6, 9)

SEC. 002 CRN 30039 Antar
003 CRN 30040 Corda
004 CRN 30041 Flandro
009 CRN 30046 Majdalani
012 CRN 30049 Moeller
013 CRN 33332 Steinhoff

INDUSTRIAL ENGINEERING

IE 529 Applications of Linear Algebra in Engineering Systems (3)

SEC. 001 CRN 30307

TEXT: Sohail A. Dianat and Eli S. Saber; Advanced Linear Algebra for Engineers with MATLAB; Latest Edition; CRC Press; ISBN 978-1-4200-9523-4

SEC. 002 CRN 30376 Hofmeister
003 CRN 33531 Johnson, J.

MSE 529 Applications of Linear Algebra in Engineering Systems (3)

SEC. 001 CRN 30370

TEXT: Sohail A. Dianat and Eli S. Saber; *Advanced Linear Algebra for Engineers with MATLAB*;
Latest Edition; CRC Press; ISBN 978-1-4200-9523-4

TIME: Pre-Recorded Video Lectures, Exam Periods TBA

PROFESSOR: Dr. L. Montgomery Smith

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Biomedical Engineering 529; Electrical and Computer Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529.)

Comment(s): Graduate standing or consent of instructor required.

MATHEMATICS

MATH 443 Complex Variables (3)

SEC. 001 CRN 31853

TEXT: M. Spiegel; *Complex Variables Schaum's Outline*; 29th Edition; McGraw Hill;
ISBN 07-060230-1

TIME: Monday & Thursday 1:00 – 3:00 E-113

PROFESSOR: Dr. Horace Crater

Introduction to the theory of functions of a complex variable, including residue theory and contour integrals.

Theory of functions of complex variable (arithmetic, algebra, and trigonometry); complex differentiation and analytic functions with applications to solutions of Laplace equations; complex integration, residue theory and contour integrals with applications to Fourier and Laplace transforms, Fourier Series, and the summation of infinite series; conformal mapping and applications to solving boundary value problems in physics and engineering including applications to fluid and heat flows and electrostatics.

(RE) Prerequisite(s): 241 or 247.

MATH 500 Master's Thesis (3, 6, 9)

SEC. 001 CRN 31856 Reddy

MATH 578 Numerical Methods for Partial Differential Equations (3)

SEC. 001 CRN 33333

TEXT: Alfio Quarteroni et al., *Numerical Mathematics*, 2nd edition, ISBN 0939-2475; lecture notes; Rubin Landau; *Survey of Computational Physics*; Princeton, (hardcopy 2008, updated online 2011); *Numerical Recipes*; 3rd Edition; ISBN 978-3-540-34658-6; Zwillinger's Handbook on Differential Equations, 3rd Edition, Academic Press (1997); ISBN 0-12-784396-5. Other references and example codes, including online references to parallel programming using

MPICH2, computer languages such as FORTRAN, C, C++, JAVA, Python and/or implementations of software packages/libraries.

TIME: Monday & Wednesday 1:00 – 3:00 E-111
PROFESSOR: Dr. Christian Parigger

Numerical approximation of solutions of partial differential equations including conservation laws and hyperbolic, parabolic, and elliptic problems. Derivation, physical meaning, and implementation of schemes. *Recommended Background: A course in partial differential equations or 512 or 515, and familiarity with an operating system and a programming language.*

MECHANICAL ENGINEERING

ME 500 Master's Thesis (3, 6, 9)
SEC. 002 CRN 30406 Antar
003 CRN 30407 Corda
004 CRN 30408 Flandro
023 CRN 30438 Majdalani
024 CRN 30439 Moeller
028 CRN 30443 Schulz
029 CRN 33334 Solies
030 CRN 33335 Steinhoff
031 CRN 33336 Vakili

ME 502 Registration for Use of Facilities (1-15)
SEC. 002 CRN 30445 Moeller

ME 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 001 CRN 30448

TEXT: Sohail A. Dianat and Eli S. Saber; *Advanced Linear Algebra for Engineers with MATLAB*; Latest Edition; CRC Press; ISBN 978-1-4200-9523-4

TIME: Pre-Recorded Video Lectures, Exam Periods TBA

PROFESSOR: Dr. L. Montgomery Smith

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Biomedical Engineering 529; Electrical and Computer Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529.)

Comment(s): Graduate standing or consent of instructor required.

ME 590 Selected Engineering Problems (3)
SEC. 001 CRN 30470 Antar
002 CRN 30472 Corda
003 CRN 30474 Flandro
004 CRN 33649 Majdalani
005 CRN 33650 Moeller

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| 006 | CRN 33651 | Schulz |
| 007 | CRN 33652 | Solies |
| 008 | CRN 33653 | Steinhoff |
| 009 | CRN 33654 | Vakili |

Repeatability: May be repeated. Maximum 6 hours.

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

Registration Permission: Consent of advisor.

*ME 599 Special Topics in Mechanical Engr: Vapor-Liquid Two-Phase Thermohydraulics (3) **CANCELLED**
 SEC. 003 CRN 30484
 TEXT: TBD
 TIME: TBD
 PROFESSOR: Dr. Basil Antar

Repeatability: May be repeated. Maximum 6 hours.

Registration Permission: Consent of instructor.

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| ME | 600 | Doctoral Research/Dissertation (3, 6, 9) |
| SEC. | 002 | CRN 30488 Antar |
| | 003 | CRN 30490 Corda |
| | 004 | CRN 30491 Flandro |
| | 005 | CRN 30492 Majdalani |
| | 020 | CRN 30507 Moeller |
| | 025 | CRN 30513 Steinhoff |

PHYSICS

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|------|-----|---------------------------|
| Phys | 500 | Master's Thesis (3, 6, 9) |
| SEC. | 001 | CRN 32064 Chen |
| | 003 | CRN 32066 Crater |
| | 004 | CRN 32067 Davis |
| | 005 | CRN 32068 Lewis |
| | 006 | CRN 32069 Parigger |

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|------------|-------------------|-----------------------|
| Phys | 593 | Independent Study (3) |
| SEC. | 001 | CRN 32075 |
| TEXT: | TBD | |
| TIME: | Monday & Thursday | 10:00 – 12:00 |
| PROFESSOR: | Dr. Horace Crater | |
| | | B-210 |

This course will cover a variety of materials not normally offered in the academic year and will be tailored to individual student needs. This summer we anticipate offering material in modern physics and introductory quantum mechanics. This will aid students who wish to take the core physics courses (521-522) in quantum mechanics. It will be tailored to the individual students' needs. Engineering students, including students in material science, are encouraged as well as students who wish to enter the physics program. Independently this course will serve those students preparing for the physics preliminary exam.

Repeatability: May be repeated. Maximum 15 hours.

*Phys 594 Special Problems in Physics: Numerical Analysis **CANCELLED**

SEC. 001 CRN 33565
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. Christian Parigger

This special problems/topics course will focus on theoretical/numerical analysis of experiments with contents spanning basics of statistics, mathematics, physics (e.g. sections of traditional core course books from MathMet, Statistical Mechanics, Numerical Methods, Computational Physics) to include Bayesian approaches, maximum likelihood etc, plus sections from selected text on Singular Value Decomposition, Principal Component Analysis, Partial Least Squares including non-linear Partial Least Squares, Chemoetrics, to name a few.

Especially assigned theoretical or experimental work on problems not covered in other courses.

Repeatability: May be repeated. Maximum 9 hours.

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|------|-----|--|----------|
| Phys | 600 | Doctoral Research/Dissertation (3, 6, 9) | |
| SEC. | 001 | CRN 32079 | Crater |
| | 003 | CRN 32081 | Davis |
| | 004 | CRN 32082 | Lewis |
| | 005 | CRN 32083 | Parigger |