

Fall 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>

Fall 2011

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CALENDAR --- FALL SEMESTER 2011

Priority Registration.....	March 21, 2011 – August 16, 2011
Fall 2011 Graduation Application Deadline	August 5, 2011
Admission to Candidacy Forms due for Fall 2011 Commencement	August 5, 2011
Late Registration and late fees begin	August 17 – 26, 2011
Classes begin.....	August 17, 2011
Last Day to final register, add, change grading options or drop without a “W”	August 26, 2011
Labor Day Holiday	September 5, 2011
Graduation Fee Payment Deadline	September 19, 2011
Fall Break (No Classes)	September 29 – 30, 2011
Last day to meet with consultant for Thesis/Dissertation Preliminary Review	October 12, 2011
Deadline to purchase cap/gown and order hood	November 18, 2011
Last day to register to attend graduate hooding	November 18, 2011
Last day to schedule final exam (non-thesis/thesis).....	October 21, 2011
Last day to schedule final exam (dissertation).....	October 28, 2011
Last day to take final exam (non-thesis/thesis/dissertation students)	November 4, 2011
Last day to drop with a “W”	November 8, 2011
Thesis/Dissertation Deadline 5:00 p.m. EST	November 18, 2011
Report of non-thesis/thesis/dissertation defense (Pass/Fail Form)	November 18, 2011
Thanksgiving Holiday.....	November 24 – 25, 2011
Deadline for submission of Admission to Candidacy for students graduating Spring 2012	November 29, 2011
All “INCOMPLETES” must be removed for Graduation	November 29, 2011
Classes End	November 29, 2011
Total withdrawal from the University Deadline	November 29, 2011
Study Period.....	November 30, 2011
Exam Period.....	December 1, 2, 5, 2011
Graduate Hooding (UTK)	December 8, 2011
COMMENCEMENT (UTK)	December 9, 2011
Second thesis/dissertation deadline (Student will receive diploma May 2012 but will not be required to register for Spring 2012)	January 6, 2012
(Defense Completed by November 29, 2011)	

SPRING SEMESTER 2012

Priority Registration for Spring Semester 2012	TBD
Final Registration.....	TBD
Classes begin.....	January 11, 2012
Martin Luther King Day (Holiday).....	January 16, 2012
Spring Break	March 19 – 23, 2012
Spring Recess - Good Friday Holiday	April 6, 2012
Classes End	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

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

**FALL SEMESTER 2011
FINAL STUDY DAY AND EXAM SCHEDULE**

LAST DAY OF CLASSESNovember 29, 2011

STUDY PERIODNovember 30, 2011

FINAL EXAMS - - - December 1, 2, & 5, 2011

REGULAR CLASS TIME (Same Classroom) EXAM TIME

1ST Day - Thursday, December 1, 2011

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 - Friday, December 2, 2011

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 - Monday, December 5, 2011

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 FALL 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 Fall Term 2011

Statement information available on MyUTK.UTK	July 18, 2011
Priority Registration Payment/Confirmation Deadline	August 16, 2011 at 4:30 p.m. (EST)
Late Registration/Late Fees Begin	August 17, 2011
Late Registration Payment/Confirmation Deadline	August 26, 2011

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

August 17 – 23, 2011	\$20 Fee
August 24 – 30, 2011	\$40 Fee
August 31 – September 7, 2011	\$60 Fee
September 8 – 14, 2011	\$80 Fee
September 15 – 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 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)-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 \$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 August 17, 2011. 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. CANCELLED 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
August 17 - 21	NO CHARGE	100%
August 22 - 27	20% CHARGE	80%
August 28 – September 1	40% CHARGE	60%
September 2 – 6	60% CHARGE	40%
September 7 - 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 cancelled 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 **November 29, 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 2011-2012 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.

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.

TECHNICAL WRITING COURSE

**THIS IS A NON-CREDIT COURSE REQUIRED FOR ALL GRAs AT UTSI
AND OPTIONAL FOR ALL OTHER STUDENTS**

ENHANCE YOUR CAREER: Learn to efficiently tackle writing chores and to effectively communicate in writing. This course, designed for scientists and engineers, reviews the most important aspects of clear communication, with an emphasis on organization and coherence. The principles of logic, grammar, and style are considered as they apply to technical documents -- especially proposals, theses, and dissertations. Oral presentations and resumes will also be covered. Contact Dee Merriman at (931) 393-7213 or dmerrima@utsi.edu to enroll in the technical writing course.

INSTRUCTOR: Dr. Mary McLemore

TEXT: John M. Lannon; *Technical Communication*; 10th ed.; Longman;

ISBN# 0321270762

TIME: Thursday 6:00 – 8:00

ROOM: E211

FEE: \$165.00 for non-GRA students

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

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

AEROSPACE ENGINEERING

AE 500 Master's Thesis (3, 6, 9)
SEC. 001 CRN 43547 Antar
009 CRN 43536 Corda
010 CRN 43567 Flandro
011 CRN 43569 Majdalani
012 CRN 43572 Moeller
013 CRN 43573 Schulz
014 CRN 43574 Solies
015 CRN 43577 Steinhoff
021 CRN 43589 Vakili
022 CRN 50042 Moulden

AE 502 Registration for Use of Facilities (1-15)
SEC. 002 CRN 43594 Moeller

AE 511 Inviscid Flow (3) (Video Recorded)
SEC. 002 CRN 49253
TEXT: Karamcheti; *Principles of Ideal Fluids Aerodynamics*; R. E. Krieger Publishing Co;
ISBN 0898741130
TIME: Monday & Thursday 8:30 – 9:45 E-111
PROFESSOR: Dr. Ahmad Vakili

Kinematics and dynamics of inviscid fluids; potential flow about body, conformal mapping.
(DE) Prerequisite(s): 422 or 541, and Mathematics 425.

AE 515 Air Vehicle Aerodynamics and Performance (Same as AS 503) (3) (Video Recorded)
SEC. 001 CRN 47645
TEXT: M. Asselin; *An Introduction to Aircraft Performance*; AIAA Education Series, Reston, VA
1997; ISBN 1-56347-221-X
TIME: Tuesday & Friday 1:00 – 2:15 E-111
PROFESSOR: Dr. Peter Solies

Application of aerodynamics principles to air vehicles to provide estimates of performance, stability, and control characteristics for subsonic to hypersonic speeds. Relations among thrust, drag, lift and attitude, propulsion systems, vehicle performance characteristics, and trajectory optimization.
(DE) Prerequisite(s): 422.

AE 521 Aerodynamics of Compressible Fluids (3)
SEC. 001 CRN 48850
TEXT: John D. Anderson; *Modern Compressible Flow: With Historical Perspectives*; 3rd Edition;

McGraw Hill; ISBN 0-07-242443-5

TIME: Tuesday & Friday 10:45 – 12:00 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): 422.

*AE 531 Magnetohydrodynamics (3) **CANCELLED**

SEC. 001 CRN 48851

TEXT: E.H. Holt and R.E. Haskell; *Foundations of Plasma Dynamics*; 1st Edition; The Macmillan Co., 1965; ISBN Library of Congress catalog card number: 65-14072

TIME: Tuesday & Friday 2:30 – 3:45 F-252

PROFESSOR: Dr. Trevor Moeller

Electromagnetic field theory; chemical kinetics; thermodynamic and thermophysical properties of gas plasmas; governing equations and applications.

(DE) Prerequisite(s): 422 and Mathematics 471.

AE 541 Fluid Mechanics I (3)

SEC. 001 CRN 47648

TEXT: Ronald L. Panton; *Incompressible Flow*; 3rd Edition; John Wiley; ISBN 0-471-26122-X

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

PROFESSOR: Dr. Basil Antar

Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newton's second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows.

Cross-listed: (Same as Biomedical Engineering 541; Engineering Science 541; Mechanical Engineering 541.)

Recommended Background: A fluid mechanics course.

*AE 572 Computational Fluid-Thermal Systems (3) **CANCELLED**

SEC. 001 CRN 47650

TEXT: TBD

TIME: Monday & Thursday 4:00 – 5:15 B-210

PROFESSOR: Dr. John Steinhoff

Modern approximation theory applied to incompressible-thermal flows. Navier-Stokes equations, well-posedness, boundary conditions, non-dimensional groups, conjugate heat transfer, algebraic/differential closure models for turbulence. Weak forms, extremization, finite element/finite volume discrete implementations, a priori error estimates, accuracy, convergence, stability. Numerical linear algebra, sparse matrix methods. Applications in boundary layers, streamfunction-vorticity, pressure projection, free-surface, pseudo-compressibility completion theories. Solution-adaptive h- and r-meshing, optimal solution estimates. Augmentation theories for stability, numerical diffusion, Fourier spectral analyses, optimal forms. Computer projects.

Cross-listed: (Same as Biomedical Engineering 562; Engineering Science 552; Mechanical Engineering 562.)

(DE) Prerequisite(s): 551.

AE 590 Selected Engineering Problems (3)
 SEC. 001 CRN 43607 Antar
 002 CRN 43609 Corda
 003 CRN 43610 Flandro
 004 CRN 48852 Majdalani
 005 CRN 48853 Moeller
 006 CRN 48854 Schulz
 007 CRN 48855 Solies
 008 CRN 48856 Steinhoff
 009 CRN 48857 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 43613
 PROFESSOR: Dr. Ahmad Vakili

AE 599 Special Topics in AE: Particle Simulations (Same as ME 599/ES 581) (3)
 SEC. 001 CRN 43616
 TEXT: C.K. Birdsall and A.B. Langdon; *Plasma Physics Via Computer Simulation*; 1st Edition;
 Adam Hilger; ISBN 0-07-005371-5
 TIME: Monday & Thursday 10:45 – 12:00 F-252
 PROFESSOR: Dr. Trevor Moeller

Computer simulation of plasmas comprises two general areas: fluid and particle descriptions. Fluid description, typically suited to higher plasma densities, are solved using magnetohydrodynamic equations assuming approximate transport coefficients and can be solved using computational fluid dynamics techniques. Many plasmas, however, are of low enough density that the fluid description no longer applies. In these situations, particle simulations are used to simply compute the motions of a collection of charged particles, interacting with each other and applied external fields. This course will cover topics relevant to particle simulations, including particle in cell (PIC), Monte Carlo, particle weighting, particle movers, and field solvers. Students will gain experience with particle simulations through PIC software that is a companion to the text. In addition to those interested in plasmas, this course will be of interest to those interested in particle simulations as they apply to rarified gases.

Repeatability: May be repeated. Maximum 6 hours.
Registration Permission: Consent of instructor.

AE 600 Doctoral Research/Dissertation (3-15)
 SEC. 004 CRN 43628 Antar
 005 CRN 43630 Corda
 006 CRN 43632 Flandro
 007 CRN 43634 Majdalani
 008 CRN 43636 Moeller
 009 CRN 43642 Steinhoff
 019 CRN 50035 Vakili

AE 690 ADVANCED TOPICS IN AEROSPACE ENGINEERING: ADVANCED
 AERODYNAMIC ANALYSIS (3)
 SEC: 001 CRN 43646
 TEXT: Computational Fluid Dynamics: The Basics with Applications; John D. Anderson, Jr.;
 McGraw-Hill, New York; Latest Ed.
 TIME: TBD
 PROFESSOR: Dr. Stephen Corda

This is a PhD 600-level course and as such will cover topics at an advanced level, including use of detailed theoretical and applied analyses. This is a self-study course, therefore the student is expected to invest the required time and effort to learn the course material with minimal formal lectures/explanations by the course instructor. The course learning material will be paced by a series of focused assignments. The student will be guided to read and study the required background theory and material to successfully complete these assignments.

*AE 690 Advanced Topics in Aerospace Engineering: Homotopy Analysis Method (3) **CANCELLED**
 SEC. 004 CRN 50041
 TEXT: Shijun Liao; *Beyond Perturbation: Introduction to the Homotopy Analysis Method*; 1st Edition;
 Chapman and Hall/CRC; ISBN-10: 158488407X ///
 ISBN-13: 978-1584884071
 TIME: Monday & Wednesday 1:00 – 2:15 E-211
 PROFESSOR: Dr. Joseph Majdalani

Solution of nonlinear problems in solid and fluid mechanics and dynamics by use of the Homotopy Analysis Method (HAM). This course introduces a powerful new analytic method for nonlinear problems, HAM, that remains valid in the presence of strong nonlinearities for which other analytical approximations deteriorate. Basic ideas, detailed procedures, and both advantages and limitations of HAM will be covered. Examples are taken from various fields of science and range from simple bifurcations of a nonlinear boundary-value problem to the Thomas-Fermi atom model, Volterra's population model, Von Kármán's swirling viscous flow, and nonlinear progressive waves in deep water.

Prereq: Calculus and ME 540, or consent of Instructor

AVIATION SYSTEMS

AS	500	Master's Thesis (3, 6, 9)
SEC.	001	CRN 48858 Corda
	002	CRN 48859 Martos
	003	CRN 48860 Muratore
	004	CRN 48861 Pujol
	005	CRN 48862 Solies
AS	502	Registration for Use of Facilities (1-15)
SEC.	001	CRN 48863 Corda
	002	CRN 48864 Martos
	003	CRN 48865 Muratore
	004	CRN 48866 Pujol
	005	CRN 48867 Solies

AS 503 Air Vehicles (3) (Same as AE 515) (Video Recorded)
SEC. 001 CRN 48868 (Video Recorded)
TEXT: M. Asselin; *An Introduction to Aircraft Performance*; AIAA Education Series, Reston, VA, 1997; ISBN 1-56347-221-X
TIME: Tuesday & Friday 1:00 – 2:15 E-111
PROFESSOR: Dr. Peter Solies

Current capabilities and future requirements for civilian and military air vehicles. Parameters significant for air vehicle type selection. Integration of air vehicle into aviation systems.
(RE) Prerequisite(s): 518.

AS 508 Flight Test Instrumentation (3)
SEC. 001 CRN 48869 (Video Recorded)
TEXT: TBD
TIME: Monday & Thursday 1:30 – 2:45 E-113
PROFESSOR: John Muratore

Principles of measurement, measuring devices with views toward both ground and flight aerospace testing: measurement fundamentals, sensors for specific parameters (e.g. temperature, heat flux, flow rate, pressure, acceleration, vibration, strain, and humidity), data bus integration, signal condition, telemetry, and fabrication.

AS 510 Special Topics in Aviation Systems: Introduction to Avionics I (3)
SEC. 001 CRN 48870 (Video Recorded)
TEXT: Len Buckwalter; *Avionics Training: Systems, Installation and Troubleshooting*; Latest Edition; Avionics Communications Inc.; ISBN 1-88-5544-21-9
TIME: Tuesday & Friday 10:30 – 11:45 E-111
PROFESSOR: Dr. Alfonso Pujol

Avionic systems and communications, including analog and digital systems, aviation bands and frequencies, satellite and aircraft communications, selective calling, emergency locator transmitter, omnidirectional range, instrument and microwave landing systems, automatic direction finder, and other topics are also discussed.

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 522 Experimental Flight Mechanics: Fixed Wing Stability & Control
SEC. 001 CRN 48871
TEXT: Ralph D. Kimberlin; *Flight Testing of Fixed Wing Aircraft*; AIAA; 1st Edition; ISBN 1-56347-564-2
TIME: Tuesday & Friday 9:30 – 10:45 Airport Classroom
PROFESSOR: Borja Martos

This course will cover fundamental theories, flight test techniques, and data collection and analyses for fixed wing aircraft stability and control. Topics will include static and dynamic longitudinal stability, longitudinal maneuvering stability and control, static and dynamic lateral-directional stability, lateral

control power, and departure testing. Course structure will be weekly classroom academics with approximately 4-6 flight labs evenly distributed during the semester.

This course is designed for full time attendance during the semester and will not be offered as a Distance Learning course.

Prerequisites: *Requires AS516 Aircraft Flight Controls (Stability and Control) and AS521 Experimental Flight Mechanics: Fixed Wing Performance*

AS	550	Project in Aviation Systems (3)	
SEC.	001	CRN 48872	Corda
	002	CRN 48873	Martos
	003	CRN 48874	Muratore
	004	CRN 48875	Pujol
	005	CRN 48876	Solies

BIOMEDICAL ENGINEERING

BME	541	Fluid Mechanics I	
SEC.	003	CRN 49254	
TEXT:	Ronald L. Panton; <i>Incompressible Flow</i> ; 3 rd Edition; John Wiley; ISBN 0-471-26122-X		
TIME:	Tuesday & Friday	9:15 – 10:30	E-211
PROFESSOR:	Dr. Basil Antar		

Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newton's second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows.

Cross-listed: (Same as Aerospace Engineering 541; Engineering Science 541; Mechanical Engineering 541.)

Recommended Background: A fluid mechanics course.

*BME	562	Computational Fluid-Thermal Systems (3) CANCELLED	
SEC.	001	CRN 47674	
TEXT:	TBD		
TIME:	Monday & Thursday	4:00 – 5:15	B-210
PROFESSOR:	Dr. John Steinhoff		

Modern approximation theory applied to incompressible-thermal flows. Navier-Stokes equations, well-posedness, boundary conditions, non-dimensional groups, conjugate heat transfer, algebraic/differential closure models for turbulence. Weak forms, extremization, finite element/finite volume discrete implementations, a priori error estimates, accuracy, convergence, stability. Numerical linear algebra, sparse matrix methods. Applications in boundary layers, streamfunction-vorticity, pressure projection, free-surface, pseudo-compressibility completion theories. Solution-adaptive h- and r-meshing, optimal solution estimates. Augmentation theories for stability, numerical diffusion, Fourier spectral analyses, optimal forms. Computer projects.

Cross-listed: (Same as Aerospace Engineering 572; Engineering Science 552; Mechanical Engineering

562.)

(DE) Prerequisite(s): 551.

BME 610 Advanced Topics in Biomedical Engineering: Medical Imaging (3)

SEC. 002 CRN 49859

TEXT: Jacob Beutel, Harold L. Kundel, Richard L. Van Metter; *Handbook of Medical Imaging*; Vol. 1. Physics and Psychophysics

TIME: Tuesday & Friday 2:30 – 3:45 F-253

PROFESSOR: Dr. Jackie Johnson

Current research topics of interest in biomedical engineering.

Repeatability: May be repeated. Maximum 9 hours.

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

Registration Permission: Consent of instructor.

Grades will be assigned on the basis of a design project or research results (50%), two class presentations (20%), homework (20%) and participation in class discussions (10%).

This course will truly be graduate research based on the current interests of the instructor. The purpose is to take the field further as a group in an area that concentrates on the strengths of the participants.

The first two weeks will explain some basic concepts in medical imaging, which will be made as palatable as possible for the non-mathematician. From then on the instruction and discussion will pertain to real imaging systems – some but not all will be aligned to the glass ceramic studies at UTSI.

There will be no final exam but students will have a choice as to whether to work on the design of some component of an imaging system or detection media or to participate in laboratory research gathering results towards a paper.

COMPUTER SCIENCE

*CS 471 Numerical Analysis (Same as Math 471) (3) **CANCELLED**

SEC. 001 CRN 41612

TEXT: R.L. Burden and J.P. Faires; *Numerical Analysis*; 9th Edition; Thompson Brooks/Cole; ISBN 0-538-73351-9

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

PROFESSOR: Dr. Trevor Moulden

Introduction to computation, instabilities, and rounding. Interpolation and approximation by polynomials and piecewise polynomials. Quadrature and numerical solution of initial and boundary value problems of ordinary differential equations, stiff systems. *Cross-listed: (Same as Math 471.)*

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

SEC. 001 CRN 43948 Bomar

019 CRN 43966 Pujol

020 CRN 43967 Smith

021 CRN 48004 Whitehead

ECE 501 Project in Lieu of Thesis (3)
 SEC. 001 CRN 43968 Bomar
 004 CRN 43971 Pujol
 005 CRN 48007 Smith
 006 CRN 48008 Whitehead

ECE 600 Doctoral Research/Dissertation (3, 6, 9)
 SEC. 020 CRN 48035 Bomar

ENGINEERING MANAGEMENT

EM 501 Capstone Project (3-6)
 SEC. 004 CRN 47725
 PROFESSOR: Dr. Greg Sedrick

Application-oriented project to show competence in major academic area.

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 44111 Sedrick

EM 532 Productivity and Quality Engineering (3)
 SEC. 001 CRN 47728 UTSI students participating at Tullahoma or Oak Ridge
 002 CRN 47729 UTSI students participating elsewhere
 003 CRN 47730 UTK students participating at Knoxville DE classrooms
 004 CRN 47731 UTK students participating elsewhere

TEXT: C. Harold Aikens; *Quality Inspired Management: The Key to Sustainability*; 1st Edition; Prentice Hall; ISBN 13: 978-0131197565

TIME: Monday 4:00 – 6:35 E-113

PROFESSOR: Dr. Greg Sedrick

Productivity and quality measures defined and used to analyze current competitive position of important sectors of American industry with respect to national and international competition. Study of management theorists and systems which promote or inhibit productivity or quality improvements.

EM 533 Theory and Practice of Engineering Management (3)
 SEC. 001 CRN 44113 UTSI students participating at Tullahoma or Oak Ridge
 002 CRN 44114 UTSI students participating elsewhere
 003 CRN 44115 UTK students participating at Knoxville DE classrooms
 004 CRN 44116 UTK students participating elsewhere

TEXT: Lucy C. Morse and Dan L. Babcock; *Managing Engineering and Technology*; 5th Edition;

Prentice Hall; ISBN 10: 0136098096 or 13: 978-0136098096

TIME: Tuesday 4:00 – 6:35 E-113
PROFESSOR: Dr. Greg Sedrick

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 537 Analytical Methods for Engineering Managers (3)
SEC. 001 CRN 47732 UTSI students participating at Tullahoma or Oak Ridge
002 CRN 47733 UTSI students participating elsewhere
003 CRN 47734 UTK students participating at Knoxville DE classrooms
004 CRN 47735 UTK students participating elsewhere
TEXT: William J. Stevenson; *Operations Management*; 10th Edition; McGraw Hill/Irwin;
ISBN 13: 978-0077284091 or 10: 0077284097
TIME: Thursday 4:00 – 6:35 E-113
PROFESSOR: Dr. Greg Sedrick

Survey of management analysis and control systems through industrial engineering techniques. Qualitative and quantitative systems: methods analysis, work measurement, incentive systems, wage and salary development, production and inventory control, facility layout, linear programming, and applied operations research techniques.

Credit Restriction: No credit for student with undergraduate degrees in industrial engineering.

EM 539 Strategic Management in Technical Organizations (3)
SEC. 001 CRN 47736 UTSI students participating at Tullahoma or Oak Ridge
002 CRN 47738 UTSI students participating elsewhere
003 CRN 47739 UTK students participating at Knoxville DE classrooms
004 CRN 47740 UTK students participating elsewhere
TEXT: Fred R. David; *Strategic Management Concepts*; 13th Edition; Prentice Hall;
ISBN 10: 0-13-612099-7 or 10: 0-13-612106-3
TIME: Wednesday 4:00 – 6:35 E-113
PROFESSOR: Dr. Greg Sedrick

Strategic planning process and strategic management in practice; corporate vision and mission; product, market, organizational, and financial strategies; external factors; commercialization of new technologies; and competition and beyond.

(RE) Prerequisite(s): 533 and Industrial Engineering 518 or consent of instructor.

EM 595 Special Topics in Engineering Management (3)
SEC. 001 CRN 44125
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. Greg Sedrick

EM 600 Doctoral Research/Dissertation (3-15)
SEC. 001 CRN 47744 Sedrick

ENGINEERING SCIENCE

ES 500 Master's Thesis (3, 6, 9)
 SEC. 001 CRN 44127 Antar
 009 CRN 44135 Corda
 010 CRN 44136 Flandro
 011 CRN 44137 Majdalani
 012 CRN 44138 Moeller
 017 CRN 44143 Schulz
 018 CRN 44144 Solies
 019 CRN 44145 Steinhoff
 020 CRN 48885 Vakili

ES 502 Registration for Use of Facilities (1-15)
 SEC. 002 CRN 48886 Moeller

ES 541 Fluid Mechanics I (3)
 SEC. 001 CRN 47766
 TEXT: Ronald L. Panton; *Incompressible Flow*; 3rd Edition; John Wiley; ISBN 0-471-26122-X
 TIME: Tuesday & Friday 9:15 – 10:30 E-211
 PROFESSOR: Dr. Basil Antar

Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newton's second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows.

Cross-listed: (Same as Aerospace Engineering 541; Biomedical Engineering 541; Mechanical Engineering 541.)

Recommended Background: A fluid mechanics course.

*ES 552 Computational Fluid-Thermal Systems (3) **CANCELLED**
 SEC. 001 CRN 47770
 TEXT: TBD
 TIME: Monday & Thursday 4:00 – 5:15 B-210
 PROFESSOR: Dr. John Steinhoff

Modern approximation theory applied to incompressible-thermal flows. Navier-Stokes equations, well-posedness, boundary conditions, non-dimensional groups, conjugate heat transfer, algebraic/differential closure models for turbulence. Weak forms, extremization, finite element/finite volume discrete implementations, a priori error estimates, accuracy, convergence, stability. Numerical linear algebra, sparse matrix methods. Applications in boundary layers, streamfunction-vorticity, pressure projection, free-surface, pseudo-compressibility completion theories. Solution-adaptive h- and r-meshing, optimal solution estimates. Augmentation theories for stability, numerical diffusion, Fourier spectral analyses, optimal forms. Computer projects.

Cross-listed: (Same as Aerospace Engineering 572; Biomedical Engineering 562; Mechanical Engineering 562.)

(DE) Prerequisite(s): 551.

ES 581 Special Topics in Engineering Mechanics: Particle Simulations (Same as AE 599/ME 599) (3)

SEC. 001 CRN 47773
 TEXT: C.K. Birdsall and A.B. Langdon; *Plasma Physics Via Computer Simulation*; 1st Edition; Adam Hilger; ISBN 0-07-005371-5
 TIME: Monday & Thursday 10:45 – 12:00 F-252
 PROFESSOR: Dr. Trevor Moeller

Computer simulation of plasmas comprises two general areas: fluid and particle descriptions. Fluid description, typically suited to higher plasma densities, are solved using magnetohydrodynamic equations assuming approximate transport coefficients and can be solved using computational fluid dynamics techniques. Many plasmas, however, are of low enough density that the fluid description no longer applies. In these situations, particle simulations are used to simply compute the motions of a collection of charged particles, interacting with each other and applied external fields. This course will cover topics relevant to particle simulations, including particle in cell (PIC), Monte Carlo, particle weighting, particle movers, and field solvers. Students will gain experience with particle simulations through PIC software that is a companion to the text. In addition to those interested in plasmas, this course will be of interest to those interested in particle simulations as they apply to rarified gases.

Repeatability: May be repeated. Maximum 6 hours.

Registration Permission: Consent of instructor.

ES 595 Engineering Science Seminar (1)
 SEC. 001 CRN 44155
 PROFESSOR: Dr. Ahmad Vakili

ES 600 Doctoral Research/Dissertation (3, 6, 9)
 SEC. 005 CRN 44161 Antar
 006 CRN 44162 Corda
 007 CRN 44163 Flandro
 008 CRN 44164 Majdalani
 012 CRN 47778 Moeller
 013 CRN 48887 Steinhoff

INDUSTRIAL ENGINEERING

IE 516 Statistical Methods in Industrial Engineering (3)
 SEC. 003 CRN 47863
 TEXT: Douglas C. Montgomery, George C. Runger; *Applied Statistics and Probability for Engineers*; 4th Edition; John Wiley and Sons; ISBN 13: 978-0471745891
 TIME: Tuesday & Friday 10:15 – 11:30 E-113
 PROFESSOR: Dr. L. Montgomery Smith

Application of classical statistical techniques to industrial engineering problems. Statistics and statistical thinking in managerial context of organizational improvement; descriptive statistics and distribution theory; relationship between statistical process control techniques and classical statistical tools; parameter estimation and hypothesis testing; goodness-of-fit testing; linear regression and correlation; analysis of variance; single and multiple factor experimental design.

Recommended Background: Statistics 251 or equivalent.

MATERIAL SCIENCE AND ENGINEERING

MSE 500 Master's Thesis (3, 6, 9)
002 CRN 44489 Hofmeister
003 CRN 44490 Johnson, J.
004 CRN 44491 Murray

MSE 503 GRADUATE SEMINAR IN MATERIALS SCIENCE AND ENGINEERING (1)
SEC. 002 CRN 44495
TEXT: No text required for this course
TIME: Wednesday 2:30 – 3:45 CLA Conference Room
PROFESSOR: Dr. William Hofmeister

Admission to MSE graduate program required. All MSE students are required to attend this course.

MSE 600 Doctoral Research/Dissertation (3, 6, 9)
SEC. 002 CRN 44513 Hofmeister
003 CRN 44514 Johnson, J.

MATHEMATICS

MATH 404 Applied Vector Calculus (3) (Video Recorded)
SEC. 001 CRN 44376
TEXT: Wilfred Kaplan; *Advanced Calculus*; 5th Edition; Addison Wesley; ISBN 0-201-79937-5
TIME: Monday & Thursday 10:00 – 11:15 E-113
PROFESSOR: Dr. Kenneth Kimble

Topics from multivariable and vector calculus; line and surface integrals, divergence theorem and the theorems of Gauss and Stokes.
(RE) Prerequisite(s): 241 or 247.

*MATH 471 Numerical Analysis I (Same as CS 471) (3) **CANCELLED**
SEC. 001 CRN 44386
TEXT: R.L. Burden and J.P. Faires; *Numerical Analysis*; 9th Edition; Thompson Brooks/Cole; ISBN 0-538-73351-9
TIME: Monday & Wednesday 2:30 – 3:45 E-111
PROFESSOR: Dr. Trevor Moulden

Introduction to computation, instabilities, and rounding. Interpolation and approximation by polynomials and piecewise polynomials. Quadrature and numerical solution of initial and boundary value problems of ordinary differential equations, stiff systems. *Cross-listed: (Same as Computer Science 471.)*

(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 Master's Thesis (3, 6, 9)
SEC. 001 CRN 44393 Reddy

MATH 517 Mathematical Methods in Physics I (Same as Phys 571) (3)
 SEC. 002 CRN 44398
 TEXT: George Arfken and Hans Weber; *Mathematical Methods for Physicists*; 6th Edition;
 ISBN 0-12-059876-0
 TIME: Monday & Wednesday 10:45 – 12:00 E-211
 PROFESSOR: Dr. Christian Parigger

Linear vector spaces, matrices, tensors, curvilinear coordinates, functions of a complex variable, partial differential equations and boundary value problems, Green's functions, integral transforms, integral equations, spherical harmonics, Bessel functions, calculus of variations.

Cross-listed: (Same as Phys 571.)

Recommended Background: Advanced calculus and differential equations.

MECHANICAL ENGINEERING

ME 500 Master's Thesis (3, 6, 9)
 SEC. 001 CRN 44559 Antar
 021 CRN 44579 Corda
 022 CRN 44580 Flandro
 023 CRN 44581 Majdalani
 024 CRN 44582 Moeller
 025 CRN 44583 Schulz
 034 CRN 48888 Solies
 035 CRN 48889 Steinhoff
 036 CRN 48890 Vakili

ME 502 Registration for Use of Facilities (1-15)
 SEC. 002 CRN 48891 Moeller

ME 511 Heat Transfer I
 SEC. 001 CRN 48068
 TEXT: Glen E. Myers; *Analytical Methods in Conduction Heat Transfer*; Latest Edition; AMCHT;
 ISBN 1-890911-04-6
 TIME: Tuesday & Friday 1:00 – 2:15 E-113
 PROFESSOR: Dr. Basil Antar

Properties of radiating surfaces. Diffuse, specular and directional interchange for gray and nongray surfaces. Interaction with other heat transfer modes. Analysis of steady-state and time-dependent with other heat transfer modes. Analysis of steady-state and time-dependent heat conduction by analytical methods.

Recommended Background: Undergraduate heat transfer course.

ME 521 Thermodynamics I (3)
 SEC. 002 CRN 49255
 TEXT: TBD
 TIME: Wednesday & 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, Schrodinger equation.

Recommended Background: 332.

*ME 525 Combustion and Chemically Reacting Flows I (3) **CANCELLED**
SEC. 001 CRN 49256
TEXT: TBD
TIME: Wednesday & Friday 8:30 – 9:45 E-113
PROFESSOR: Dr. Robert McAmis

Fundamentals: thermochemistry, chemical kinetics and conservation equations; phenomenological approach to laminar flames; diffusion and premixed flame theory; single droplet combustion; deflagration and detonation theory; stabilization of combustion waves in laminar streams; flammability limits of premixed laminar flames; introduction to turbulent flames.

(DE) Prerequisite(s): 522 and 541 or consent of instructor.

*ME 540 Perturbation Methods in Engineering (3) **CANCELLED**
SEC. 001 CRN 48073
TEXT: David C. Wilcox; Perturbation Methods in the Computer Age; 1st Edition; DCW Industries; ISBN 0963605127
TIME: Monday & Wednesday 5:30 – 6:45 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 541 Fluid Mechanics I (3)
SEC. 001 CRN 48074
TEXT: Ronald L. Pantou; *Incompressible Flow*; 3rd Edition; John Wiley; ISBN 0-471-26122-X
TIME: Tuesday & Friday 9:15 – 10:30 E-211
PROFESSOR: Dr. Basil Antar

Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newton's second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows.

Cross-listed: (Same as Aerospace Engineering 541; Biomedical Engineering 541; Engineering Science 541.)

Recommended Background: A fluid mechanics course.

*ME 562 Computational Fluid-Thermal Systems (3) **CANCELLED**
SEC. 001 CRN 48076
TEXT: TBD
TIME: Monday & Thursday 4:00 – 5:15 B-210

PROFESSOR: Dr. John Steinhoff

Modern approximation theory applied to incompressible-thermal flows. Navier-Stokes equations, well-posedness, boundary conditions, non-dimensional groups, conjugate heat transfer, algebraic/differential closure models for turbulence. Weak forms, extremization, finite element/finite volume discrete implementations, a priori error estimates, accuracy, convergence, stability. Numerical linear algebra, sparse matrix methods. Applications in boundary layers, streamfunction-vorticity, pressure projection, free-surface, pseudo-compressibility completion theories. Solution-adaptive h- and r-meshing, optimal solution estimates. Augmentation theories for stability, numerical diffusion, Fourier spectral analyses, optimal forms. Computer projects.

Cross-listed: (Same as Aerospace Engineering 572; Biomedical Engineering 562; Engineering Science 552.)

(DE) Prerequisite(s): 551.

ME 581 Rocket Propulsion I (3)

SEC. 001 CRN 44606

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

TIME: Monday & Wednesday 4:00 – 5:15 E-111

PROFESSOR: Dr. Trevor Moeller

Rocket propulsion fundamentals; thermodynamics of nonreacting and chemically reacting ideal gases, rocket nozzle design; ideal rocket performance parameters; rocket heat transfer; chemistry of propellants; liquid rocket engine systems; ground testing; introduction to solid propellant rockets.

Registration Permission: Consent of instructor.

ME 584 Turbomachinery I (3)

SEC. 01 CRN 48083

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. 001 CRN 44607 Antar
002 CRN 44608 Corda
003 CRN 48090 Flandro
004 CRN 48892 Majdalani
005 CRN 48893 Moeller
006 CRN 48894 Schulz
007 CRN 48895 Solies
008 CRN 48896 Steinhoff
009 CRN 48897 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 44609
 PROFESSOR: Dr. Ahmad Vakili

ME 599 Special Topics in Mechanical Engineering (Same as AE 599/ES 581) (3)
 SEC. 001 CRN 44611
 TEXT: C.K. Birdsall and A.B. Langdon; *Plasma Physics Via Computer Simulation*, 1st Edition; Adam Hilger; ISBN 0-07-005371-5
 TIME: Monday & Thursday 10:45 – 12:00 F-252
 PROFESSOR: Dr. Trevor Moeller

Computer simulation of plasmas comprises two general areas: fluid and particle descriptions. Fluid description, typically suited to higher plasma densities, are solved using magnetohydrodynamic equations assuming approximate transport coefficients and can be solved using computational fluid dynamics techniques. Many plasmas, however, are of low enough density that the fluid description no longer applies. In these situations, particle simulations are used to simply compute the motions of a collection of charged particles, interacting with each other and applied external fields. This course will cover topics relevant to particle simulations, including particle in cell (PIC), Monte Carlo, particle weighting, particle movers, and field solvers. Students will gain experience with particle simulations through PIC software that is a companion to the text. In addition to those interested in plasmas, this course will be of interest to those interested in particle simulations as they apply to rarified gases.

Repeatability: May be repeated. Maximum 6 hours.
Registration Permission: Consent of instructor.

ME 600 Doctoral Research/Dissertation (3, 6, 9)
 SEC. 027 CRN 44641 Antar
 028 CRN 44642 Corda
 029 CRN 49259 Flandro
 030 CRN 49260 Majdalani
 031 CRN 49261 Moeller
 032 CRN 49262 Steinhoff

PHYSICS

PHYS 500 Master's Thesis (3, 6, 9)
 SEC. 002 CRN 42346 Chen
 003 CRN 42434 Crater
 004 CRN 42436 Davis
 005 CRN 42440 Lewis
 006 CRN 42442 Parigger

PHYS 503 Physics Colloquium (1)

SEC. 003 CRN 49263
TEXT: None
TIME: Each 2nd Thursday 3:30 – 5:00 H-111
PROFESSOR: Dr. Lloyd Davis

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 508 Laser Physics (3)
SEC. 001 CRN 48898
TEXT: http://www.amazon.com/Laser-Fundamentals-William-T-Silfvast/dp/0521541050/ref=dp_ob_title_bk
TIME: Monday & Thursday 9:15 – 10:30 F-253
PROFESSOR: Dr. Lloyd Davis

Mode analysis, stable and unstable resonators; rate equations and population inversion, saturation, relaxation oscillations, fluctuations and noise, laser stability; quantum theory of laser, photon coherence; mode-locking, Q-switching and frequency stabilization; specific laser types: semiconductor and solid-state, excimer, copper vapor and dye lasers.

PHYS 511 Theoretical Physics I (3) (Video Recorded)
SEC. 001 CRN 42465
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: one-body, two-body and rigid body dynamics, ideal fluid, small oscillations and waves, elements of special relativity, electrostatic and magneto-static problems, and other modern applications of current interest, in areas of biophysics and astrophysics.
Recommended Background: Familiarity with computational methods.

PHYS 521 Quantum Mechanics (3)
SEC. 002 CRN 48899
TEXT: http://www.amazon.com/Modern-Quantum-Mechanics-2nd-Sakurai/dp/0805382917/ref=cm_cr_pr_product_top#
TIME: Monday & Thursday 10:45 – 12:00 F-253
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.

PHYS 531 Classical Mechanics (3)
SEC. 002 CRN 42473
TEXT: Goldstein; *Classical Mechanics*; 2nd Edition
TIME: Monday & Thursday 2:30 – 3:45 B-210
PROFESSOR: Dr. Horace Crater

Variational formulation, Lagrange's and Hamilton's equations, constraints, canonical transformations, Hamilton-Jacobi theory and action-angle variables.

PHYS 571 Mathematical Methods in Physics I (Same as Math 517) (3)
SEC. 002 CRN 42487
TEXT: George Arfken and Hans Weber; *Mathematical Methods for Physicists*; 6th Edition;
ISBN 0-12-059876-0
TIME: Monday & Wednesday 10:45 – 12:00 E-211
PROFESSOR: Dr. Christian Parigger

Linear vector spaces, matrices, tensors, curvilinear coordinates, functions of a complex variable, partial differential equations and boundary value problems, Green's functions, integral transforms, integral equations, spherical harmonics, Bessel functions, calculus of variations.

Cross-listed: (Same as Mathematics 517.)

PHYS 600 Doctoral Research/Dissertation (3, 6, 9)
SEC. 002 CRN 42507 Crater
003 CRN 42508 Davis
004 CRN 42509 Lewis
005 CRN 42510 Parigger

PHYS 601 Atomic Physics (3)
SEC. 001 CRN 49264
TEXT: B. Bransden and C. Joachain; *Physics of Atoms and Molecules*; 2nd Edition (2003); Prentice Hall; ISBN 978-0-582-35692-4
TIME: Monday & Wednesday 1:00 – 2:15 F-252
PROFESSOR: Dr. Christian Parigger

Survey of research problems and methods. Topics of current interest.

Comment(s): Intended for all graduate students.

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

PHYS 611 Advanced Quantum Mechanics and Field Theory (3)
SEC. 002 CRN 48901
TEXT: Sakurai; *Advanced Quantum Mechanics*
TIME: Monday & Thursday 1:00 – 2:15 B-210
PROFESSOR: Dr. Horace Crater

Survey of problems and methods. Topics of current interest.

Comment(s): Intended for all graduate students.

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