

# *Fall 2012*

## *Registration Announcement*



## *The University of Tennessee Space Institute*

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

[www.utsi.edu](http://www.utsi.edu)

**FUTURE**

**TABLE OF CONTENTS**

Calendar Fall Semester 2012 ..... 1

Final Study Day and Exam Schedule ..... 2

Registration Procedure ..... 3

Financial Calendar ..... 3

Final/Late Registration Period ..... 4

Credit Card Payments ..... 4

Special Billing/Third-Party Billing ..... 4

Toll-Free Numbers ..... 4

Application for Admission ..... 4

Fees ..... 4

Refunds ..... 8

Repayments ..... 8

Total Withdrawal from the University ..... 8

Grades ..... 8

Graduate Student Change of Registration after the Deadline ..... 8

Full-Time Students ..... 8

Removal of “Incomplete” Grade ..... 9

Repeating a Course ..... 9

Admission to Candidacy (MS and PhD) ..... 9

Continuous Registration of Doctoral Students ..... 9

Final Exam for Non-Thesis/Thesis/Dissertation ..... 9

UT Policy on Insurance for International Students ..... 10

General Seminar ..... 10

Final Exam Dates ..... 10

Honor Statement ..... 10

The University of Tennessee Policy on a Drug-Free Campus and Workplace ..... 11

Fall Semester 2012 Course Listings & Descriptions ..... 12

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## CALENDAR --- FALL SEMESTER 2012

Priority Registration.....	March 12, 2012 – August 20, 2012
Fall 2012 Graduation Application Deadline (submit online).....	August 7, 2012
Admission to Candidacy Forms due for Fall 2012 Commencement .....	August 7, 2012
Late Registration and late fees begin .....	August 22 – 31, 2012
Classes begin.....	August 22, 2012
Last Day to final register, add, change grading options or drop without a “W”.....	August 31, 2012
Labor Day Holiday .....	September 3, 2012
Graduation Fee Payment Deadline .....	September 17, 2012
Last day to meet with consultant for Thesis/Dissertation Preliminary Review .....	October 10, 2012
Fall Break (No Classes) .....	October 11– 12, 2012
Deadline to purchase cap/gown and order hood .....	October 29, 2012
Last day to register to attend graduate hooding.....	October 29, 2012
Last day to schedule final exam (non-thesis/thesis).....	October 29, 2012
Last day to schedule final exam (dissertation).....	November 5, 2012
Last day to take final exam (non-thesis/thesis/dissertation students) .....	November 12, 2012
Last day to drop with a “W” .....	November 13, 2012
<b>Thesis/Dissertation Deadline 5:00 p.m. EST .....</b>	<b>November 26, 2012</b>
Report of non-thesis/thesis/dissertation defense (Pass/Fail Form) .....	November 26, 2012
Thanksgiving Holiday.....	November 22 – 23, 2012
Deadline for submission of Admission to Candidacy for students graduating Spring 2013.....	December 4, 2012
All “INCOMPLETES” must be removed for Graduation .....	December 4, 2012
Classes End.....	December 4, 2012
Total withdrawal from the University Deadline .....	December 4, 2012
Study Period.....	December 5, 2012
Exam Period.....	December 6, 7, & 10, 2012
Graduate Hooding Ceremony (UTK) .....	December 14, 2012
COMMENCEMENT (UTK) .....	December 15, 2012
Official Graduation Date.....	December 15, 2012
Second thesis/dissertation deadline (Student will receive diploma May 2013 but will not be required to register for Spring 2013) .....	January 4, 2013
(Defense Completed by December 4, 2012)	

## SPRING SEMESTER 2013

Priority Registration for Spring Semester 2013.....	TBD
Final Registration.....	TBD
Classes begin.....	January 9, 2013
Martin Luther King Day (Holiday).....	January 21, 2013
Spring Recess.....	March 22, 2013
Spring Break .....	March 25 – 29, 2013
Classes End.....	April 26, 2013
Study Period.....	April 29, 2013
Exam Period.....	April 30, May 1, & 2, 2013
Graduate Hooding Ceremony (UTK) .....	May 9, 2013
University College Commencement Ceremonies (UTK) .....	May 8 - 10, 2013
Official Graduation Date.....	May 11, 2013

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

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

[http://registrar.tennessee.edu/academic\\_calendar/index.shtml](http://registrar.tennessee.edu/academic_calendar/index.shtml)

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

**LAST DAY OF CLASSES.....December 4, 2012**

**STUDY DAY .....December 5, 2012**

**FINAL EXAMS - - - December 6, 7, & 10, 2012**

**REGULAR CLASS TIME      (Same Classroom)                      EXAM TIME**

**1ST Day - Thursday, December 6, 2012**

<b>7:45 – 9:00</b>	<b>M/Th</b>	<b>7:45 – 9:45</b>
<b>10:45 – 12:00</b>	<b>M/Th</b>	<b>10:15 – 12:15</b>
<b>9:15 – 10:30</b>	<b>M/Th</b>	<b>1:00 – 3:00</b>
<b>2:30 – 3:45</b>	<b>M/Th</b>	<b>3:30 – 5:30</b>

**2nd Day - Friday, December 7, 2012**

<b>9:15 – 10:30</b>	<b>Tu/Fri</b>	<b>7:45 – 9:45</b>
<b>10:45 – 12:00</b>	<b>Tu/Fri</b>	<b>10:15 – 12:15</b>
<b>1:00 – 2:15</b>	<b>Tu/Fri</b>	<b>1:00 – 3:00</b>
<b>2:30 – 3:45</b>	<b>Tu/Fri</b>	<b>3:30 – 5:30</b>

**3rd Day - Monday, December 10, 2012**

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

**\*\*\*\* 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 2012**

**REGISTRATION PROCEDURE**

**ADVISING**

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

**REGISTRATION**

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

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

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

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

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

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

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

**FINANCIAL CALENDAR**

Statement information available on [MyUTK.UTK.EDU](http://MyUTK.UTK.EDU).....August 1, 2012

Priority Registration Payment/Confirmation Deadline.....August 20, 2012 at 4:30 p.m. (EST)

Late Registration/Late Fees Begin.....August 22, 2012

Late Registration Payment/Confirmation Deadline.....August 31, 2012 at 4:30 p.m. (EST)

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

**\*\*\*FINAL/LATE REGISTRATION PERIOD – currently unavailable, but will be listed at the link below once published:**

<http://web.utk.edu/~bursar/volxfees.html#final>

## **CREDIT CARD PAYMENTS**

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

## **SPECIAL BILLING – THIRD PARTY BILLING:**

The Budget and Finance Office will generate a billing after the student has provided a letter of authorization from the third party sponsor. Authorization must include the sponsor's name and address as well as the maximum amount which will be paid for each specific term. The authorization can be mailed to UTSI Budget and Finance Office, MS#12, 411 B.H. Goethert Parkway, Tullahoma, TN 37388-9700 or email it to [jboyles@utsi.edu](mailto: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](mailto:jboyles@utsi.edu).

## **TOLL-FREE NUMBERS**

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

## **APPLICATION FOR ADMISSION**

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

## **FEES**

Late fees will begin on August 22, 2012. The only credit/debit cards The University of Tennessee Space Institute accepts are Visa, MasterCard and Discover.

## NEW FOR FALL 2011

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

UTSI students are assessed the per hour rate for the following: Maintenance, Tuition (if out-of-state), the UTSI Activity Fee, and any course fees that may be associated with a particular class. UTSI students taking mixed campus courses will follow the same fee assessment rules as above. The total per hour fee assessment will not exceed the Full-Time rate of 9 hours for Graduate students.

### FEES OF DISTANCE STUDENTS

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

Aviation Systems	Peter Solies	931-393-7289	<a href="mailto:psolies@utsi.edu">psolies@utsi.edu</a>
Engineering Mgt.	Charlotte Henley	931-393-7293	<a href="mailto:chenley@utsi.edu">chenley@utsi.edu</a>

### TUITION AND/OR MAINTENANCE FEES

#### Full Fees for In-State Students (per semester)

Maintenance Fee .....	\$4,500.00*
Programs and Services Fee .....	90.00
Total .....	\$4,590.00

#### Full Fees for Out-Of-State Students (per semester)

Maintenance Fee .....	\$4,500.00*
Programs and Services Fee .....	90.00
Tuition .....	\$9,094.00*
Total .....	\$13,684.00

**An additional \$54.00 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	\$501.00 per semester hour
3 hours	\$1,503.00
OUT-OF-STATE	\$1,512.00 per semester hour
3 hours	\$4,536.00

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

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

## **RETURNED CHECK POLICY**

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

## **DEFERRED PAYMENT PLAN**

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



## LATE PAYMENT FEES

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

## TUITION/FEES POLICY FOR DROPPED COURSES OR WITHDRAWAL

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

\*\*\*\*\*

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

\*\*\*\*\*

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

**\*\*\*Drop/Withdrawal Dates and Percentages Charged are currently unavailable, but will be listed at the link below once published:**

<http://web.utk.edu/~bursar/regchang.html#Fall>

## 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.

## **TOTAL WITHDRAWAL 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 2012 must remove all INCOMPLETE GRADES by **December 4, 2012**. Contact Charlene Hane, Student Services, to remove an Incomplete Grade.

## **REPEATING A COURSE**

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

## **ADMISSION TO CANDIDACY**

### **MASTER OF SCIENCE DEGREE:**

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

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

### **DOCTORAL DEGREE:**

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

## **CONTINUOUS REGISTRATION OF DOCTORAL STUDENTS**

Course 600 is reserved for doctoral research and dissertation hours. Initial registration for 600 should be determined by each department and generally corresponds to the time at which a student begins work actively on dissertation research. From this time on, students are required to register continuously for at least 3 hours of 600 each semester, including summer term. A minimum total of 24 hours of course 600 is required.

A student who will not be using faculty services and/or university facilities for a period of time may request leaves of absence from dissertation research up to a maximum of six terms (including summer terms). The request (form found online at [http://gradschool.utk.edu/forms/leaveofabsence\\_reader.pdf](http://gradschool.utk.edu/forms/leaveofabsence_reader.pdf)) should be completed by the student and then sent to the major professor (advisor) for endorsement. The completed form is then submitted to Graduate School for review and processing.

## **FINAL EXAM FOR NON-THESIS, CAPSTONE PROJECT STUDENTS, THESIS AND DISSERTATION STUDENTS**

A candidate presenting a thesis or dissertation must pass a final oral examination on all work offered for the degree. The examination is scheduled through Student Services. Failure to notify Student Services of the examination date will put the student at risk for graduating that semester. Final examinations not properly scheduled **MUST** be repeated. The final draft of the thesis must be distributed to the committee members at least two weeks prior to the date of the final examination. In case of a grade of "Fail", the candidate may not apply for re-examination until the following semester. The result of the second examination is final.

## **UT POLICY ON INSURANCE FOR INTERNATIONAL STUDENTS**

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

## **GENERAL SEMINAR**

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

## **FINAL EXAM DATES**

**STUDY PERIOD – December 5, 2012**

**FINAL EXAMS – December 6, 7, & 10, 2012**

## **HONOR STATEMENT**

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

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

For official information on all UTK Graduate School policies, refer to the current UTK Graduate Catalog available at <http://catalog.utk.edu>. The student handbook "Hilltopics" is available in Student Services, D-100 or online at <http://dos.utk.edu/files/HT2011revised.pdf>.

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

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

**AEROSPACE ENGINEERING**

AE 500 Master's Thesis (1-15)  
SEC. 001 CRN 43458 Antar  
009 CRN 43474 Corda  
010 CRN 43478 Flandro  
011 CRN 43480 Majdalani  
012 CRN 43483 Moeller  
013 CRN 43484 Schulz  
014 CRN 43485 Solies  
015 CRN 43488 Steinhoff  
021 CRN 43500 Vakili

AE 502 Registration for Use of Facilities (1-15)  
SEC. 002 CRN 43505 Moeller

AE 511 Inviscid Flow (3)  
SEC. 002 CRN 48867  
TEXT: Karamcheti; *Principles of Ideal Fluids Aerodynamics*; R. E. Krieger Publishing Co;  
ISBN 0898741130  
TIME: Tuesday & Thursday 2:40 – 3:55 E-110  
PROFESSORS: Dr. Ahmad Vakili and Dr. James Masters

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

AE 515 Air Vehicle Aerodynamics and Performance (Same as AS 503) (3)  
SEC. 001 CRN 47265 (Video Recorded)  
TEXT: M. Asselin; *An Introduction to Aircraft Performance*; AIAA Education Series, Reston, VA  
1997; ISBN 1-75-623241-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 48466  
TEXT: John D. Anderson; *Modern Compressible Flow: With Historical Perspectives*; 3rd Edition;

McGraw Hill; ISBN 0-07-242443-5.

H.W. Liepmann and A. Roshko; *Elements of Gasdynamics*; Dover Publications;

ISBN-10: 0486419630; ISBN-13: 978-0486419633

> [Visit Amazon's H. W. Liepmann Page](#)

TIME: Tuesday & Thursday 10:10 – 11:25 E-110  
PROFESSOR: Dr. Trevor Moeller

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

AE 531 Magnetohydrodynamics (Same as ME 599 008) (3)

SEC. 001 CRN 48467

TEXT: Foundations of Plasma Dynamics; E.H. Holt and R.E. Haskell; The Macmillan Co.; 1965; Available from Dover books. Supplemental information will be provided by the instructor.

TIME: Monday & Wednesday 10:10 – 11:25 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): Mathematics 471.*

AE 533 Dynamics (3)

SEC. 002 CRN 50624

TEXT: Advanced Engineering Dynamics; Ginsberg; ISBN-9780521883030

TIME: Monday & Wednesday 1:10 – 2:25 E-110

PROFESSOR: Dr. Xiaopeng Zhao

Kinematics and dynamics of particles in three dimensions. Rotating coordinate systems. Hamilton's principle. Lagrange's equations of motion. Kinematics and dynamics of rigid bodies.

*Cross-listed: (Same as Mechanical Engineering 533)*

*Recommended Background: 391 or Mathematics 431 and an undergraduate vibrations course.*

AE 535 Mechanical Vibrations (3)

SEC. 003 CRN 50628

TEXT: TBD

TIME: TBD

PROFESSOR: Dr. Toby Boulet

Vibrations of linear, discrete, undamped and damped systems. Lagrange's equations for holonomic systems. Modal analysis. Laplace transform. Response to mechanical transients.

*Cross-listed: (Same as Biomedical Engineering 534; Mechanical Engineering 534.)*

*Recommended Background: An undergraduate vibrations course.*

AE 541 Fluid Mechanics I (3)

SEC. 001 CRN 47268

TEXT: <http://www.engr.utk.edu/mabe/syllabi/ME%20541.pdf>

Viscous Fluid Flow; White; ISBN-9780072402315

TIME: Tuesday & Thursday 1:10 – 2:25 E-110

PROFESSOR: Dr. Rao Arimilli

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; Mechanical Engineering 541.)*

*Recommended Background: A fluid mechanics course.*

AE	590	Selected Engineering Problems (3)	
SEC.	002	CRN 43520	Corde
	003	CRN 43521	Flandro
	004	CRN 48468	Majdalani
	005	CRN 48469	Moeller
	006	CRN 48470	Schulz
	007	CRN 48471	Solies
	008	CRN 48472	Steinhoff
	009	CRN 48473	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 43524	
TEXT:	None		
TIME:	Will be announced through email		
PROFESSOR:	Dr. Ahmad Vakili		

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

AE	599	Special Topics in Aerospace Engineering: Computational Fluid Dynamics (3)	
SEC.	001	CRN 43527	
TEXT:	Handouts provided by instructor		
TIME:	Monday & Wednesday	11:40 – 12:55	E-110
PROFESSOR:	Dr. Greg Power		

This course uses a commercial CFD code that is widely accepted and used in industries and government labs as a hands-on introduction to computational fluid dynamics. After a brief review of the fundamentals, the course will cover various aspects of the simulation process including geometry modeling, grid generation, solution strategy and post processing primarily through practical examples that bring out the importance of proper understanding of the underlying physics for the problem. Examples will also attempt to cover a wide range of problems that cover different types of flow conditions (incompressible/compressible, laminar/turbulent, steady/unsteady flows, free surface flows, flows with heat transfer and possibly reacting flows).

*Repeatability: May be repeated. Maximum 6 hours.*



AE 599 Special Topics in AE: Selected Problems in Aerodynamics (3) (Pre-Recorded)  
 SEC. 002 CRN 43528  
 TEXT: Flandro, G.A., McMahon, H.M., Roach, L.R.; Basic Aerodynamics – Incompressible Flow;  
 Cambridge University Press, New York, NY, 2012; ISBN 978-0-521-80582-7  
 TIME: TBD  
 PROFESSOR: Dr. Peter Solies

The course starts with a review of basic aerodynamic principles and then focuses on problem solving in applied aerodynamics. Topics include: Standard Atmosphere, Aerostatics, Aircraft Pitot-Static System, Determination of Center of Pressure and Aerodynamic Center, Conservation Principles, Momentum Rake, Propeller Thrust, Potential Flow, Special Airfoils, High Lift Devices, Powered Lift, Lift-Induced Drag, Viscous Drag, Optimization of Wing Planforms, Stall Characteristics, Lift and Drag of Wings in Formation, Air Vehicle Aerodynamics.

AE 600 Doctoral Research/Dissertation (3-15)  
 SEC. 004 CRN 43539 Antar  
 005 CRN 43541 Corda  
 006 CRN 43543 Flandro  
 007 CRN 43545 Majdalani  
 008 CRN 43547 Moeller  
 014 CRN 43553 Steinhoff  
 015 CRN 43554 Vakili

#### AVIATION SYSTEMS

AS 500 Master's Thesis (1-15)  
 SEC. 001 CRN 48474 Corda  
 002 CRN 48475 Martos  
 003 CRN 48476 Muratore  
 004 CRN 48477 Pujol  
 005 CRN 48478 Solies

AS 502 Registration for Use of Facilities (1-15)  
 SEC. 001 CRN 48479 Corda  
 002 CRN 48480 Martos  
 003 CRN 48481 Muratore  
 004 CRN 48428 Pujol  
 005 CRN 48483 Solies

AS 503 Air Vehicles (3) (Same as AE 515)  
 SEC. 001 CRN 50283 (Video Recorded)  
 TEXT: M. Asselin; *An Introduction to Aircraft Performance*; AIAA Education Series, Reston, VA,  
 1997; ISBN 1-75-623241-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 510 Special Topics in Aviation Systems: Introduction to Avionics I (3) (Video Recorded)  
 SEC. 001 CRN 48486  
 TEXT: Principles of Avionics; 7th Edition; Albert Helfrick; Avionics Communications  
 (<http://www.avionics.com>); ISBN 13:9781885544278  
 TIME: Tuesday & Friday 9:15 – 10:30 E-113  
 PROFESSOR: Dr. Monty Smith

Electronic instrumentation, navigation, communication, guidance and control systems used in aviation. The primary topics to be covered in the first semester include: terrestrial en route radio navigation systems, terrestrial landing aids, satellite navigation systems, and surveillance systems.

AS 522 Experimental Flight Mechanics: Fixed Wing Stability & Control  
 SEC. 001 CRN 48487  
 TEXT: Ralph D. Kimberlin; *Flight Testing of Fixed Wing Aircraft*; AIAA; 1<sup>st</sup> Edition;  
 ISBN 1-56347-564-2  
 TIME: Tuesday & Friday 10:30 – 11:45 Airport Classroom  
 PROFESSOR: Borja Martos

Stability and control. Experimental techniques for flight mechanics. Specially equipped airborne laboratory: student participation in series of experiments demonstrating acquisition of flight test data. Necessary theory supports class experiments. Tests cover broad range of aircraft performance, stability and control characteristics in addition to instrumentation and data reduction methods.  
 (RE) Prerequisite(s): AS 516 (AE 599) “Aircraft Controls”.

AS 550 Project in Aviation Systems (3)  
 SEC. 001 CRN 48488 Corda  
 002 CRN 48489 Martos  
 003 CRN 48490 Muratore  
 004 CRN 48491 Pujol  
 005 CRN 48492 Solies

## BIOMEDICAL ENGINEERING

BME 474 Biomaterials  
 SEC. 002 CRN 50626  
 TEXT: TBD  
 TIME: Tuesday & Thursday 11:40 – 12:55 E-110  
 PROFESSOR: Dr. Wei He

Metals, polymers, and ceramics utilized in orthopedic, cardiovascular, and dental surgical implant devices. Corrosion and degradation problems. Material properties of primary importance and tissue response to synthetic materials.  
 Cross-listed: (Same as Material Science Engineering 474.)  
 (RE) Prerequisite(s): 201.

BME 500 Master’s Thesis (1-15)  
 SEC. 012 CRN 50299 Johnson

BME 534 Mechanical Vibrations (3)  
SEC. 003 CRN 50629  
TEXT: TBD  
TIME: TBD  
PROFESSOR: Dr. Toby Boulet

Vibrations of linear, discrete, undamped and damped systems. Lagrange's equations for holonomic systems. Modal analysis. Laplace transform. Response to mechanical transients.  
*Cross-listed: (Same as Aerospace Engineering 535; Mechanical Engineering 534.)*  
*Recommended Background: An undergraduate vibrations course.*

BME 541 Fluid Mechanics I  
SEC. 001 CRN 47291  
TEXT: <http://www.engr.utk.edu/mabe/syllabi/ME%20541.pdf>  
TIME: Tuesday & Thursday 1:10 – 2:25 E-110  
PROFESSOR: Dr. Rao Arimilli

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; Mechanical Engineering 541.)*  
*Recommended Background: A fluid mechanics course.*

BME 595 Biomedical Seminar (1)  
SEC. 002 CRN 49718  
TEXT: None  
TIME: Will be announced through email  
PROFESSOR: Dr. Jacqueline Johnson

BME 599 Special Topics in BME: Math for Biomedical Engineers I (3)  
SEC. 001 CRN 43586  
TEXT: Mathematical Methods for Science Students; G. Stephenson; Logman Scientific and Technical; Second Edition; ISBN: 0-582-44416-0  
TIME: Tuesday & Thursday 8:40 – 9:55 E-110  
PROFESSOR: Dr. Jackie Johnson

Curve fitting (linear, polynomial, nonlinear), fitting functions, bounds and constraints, weighted fitting, global fitting. Peak analysis (baseline detection, peak finding, peak integration, peak fitting). Interpolation, extrapolation, differentiation, integration and normalization.  
*Repeatability: May be repeated. Maximum 12 hours.*  
*Registration Permission: Consent of instructor.*

BME 600 Doctoral Research/Dissertation (3-15)  
SEC. 011 CRN 49723 Johnson

## COMPUTER SCIENCE

CS 471 Numerical Analysis (Same as MATH 471) (3) (Video Recorded)  
SEC. 001 CRN 41602  
TEXT: Numerical Analysis; Richard L. Burden and J. Douglas Faires; Brooks Cole; 9<sup>th</sup> Edition;

ISBN-10: 0538733519; ISBN-13: 978-0538733519

TIME: Monday & Thursday

10:00 – 11:15

E-111

PROFESSOR: Dr. Chad Limbaugh

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 (1-15)

SEC. 027 CRN 50300 Smith

ECE 501 Project in Lieu of Thesis (3)

SEC. 001 CRN 43876 Smith

ECE 600 Doctoral Research/Dissertation (3-15)

SEC. 006 CRN 43901 Bomar

## **ENGINEERING MANAGEMENT**

EM 501 Capstone Project (3-6)

SEC. 001 CRN 44017

PROFESSOR: Dr. James L. Simonton

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 501 Capstone Project (3-6)

SEC. 002 CRN 44018

PROFESSOR: Dr. Denise Jackson

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 501 Capstone Project (3-6)

SEC. 004 CRN 47345

TEXT: *Practical Research: Planning and Design Plus MyEducationLab with Pearson*, Paul Leedy and Jeanne Ormrod, 10th edition, Pearson, ISBN-10: 0132893614, ISBN-13: 9780132893619

PROFESSOR: Dr. Greg Sedrick\*

**\*Note: Dr. Sedrick requires textbook for first time registration**

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 44019 Simonton

002 CRN 44020 Sedrick

EM 532 Productivity and Quality Engineering (3)

SEC. 001 CRN 47348 UTSI students participating at Tullahoma

002 CRN 47349 UTSI students participating elsewhere

003 CRN 47350 UTK students participating at Knoxville DE classrooms

004 CRN 47351 UTK students participating elsewhere

TEXT: *The Principles of Scientific Management*, F. W. Taylor, (1911) 2004 ed., Kessinger Publishing Co., New York, ISBN# 0486299880; *The New Economics*, W. E. Deming; (2000) MIT Press, Cambridge, MA; ISBN# 0738203807; *Corporate Cultures: The Rites and Rituals of Corporate Life*, T. E. Deal and A. A. Kennedy (2000), 4<sup>th</sup> ed., Perseus Books, Reading, MA, ISBN# 0262541165

TIME: Thursday 4:00 – 6:35 E-113

PROFESSOR: Dr. James L. Simonton

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 44021 UTSI students participating at Tullahoma

002 CRN 44022 UTSI students participating elsewhere

003 CRN 44023 UTK students participating at Knoxville DE classrooms

004 CRN 44024 UTK students participating elsewhere

TEXT: *Paradigms: The Business of Discovering the Future*, J. A. Barker, (1993), Harper Business Press, New York, ISBN# 10: 0887306470 13: 978-0887306471

*Productive Workplaces Revisited: Dignity, Meaning and Community in the 21st Century*,  
M. R. Weisbord, (2004) Pfeifer, ISBN # 0787971170

TIME: Tuesday 4:00 – 6:35 E-113  
PROFESSOR: Dr. James L. Simonton

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 47352 UTSI students participating at Tullahoma or Oak Ridge  
002 CRN 47353 UTSI students participating elsewhere  
003 CRN 47354 UTK students participating at Knoxville DE classrooms  
004 CRN 47355 UTK students participating elsewhere  
TEXT: William J. Stevenson; *Operations Management*; 10<sup>th</sup> Edition 2009; McGraw Hill/Irwin;  
ISBN 13: 978-0077284091 or 10: 0077284097  
TIME: Monday 4:00 – 6:35 E-113  
PROFESSOR: Dr. Denise Jackson

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 47356 UTSI students participating at Tullahoma  
002 CRN 47358 UTSI students participating elsewhere  
003 CRN 47359 UTK students participating at Knoxville DE classrooms  
004 CRN 47360 UTK students participating elsewhere  
TEXT: *Strategic Management: A Competitive Advantage Approach, Concepts*, Fred R. David, 14th Edition, Prentice Hall, ISBN 10: 0132666219 or 13:9780132666213  
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 Projects in Engineering Management: Project Management (3)  
SEC. 001 CRN 44033  
TEXT: TBD  
TIME: TBD  
PROFESSOR: Dr. James Simonton

Problems and topics relevant to current issues in the field.  
*Repeatability: May be repeated if topic differs. Maximum 6 hours.*

EM 600 Doctoral Research/Dissertation (3-15)  
SEC. 001 CRN 47364 Simonton

### INDUSTRIAL ENGINEERING

IE 516 Statistical Methods in Industrial Engineering (3)  
SEC. 003 CRN 47483 UTSI students participating at Tullahoma  
004 CRN 47484 UTSI students participating elsewhere  
TEXT: *Probability and Statistics for Engineers and Scientists*, Hayter, A. (2007), (2nd ed),  
Duxbury Publishing, Belmont, CA, ISBN 0-534-38669-5  
TIME: Wednesdays 1:00 – 3:20 E-110  
PROFESSOR: Dr. James Simonton

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 474 Biomaterials  
SEC. 002 CRN 50627  
TEXT: TBD  
TIME: Tuesday & Thursday 11:40 – 12:55 E-110  
PROFESSOR: Dr. Wei He

Metals, polymers, and ceramics utilized in orthopedic, cardiovascular, and dental surgical implant devices. Corrosion and degradation problems. Material properties of primary importance and tissue response to synthetic materials.  
*Cross-listed: (Same as Biomedical Engineering 474.)*  
*(RE) Prerequisite(s): 201.*

MSE 500 Master's Thesis (1-15)  
002 CRN 44395 Hofmeister  
  
MSE 600 Doctoral Research/Dissertation (3-15)  
SEC. 002 CRN 44418 Hofmeister

## MATHEMATICS

MATH 404 Applied Vector Calculus (3)  
SEC. 001 CRN 44283  
TEXT: *Vector Calculus*; Paul C. Matthews; Springer; ISBN-10: 3540761802;  
ISBN-13: 978-3540761808  
TIME: Monday & Thursday 3:00 – 4:15 F-252  
PROFESSOR: Dr. Jan Zijlstra

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 (Same as CS 471) (3) (Video Recorded)  
SEC. 001 CRN 44293  
TEXT: *Numerical Analysis*; Richard L. Burden and J. Douglas Faires; Brooks Cole; 9<sup>th</sup> Edition;  
ISBN-10: 0538733519; ISBN-13: 978-0538733519  
TIME: Monday & Thursday 10:00 – 11:15 E-111  
PROFESSOR: Dr. Chad Limbaugh

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 511 Methods in Applied Mathematics I (3) (Video Recorded) **CANCELLED**  
SEC. 001 CRN 50328  
TEXT: *Applied Analytic Mathematics for Physical Scientists*; Cushing; Wiley; 2<sup>nd</sup> Edition  
*Essential Mathematical Methods for the Physical Sciences*; K.F. Riley and M.P.  
Hobson; Cambridge University Press.  
TIME: Monday & Thursday 10:00 – 11:15 E-113  
PROFESSOR: Dr. Horace Crater

Fundamentals and techniques associated with discrete models of physical, engineering and biological systems: difference equations, networks and graphs, optimization, and other topics.

*Recommended Background: Courses in advanced calculus and linear algebra.*

MATH 511-512 is a two-semester course targeted for engineering students who have taken MATH 404 and 435 (vector analysis and partial differential equations) and who need additional math courses for their research or advanced courses. Math Methods (Physics 571,573(2) or MATH 517-518) is currently a two semester course with the second (573(2)) being a numerical methods course for solutions of physical problems. The plan in teaching MATH 511-512 would be to follow the logical progression of a general advanced level physics course (in the old days it was called theoretical physics, at the senior level) with the mathematical methods that are new to the student (and likely to be of value) introduced in the context of the progression of the (classical) physics subjects covered.

Topics and applications include: Calculus of variations & Euler Lagrange equations; Tensors & elastic and viscous media; Complex variable, Fourier series and transforms & the forced and damped



and coupled harmonic oscillators ; Special Functions & Classical Field Theories (Plasmas, Electrodynamics and Gravity), Perturbation theory and nonperturbative methods & scattering theory; Complex variables (conformal mapping) & fluid flow and problems in potential theory; Perturbation theory and Classical Chaos...

The physics needed will be introduced as the corresponding math topics are introduced.

MATH 517 Mathematical Methods in Physics I (Same as PHYS 571) (3)

SEC. 002 CRN 44305

TEXT: Arfken et al. 7<sup>th</sup> Edition; Arfken reference; [http://www.amazon.com/Mathematical-Methods-Physicists-Seventh-Comprehensive/dp/0123846544/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1328812143&sr=1-1](http://www.amazon.com/Mathematical-Methods-Physicists-Seventh-Comprehensive/dp/0123846544/ref=sr_1_1?s=books&ie=UTF8&qid=1328812143&sr=1-1)  
Boas 3<sup>rd</sup> Edition; Boas reference; [http://www.amazon.com/Mathematical-Methods-Physical-Sciences-Mary/dp/0471198269/ref=pd\\_vtp\\_b\\_1](http://www.amazon.com/Mathematical-Methods-Physical-Sciences-Mary/dp/0471198269/ref=pd_vtp_b_1)

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

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 (1-15)

SEC. 001 CRN 44464 Antar  
021 CRN 44484 Corda  
022 CRN 44485 Flandro  
023 CRN 44486 Majdalani  
024 CRN 44487 Moeller  
025 CRN 44488 Schulz  
034 CRN 48504 Solies  
035 CRN 48505 Steinhoff  
036 CRN 48506 Vakili

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

SEC. 002 CRN 48507 Moeller

ME 511 Heat Transfer I

SEC. 001 CRN 47686

TEXT: Glen E. Myers; *Analytical Methods in Conduction Heat Transfer*; Latest Edition; AMCHT; ISBN 1-890911-04-6

TIME: Monday & Wednesday 4:05 – 5:20 E-111

PROFESSOR: Dr. Joseph Majdalani

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 48869  
TEXT: TBD  
TIME: Monday & Wednesday 2:40 – 3:55 E-110  
PROFESSOR: Dr. Joseph Wehrmeyer

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

*Recommended Background: Undergraduate thermodynamics.*

ME 533 Dynamics (3)  
SEC. 002 CRN 50625  
TEXT: TBD  
TIME: Monday & Wednesday 1:10 – 2:25 E-110  
PROFESSOR: Dr. Xiaopeng Zhao

Kinematics and dynamics of particles in three dimensions. Rotating coordinate systems. Hamilton's principle. Lagrange's equations of motion. Kinematics and dynamics of rigid bodies.

*Cross-listed: (Same as Aerospace Engineering 533.)*

*Recommended Background: 391 or Mathematics 431 and an undergraduate vibrations course.*

ME 534 Mechanical Vibrations (3)  
SEC. 003 CRN 50630  
TEXT: TBD  
TIME: TBD  
PROFESSOR: Dr. Toby Boulet

Vibrations of linear, discrete, undamped and damped systems. Lagrange's equations for holonomic systems. Modal analysis. Laplace transform. Response to mechanical transients.

*Cross-listed: (Same as Aerospace Engineering 535; Biomedical Engineering 534.)*

*Recommended Background: An undergraduate vibrations course.*

ME 540 Perturbation Methods (3)  
SEC. 001 CRN 47691 (Video Recorded)  
TEXT: Class Notes  
TIME: Monday & Wednesday 10:10-11:25 E-110  
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 47692

TEXT: <http://www.engr.utk.edu/mabe/syllabi/ME%20541.pdf>  
TIME: Tuesday & Thursday 1:10 – 2:25 E-110  
PROFESSOR: Dr. Rao Arimilli

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.)*

*Recommended Background: A fluid mechanics course.*

ME 581 Rocket Propulsion I (3) (Pre-Recorded)  
SEC. 001 CRN 44511  
TEXT: George P. Sutton; *Rocket Propulsion Elements*; 8<sup>th</sup> Edition; Wiley, New York 2001; ISBN 0471326429  
TIME: TBD  
PROFESSOR: Dr. Joseph Majdalani

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 Systems I (3)  
SEC. 001 CRN 47701  
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 44512 Antar  
002 CRN 44513 Corda  
003 CRN 47708 Flandro  
004 CRN 48508 Majdalani  
005 CRN 48509 Moeller  
006 CRN 48510 Schulz  
007 CRN 48511 Solies  
008 CRN 48512 Steinhoff  
009 CRN 48513 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 44514  
TEXT: None  
TIME: Will be announced through email  
PROFESSOR: Dr. Ahmad Vakili

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

ME 599 Special Topics in Mechanical Engineering: Computational Fluid Dynamics (3)  
SEC. 001 CRN 44516  
TEXT: Handouts provided by instructor  
TIME: Monday & Wednesday 11:40 – 12:55 E-110  
PROFESSOR: Dr. Greg Power

This course uses a commercial CFD code that is widely accepted and used in industries and government labs as a hands-on introduction to computational fluid dynamics. After a brief review of the fundamentals, the course will cover various aspects of the simulation process including geometry modeling, grid generation, solution strategy and post processing primarily through practical examples that bring out the importance of proper understanding of the underlying physics for the problem. Examples will also attempt to cover a wide range of problems that cover different types of flow conditions (incompressible/compressible, laminar/turbulent, steady/unsteady flows, free surface flows, flows with heat transfer and possibly reacting flows).

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

ME 599 Special Topics in ME: Magnetohydrodynamics (Same as AE 531) (3)  
SEC. 008 CRN 50682  
TEXT: Foundations of Plasma Dynamics; E.H. Holt and R.E. Haskell; The Macmillan Co.; 1965;  
Available from Dover books. Supplemental information will be provided by the instructor.  
TIME: Monday & Wednesday 10:10 – 11:25 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): Mathematics 471.*

ME 600 Doctoral Research/Dissertation (3-15)  
SEC. 015 CRN 44534 Antar  
016 CRN 44535 Corda  
018 CRN 44537 Flandro  
019 CRN 44538 Majdalani  
027 CRN 44546 Moeller  
028 CRN 44547 Steinhoff

## PHYSICS

PHYS 500 Master's Thesis (1-15)  
SEC. 002 CRN 42263 Chen  
003 CRN 42351 Crater  
004 CRN 42353 Davis  
005 CRN 42357 Lewis  
006 CRN 42359 Parigger

PHYS 503 Physics Colloquium (1)  
SEC. 002 CRN 42380  
TEXT: None  
TIME: 2<sup>nd</sup> & 4<sup>th</sup> Thursday 3:30 – 5:00 H-111  
PROFESSOR: Dr. Horace Crater

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.*

Physics seminars given by or chosen by students. (Note this course number will be 503 for students who have less than 6 credits in PHYS 503 – and 599 for those with more than 6 credits in PHYS 503.)

\*PHYS 505 Physics of Fluids (3) **CANCELLED**  
SEC. 001 CRN 50322  
TEXT: 1) *An Introduction to Fluid Dynamics*; G.K. Batchelor; Cambridge Mathematical Library; February 28, 2000 Edition; ISBN 10:0521663962; ISBN 13:978-0521663960 2) *Fluid Mechanics*; J.H. Spark and N. Aksel; Springer Verlag 2008; 2<sup>nd</sup> Edition; ISBN 978-3-540-73536-6  
TIME: TBD  
PROFESSOR: Dr. Christian Parigger

Fluid physics, overview of fluid mechanics and associated computational techniques; general description of laminar and turbulent flows; subsonic, supersonic and hypersonic flows; continuum, transitional and free-molecular flows; pipe flow, nozzle flow and sonic orifice expansion flows; reacting and nonreacting flowfields; shock-tube physics; and introduction to method of characteristics and Monte Carlo computational techniques.

PHYS 506 Experimental Methods (3)  
SEC. 001 CRN 50321  
TEXT: None  
TIME: Tuesday & Friday 3:00 – 4:15 CLA Conference Room & Labs  
PROFESSOR: Dr. Lloyd Davis

Introduction to experimental methods of spectroscopy through hands on operation of FTIR, Raman, NMR, photoelectron, laser and mass spectrometers. Principles and hazards of cw and pulsed lasers, radiation detectors, photomultiplier tubes, image intensifiers, image converters; high-vacuum systems including cryogenic-based devices, data acquisition techniques including lock-in amplifiers, box-car integrators, digital electronics methods and micro-computer data acquisition.

Note: This course will cover the following topics with alternate classroom meetings and hands-on session in the labs: RC circuits, transmission lines, impedance matching, analog and digital oscilloscopes, signal acquisition and processing, feedback and PID controllers, curve fitting and analysis, LabView, NI-DAQ, FPGA and Realtime modules, Photon detectors; photomultipliers, photodiodes, spectrophotometer, spectrometer, autocorrelator, Frequency-Resolved Optical Gating (FROG), CCD, ICCD, and EM-CCDs, Streak and framing cameras; synchronization, optical microscopes, electron microscopes, Autocad and design, machine shop, Lock-in amplifiers, box-car average, Motion control; Temperature control, clean room, microfabrication, regenerative amplifier, femtosecond laser machining. Other topics may be added. The course will include homework assignments, and midterm and final practicals

PHYS 511 Theoretical Physics I (3) (Video Recorded)  
 SEC. 001 CRN 42382  
 TEXT: Theoretical Physics; Constant  
 TIME: Monday & Thursday 1:00 – 2:15 E-113  
 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 513 Problems in Theoretical Physics I (3) (Video Recorded)  
 SEC. 002 CRN 50737  
 TEXT: TBD  
 TIME: Wednesday 10:15 – 11:30 E-113  
 PROFESSOR: Dr. Marianne Breinig

Fundamentals of physics: classical mechanics (Newtonian mechanics, Lagrangian and Hamiltonian dynamics) and electrostatics and magnetostatics.

PHYS 521 Quantum Mechanics (3)  
 SEC. 002 CRN 48515  
 TEXT: [http://www.amazon.com/Modern-Quantum-Mechanics-2nd-Sakurai/dp/0805382917/ref=cm\\_cr\\_product\\_top#](http://www.amazon.com/Modern-Quantum-Mechanics-2nd-Sakurai/dp/0805382917/ref=cm_cr_product_top#)  
 TIME: Tuesday & Friday 1:00 – 2:15 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 42390  
 TEXT: *Classical Mechanics*; Goldstein; 2<sup>nd</sup> Edition  
 TIME: Monday & Thursday 10:45 – 12:00 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 42404  
TEXT: Arfken et al. 7<sup>th</sup> Edition; Arfken reference; [http://www.amazon.com/Mathematical-Methods-Physicists-Seventh-Comprehensive/dp/0123846544/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1328812143&sr=1-1](http://www.amazon.com/Mathematical-Methods-Physicists-Seventh-Comprehensive/dp/0123846544/ref=sr_1_1?s=books&ie=UTF8&qid=1328812143&sr=1-1)  
Boas 3<sup>rd</sup> Edition; Boas reference; [http://www.amazon.com/Mathematical-Methods-Physical-Sciences-Mary/dp/0471198269/ref=pd\\_vtp\\_b\\_1](http://www.amazon.com/Mathematical-Methods-Physical-Sciences-Mary/dp/0471198269/ref=pd_vtp_b_1)  
TIME: Monday & Thursday 2:30 – 3:45 E-111  
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 593 Independent Study (3)  
SEC. 004 CRN 50819  
TEXT: TBD  
TIME: TBD  
PROFESSOR: Dr. Horace Crater

Independent study course in aspects of quantum field theory and perturbation theory.  
Repeatability: May be repeated. Maximum 15 hours.

PHYS 599 Seminars (1)  
SEC. 005 CRN 42419  
TEXT: None  
TIME: 2<sup>nd</sup> & 4<sup>th</sup> Thursday 3:30 – 5:00 H-111  
PROFESSOR: Dr. Horace Crater

(a) Mechanics; (b) Radiation; (c) Heat and Thermodynamics; (d) Electricity and Magnetism;  
(e) Modern Physics.  
*Repeatability: May be repeated with consent of department. Maximum 18 hours.*

Physics seminars given by or chosen by students. (Note this course number will be 503 for students who have less than 6 credits in PHYS 503 - and 599 for those with more than 6 credits in PHYS 503.)

PHYS 600 Doctoral Research/Dissertation (3-15)  
SEC. 002 CRN 42424 Crater  
003 CRN 42425 Davis  
004 CRN 42426 Lewis  
005 CRN 42427 Parigger

PHYS 602 Atomic Physics (3)

SEC. 002 CRN 48516

TEXT: Theoretical Atomic Physics (primary course book reference for fall 2012) and a variety of selected sections from other books and current research literature; H.S. Freidrich; Springer Verlag; Corr. 2<sup>nd</sup> printing edition (March 1, 2004); ISBN 10:3540641246; ISBN 13:978-3540641247

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

PROFESSOR: Dr. Christian Parigger

Advanced problems.

*Comment(s): For students specializing in the field.*

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