

# *Summer 2013*

## *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)



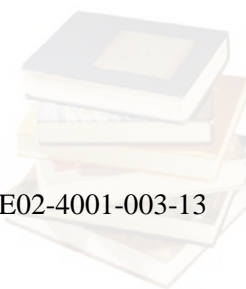
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## CALENDAR - 2013 SUMMER SEMESTER

Priority Registration.....	February 27 – May 28, 2013
Admission to Candidacy Forms for Summer 2013 Commencement.....	April 26, 2013
Summer 2013 Graduation Application Deadline .....	April 26, 2013
Memorial Day Holiday .....	May 27, 2013
<b>Late Registration and late fees.....</b>	<b>May 30 – June 7, 2013</b>
Classes begin.....	May 30, 2013
Last Day to Late Register, Add, Change Grading Options or Drop Without a “W” .....	June 7, 2013
Graduation Fee Payment Deadline (MS \$30, PhD \$75).....	April 26, 2013
Preliminary Thesis/Dissertation Review Deadline .....	June 21, 2013
Independence Day Holiday.....	July 4, 2013
No Classes.....	July 5, 2013
Last day to schedule final exam (thesis) .....	July 5, 2013
Last day to schedule final exam (non-thesis/capstone students).....	July 5, 2013
Last day to schedule final exam (dissertation).....	July 12, 2013
Drop with a “W” .....	July 19, 2013
Last day to take final exam (thesis/dissertation students).....	July 19, 2013
Last day to take final exam (non-thesis/capstone students).....	July 19, 2013
Electronic Thesis/Dissertation due in Knoxville (5:00 P.M. EST).....	August 2, 2013
Submit report of final examination (Pass/Fail) form .....	August 2, 2013
Deadline for Submission of Admission to Candidacy for students	
Graduating Fall 2013 and Graduation Application.....	August 9, 2013
Deadline for removing "INCOMPLETE" grades .....	August 9, 2013
Classes End.....	August 9, 2013
Exam Period (Exams are given during the regularly scheduled class meeting times.)	
Total Withdraw from the University Deadline .....	August 9, 2013
No Commencement Ceremony or Graduate Hooding – Graduation Date.....	August 10, 2013
Second thesis/dissertation deadline.....	August 20, 2013
Defense completed and Second Deadline Graduation Application submitted by August 9 <sup>th</sup>	
Student will receive diploma December 2013 but will not have to register for Fall 2013	

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## FALL SEMESTER 2013

Priority Registration.....	March 11 – August 19, 2013
Late Registration .....	August 21 – 30, 2013
Classes Begin.....	August 21, 2013
Labor Day Holiday .....	September 2, 2013
Fall Break.....	October 17 -18, 2013
Thanksgiving Break.....	November 28 – 29, 2013
Classes End.....	December 3, 2013
Study Period.....	December 4, 2013
Exam Period.....	December 5, 6, & 9, 2013
Graduate Hooding Ceremony (UTK) .....	December 12, 2013
Commencement (UTK) .....	December 13, 2013

**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](http://registrar.tennessee.edu/academic_calendar/index.shtml)

**SUMMER SEMESTER 2013**

**EXAM SCHEDULE**

LAST DAY OF CLASSES.....August 9, 2013

FINAL EXAMS FOR SUMMER ARE GIVEN DURING THE REGULARLY SCHEDULED CLASS MEETING TIMES.

**\*\*\*\* ATTENTION \*\*\*\***

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

## **REGISTRATION ANNOUNCEMENT SUMMER SEMESTER 2013**

### **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	May 15, 2013
Summer 2013 Fees Due for Priority Registered Student by 4:30 p.m. (EST)	May 28, 2013
Late Registration/Late Fees Begin	May, 30, 2013
Summer 2013 Late/Final Registration Fees Due by 4:30 p.m. (EST)	July 29, 2013

**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**

May 30 – June 5, 2013	\$20 Fee
June 6 – 12, 2013	\$40 Fee
June 13 – 19, 2013	\$60 Fee
June 20 – 26, 2013	\$80 Fee
June 27, 2013 – forward	\$100 Fee

## **CREDIT CARD PAYMENTS**

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

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

The Budget and Finance Office will generate a billing after the student has provided a letter of authorization from the third party sponsor. Authorization must include the sponsor's name and address as well as the maximum amount which will be paid for each specific term. The authorization can be mailed to UTSI Budget and Finance Office, MS#12, 411 B.H. Goethert Parkway, Tullahoma, TN 37388-9700 or email it to [jboyles@utsi.edu](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 May 30, 2013. 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 .....	60.00
Total .....	\$4,560.00

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

Maintenance Fee .....	\$4,500.00*
Programs and Services Fee .....	60.00
Tuition .....	\$9,094.00*
Total .....	\$13,654.00

**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 six semester hours or more for the semester are assessed an activity fee of \$60.00 per semester. Part-time students taking fewer than six 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):

<b>DROP DATE</b>	<b>CHARGE</b>	<b>REFUND</b>
May 30 – June 3, 2013	NO CHARGE	100%
June 4 – 9, 2013	20% CHARGE	80%
June 10 – 14, 2013	40% CHARGE	60%
June 15 – 19, 2013	60% CHARGE	40%
June 20, 2013 – End of Term	100% CHARGE	0%

## 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 **August 9, 2013**. 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 2012-2013 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**

Final exams for summer semester are given during the regularly scheduled class meeting time.

## **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  
Summer 2013 Course Listings**

**AEROSPACE ENGINEERING**

AE	500	Thesis (1-15)	
	002	CRN 82039	Abedi
	003	CRN 82040	Antar
	004	CRN 82041	Anusonti-Inthra
	005	CRN 82042	Flandro
	009	CRN 82046	Majdalani
	010	CRN 82047	Moeller
	011	CRN 82048	Solies
	013	CRN 82050	Steinhoff
	014	CRN 82051	Vakili
	015	CRN 82052	Zhang

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

*Credit Level Restriction: Graduate credit only.*

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

AE	502	Registration for Use of Facilities (1-15)	
SEC.	003	CRN 82054	Moeller

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

*Grading Restriction: Satisfactory/No Credit grading only.*

*Repeatability: May be repeated.*

*Credit Restriction: May not be used toward degree requirements.*

*Credit Level Restriction: Graduate credit only.*

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

AE	525	Hypersonic Flow (3)	
SEC.	001	CRN 83708	
TEXT:	<i>Hypersonic and High Temperature Gas Dynamics</i> ; John D. Anderson; American Institute of Aeronautics and Astronautics; 2 <sup>nd</sup> Edition		
TIME:	Tuesday & Friday	9:30 – 11:30	E-113
PROFESSOR:	Dr. Trevor Moeller		

Slender body flow; similitude; Newtonian theory; blunt body flow; viscous interactions; free molecule and rarefied gas flow.

*(DE) Prerequisite(s): 512*

AE 590 Selected Engineering Problems (3)  
 SEC. 001 CRN 82056 Abedi  
 002 CRN 82057 Antar  
 003 CRN 82058 Anusonti-Inthra  
 004 CRN 82365 Flandro  
 005 CRN 82366 Majdalani  
 006 CRN 82367 Moeller  
 007 CRN 82368 Solies  
 008 CRN 82369 Steinhoff  
 009 CRN 82370 Vakili  
 010 CRN 83693 Zhang

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

AE 599 Special Topics in AE: Combustion Instability of Gas Turbine Engines (3)  
 (Same as ME 599 002 CRN 83929)  
 SEC. 003 CRN 83298  
 TEXT: *Combustion Instabilities in Gas Turbine Engines*; T. Lieuwen and V. Yang; AIAA; 1<sup>st</sup> Edition;  
 ISBN 156347669X  
 TIME: Monday & Wednesday 1:00- 2:15 B-210  
 PROFESSOR: Dr. Joseph Majdalani

Combustion instability in gas turbines; designing for stability; passive control methods; flame dynamics in swirl injectors; vorticoacoustic flame interactions; acoustic analysis; stability prediction; active control.  
 Prereq: Fundamentals of Aeroacoustics, AE 562, or consent of instructor.

AE 600 Doctoral Research and Dissertation (3-15)  
 SEC. 002 CRN 82060 Abedi  
 003 CRN 82061 Antar  
 004 CRN 82062 Anusonti-Inthra  
 005 CRN 82063 Flandro  
 011 CRN 82069 Majdalani  
 012 CRN 82070 Moeller  
 013 CRN 82815 Solies  
 014 CRN 83674 Steinhoff  
 015 CRN 83675 Vakili  
 016 CRN 83676 Zhang

*Grading Restriction: P/NP only.*  
*Repeatability: May be repeated.*  
*Registration Restriction(s): Minimum student level – graduate.*

## AVIATION SYSTEMS

AVSY 500 Thesis (1-15)  
SEC. 001 CRN 81746 Martos  
002 CRN 81747 Pujol  
004 CRN 81749 Solies

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

*Credit Level Restriction: Graduate credit only.*

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

AVSY 502 Registration for Use of Facilities (1-15)  
SEC. 001 CRN 81767 Martos  
002 CRN 81768 Pujol  
004 CRN 81770 Solies

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

*Grading Restriction: Satisfactory/No Credit grading only.*

*Repeatability: May be repeated.*

*Credit Restriction: May not be used toward degree requirements.*

*Credit Level Restriction: Graduate credit only.*

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

AVSY 550 Project in Aviation Systems (3)  
SEC. 001 CRN 81772 Martos  
002 CRN 81773 Pujol  
004 CRN 81775 Solies

*Repeatability: May be repeated. Maximum 15 hours.*

*Credit Restriction: Maximum of 3 hours may be applied toward degree requirements.*

*Comment(s): Non-thesis aviation systems majors only.*

*Credit Level Restriction: Graduate credit only.*

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

## BIOMEDICAL ENGINEERING

BME 500 Thesis (1-15)  
SEC. 010 CRN 83321 Johnson

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

*Credit Level Restriction: Graduate credit only.*

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



BME 529 Applications of Linear Algebra in Engineering Systems (3)  
SEC. 001 CRN 82087  
TEXT: *Advanced Linear Algebra for Engineers with MATLAB*; Sohail A. Dianat and Eli S. Saber;  
CRC Press; Latest Edition; ISBN 978-1-4200-9523-4  
TIME: Tuesday, Thursday & Friday 10:00 – 11:15 E-111  
PROFESSOR: Dr. Monty Smith

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

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion. Vector spaces: spanning sets, orthogonality, matrix decompositions, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

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

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

BME 599 Special Topics in Biomedical Engineering: Data Interpretation for Engineers II (3)  
SEC. 002 CRN 83706  
TEXT: *Mathematical Methods for Science Students*; G. Stephenson; Longman Scientific and Technical;  
2<sup>nd</sup> Edition; ISBN 0-582-44416-0  
TIME: Tuesday & Thursday 10:45 – 12:45 E-110  
PROFESSOR: Dr. Jacqueline Johnson

Mathematics review (interpolation, extrapolation, differentiation, integration and normalization). Signal Processing (FFT and IFFT, STFT, convolution, correlation, smoothing, filtering, wavelets).

Each student will require a computer and access to Origin Software.

BME 600 Doctoral Research and Dissertation (3-15)  
SEC. 009 CRN 83322 Johnson

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

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

## CHEMICAL AND BIOMOLECULAR

CBE 529 Applications of Linear Algebra in Engineering Systems (3)  
SEC. 001 CRN 82108  
TEXT: *Advanced Linear Algebra for Engineers with MATLAB*; Sohail A. Dianat and Eli S. Saber;  
CRC Press; Latest Edition; ISBN 978-1-4200-9523-4  
TIME: Tuesday, Thursday & Friday 10:00 – 11:15 E-111  
PROFESSOR: Dr. Monty Smith

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

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion. Vector spaces: spanning sets, orthogonality, matrix decompositions, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

*Cross-listed: (Same as Biomedical Engineering 529; Electrical and Computer Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529.)*  
*Comment(s): Graduate standing or consent of instructor required.*

## COMPUTER SCIENCE

CS 572 Numerical Mathematics II (3)  
SEC. 001 CRN 83704  
TEXT: (1) *Numerical Mathematics*; A. Quarteroni, R. Sacco, F. Saleri; Springer; 2nd Edition; ISBN-10:3540346589 ISBN-13:978-3540346586 (2) *A First Course in Computational Physics*; P.L. DeVries, J.E. Hasbun; and selected lecture notes including Matlab introductory notes; Jones and Bartlett; 2nd Edition; ISBN 978-0-7637-7314-4  
TIME: Monday & Wednesday 10:00 – 12:00 E-111  
PROFESSOR: Dr. Christian Parigger

Numerical techniques for initial value problems of ordinary differential equations. Two-point boundary value problems. Finite difference and finite element methods for selected partial differential equations. Fast Poisson solvers.

*Cross-listed: (Math 572.)*

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

Students wishing to count this course toward IGMCS should enroll under Math 572, since IGMCS will count it as a Math course only.

Comments: Part II of a trilogy, part 1 was NumMathI, part 3 is PDE methods.

(A) Summer 2012: CS571/MATH571 Numerical Mathematics I: *Direct and iterative methods for linear systems. The algebraic eigenvalue problem and the singular decomposition theorem. Newton and quasi-Newton methods for systems of nonlinear equations. Cross-listed: (Same as Computer Science 571.)*

(B) Summer 2014: MATH578 Numerical Methods for Partial Differential Equations: *Numerical approximation of solutions of partial differential equations including conservation laws and hyperbolic, parabolic, and elliptic problems. Derivation, physical meaning, and implementation of schemata.*

## **ELECTRICAL ENGINEERING AND COMPUTER SCIENCE**

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

SEC. 001 CRN 82296

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

TIME: Tuesday, Thursday & Friday 10:00 – 11:15 E-111

PROFESSOR: Dr. Monty Smith

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

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion. Vector spaces: spanning sets, orthogonality, matrix decompositions, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

*Cross-listed: (Same as Biomedical Engineering 529; Chemical and Biomolecular Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529.)*

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

ECE 600 Doctoral Research and Dissertation (3-15)

SEC. 028 CRN 82327 Bomar

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

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

## **ENGINEERING MANAGEMENT**

EM 501 Capstone Project (3-6)

SEC. 001 CRN 80004 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 502 Registration for Use of Facilities (1-15)  
SEC. 001 CRN 80005 Simonton

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

*Grading Restriction: Satisfactory/No Credit grading only.*

*Repeatability: May be repeated.*

*Credit Restriction: May not be used toward degree requirements.*

*Credit Level Restriction: Graduate credit only.*

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

EM 536 Project Management (3) (Video Recorded)  
SEC. 001 CRN 80006 UTSI students participating at Tullahoma or Oak Ridge  
002 CRN 80007 UTSI students participating elsewhere  
003 CRN 80008 UTK students participating at Knoxville DE classrooms  
004 CRN 80009 UTK students participating elsewhere

TEXT: *A Managerial Approach*; J. Meredith, S. Mantel, Jr. .8th edition;  
ISBN-13:978-0-470-53302-4

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

PROFESSOR: Dr. James Simonton

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

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

EM 542 Design of Experiments for Engineering Managers (3) (Video Recorded)  
SEC. 001 CRN 80010 UTSI students participating at Tullahoma or Oak Ridge  
002 CRN 80011 UTSI students participating elsewhere  
003 CRN 80012 UTK students participating at Knoxville DE classrooms  
004 CRN 80013 UTK students participating elsewhere

TEXT: *Principles of Experimental Design and Analysis*; Alberto Garcia-Diaz & Don T. Phillips;  
Chapman & Hall; 1995. This book is out of print but instructor will provide copies  
of the textbook through Blackboard

TIME: Tuesday & Thursday 1:00 – 3:00 E-111

PROFESSOR: Dr. Alberto Garcia

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

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

EM 600 Doctoral Research and Dissertation (3-15)  
SEC. 002 CRN 82672 Simonton

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

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

## INDUSTRIAL ENGINEERING

IE 529 Applications of Linear Algebra in Engineering Systems (3)  
SEC. 001 CRN 80122  
TEXT: *Advanced Linear Algebra for Engineers with MATLAB*; Sohail A. Dianat and Eli S. Saber;  
CRC Press; Latest Edition; ISBN 978-1-4200-9523-4  
TIME: Tuesday, Thursday & Friday 10:00 – 11:15 E-111  
PROFESSOR: Dr. Monty Smith

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

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion. Vector spaces: spanning sets, orthogonality, matrix decompositions, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

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

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

## MATERIALS SCIENCE AND ENGINEERING

MSE 529 Applications of Linear Algebra in Engineering Systems (3)  
SEC. 001 CRN 80172  
TEXT: *Advanced Linear Algebra for Engineers with MATLAB*; Sohail A. Dianat and Eli S. Saber;  
CRC Press; Latest Edition; ISBN 978-1-4200-9523-4  
TIME: Tuesday, Thursday & Friday 10:00 – 11:15 E-111  
PROFESSOR: Dr. Monty Smith

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

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion. Vector spaces: spanning sets, orthogonality, matrix decompositions, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

*Cross-listed: (Same as Biomedical Engineering 529; Chemical and Biomolecular Engineering 529; Electrical and Computer Engineering 529; Industrial Engineering 529; Mechanical Engineering 529.)*

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

## MATHEMATICS

MATH 443 Complex Variables (3)  
SEC. 001 CRN 81278  
TEXT: *Complex Variables*; Spiegel; Schaum's Outline McGraw Hill  
TIME: Monday & Thursday 1:00 – 3:00 E-113  
PROFESSOR: Dr. Horace Crater

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

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

MATH 572 Numerical Mathematics II (3)  
SEC. 001 CRN 83705  
TEXT: (1) *Numerical Mathematics*; A. Quarteroni, R. Sacco, F. Saleri; Springer; 2nd Edition; ISBN-10:3540346589 ISBN-13:978-3540346586 (2) *A First Course in Computational Physics*; P.L. DeVries, J.E. Hasbun; and selected lecture notes including Matlab introductory notes; Jones and Bartlett; 2nd Edition; ISBN 978-0-7637-7314-4  
TIME: Monday & Wednesday 10:00 – 12:00 E-111  
PROFESSOR: Dr. Christian Parigger

Numerical techniques for initial value problems of ordinary differential equations. Two-point boundary value problems. Finite difference and finite element methods for selected partial differential equations. Fast Poisson solvers.

*Cross-listed: (CS 572.)*

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

Students wishing to count this course toward IGMCS should enroll under Math 572, since IGMCS will count it as a Math course only.

Comments: Part II of a trilogy, part 1 was NumMathI, part 3 is PDE methods.

(A) Summer 2012: CS571/MATH571 Numerical Mathematics I: *Direct and iterative methods for linear systems. The algebraic eigenvalue problem and the singular decomposition theorem. Newton and quasi-Newton methods for systems of nonlinear equations. Cross-listed: (Same as Computer Science 571.)*

(B) Summer 2014: MATH578 Numerical Methods for Partial Differential Equations: *Numerical approximation of solutions of partial differential equations including conservation laws and hyperbolic, parabolic, and elliptic problems. Derivation, physical meaning, and implementation of schemata.*

## MECHANICAL ENGINEERING

ME	500	Thesis (1-15)	
SEC.	002	CRN 80204	Abedi
	004	CRN 80205	Antar
	023	CRN 80230	Anusonti-Inthra
	024	CRN 80231	Flandro
	027	CRN 80234	Majdalani
	028	CRN 80235	Moeller
	029	CRN 82457	Solies
	030	CRN 82458	Steinhoff
	031	CRN 83678	Vakili
	032	CRN 83679	Zhang

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

*Credit Level Restriction: Graduate credit only.*

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

ME	502	Registration for Use of Facilities (1-15)	
SEC.	002	CRN 80237	Moeller

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

*Grading Restriction: Satisfactory/No Credit grading only.*

*Repeatability: May be repeated.*

*Credit Restriction: May not be used toward degree requirements.*

*Credit Level Restriction: Graduate credit only.*

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

ME	529	Applications of Linear Algebra in Engineering Systems (3)		
SEC.	001	CRN	80239	
TEXT:	<i>Advanced Linear Algebra for Engineers with MATLAB</i> ; Sohail A. Dianat and Eli S. Saber; CRC Press; Latest Edition; ISBN 978-1-4200-9523-4			
TIME:	Tuesday, Thursday & Friday	10:00 – 11:15	E-111	
PROFESSOR:	Dr. Monty Smith			

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

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion. Vector spaces: spanning sets, orthogonality, matrix decompositions, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

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

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

ME	590	Selected Engineering Problems (3)	
SEC.	001	CRN 80253	Abedi
	002	CRN 80254	Antar
	003	CRN 80255	Anusonti-Inthra
	004	CRN 82618	Flandro
	005	CRN 82619	Majdalani
	006	CRN 82620	Moeller
	007	CRN 82621	Solies
	008	CRN 82622	Steinhoff
	010	CRN 82781	Vakili
	009	CRN 82623	Zhang

*Grading Restriction: Satisfactory/No Credit grading only.*

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

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

*Registration Permission: Consent of advisor.*

ME 599 Special Topics in AE: Combustion Instability of Gas Turbine Engines (3)  
(Same as AE 599 003 CRN 83298)

SEC. 002 CRN 83929

TEXT: *Combustion Instabilities in Gas Turbine Engines*; T. Lieuwen and V. Yang; AIAA; 1<sup>st</sup> Edition; ISBN 156347669X

TIME: Monday & Wednesday

1:00 – 2:15

B-210

PROFESSOR: Dr. Joseph Majdalani

Combustion instability in gas turbines; designing for stability; passive control methods; flame dynamics in swirl injectors; vorticoacoustic flame interactions; acoustic analysis; stability prediction; active control.

Prereq: Fundamentals of Aeroacoustics, AE 562, or consent of instructor

ME	600	Doctoral Research and Dissertation (3-15)	
SEC.	002	CRN 80264	Abedi
	003	CRN 80265	Antar
	004	CRN 80266	Anusonti-Inthra
	005	CRN 80267	Flandro
	020	CRN 80282	Majdalani
	025	CRN 80288	Moeller
	026	CRN 83263	Solies
	028	CRN 83681	Steinhoff
	029	CRN 83682	Vakili
	030	CRN 83683	Zhang



All phases of mechanical engineering, reports on current research at the University of Tennessee, Knoxville, and the University of Tennessee Space Institute.

*Grading Restriction: Satisfactory/No Credit grading only.*

*Repeatability: May be repeated. Maximum 20 hours.*

## PHYSICS

PHYS 500 Thesis (1-15)  
SEC. 001 CRN 81467 Chen  
003 CRN 81469 Crater  
004 CRN 81470 Davis  
005 CRN 81471 Parigger

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

*Credit Level Restriction: Graduate credit only.*

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

PHYS 502 Registration for Use of Facilities (1-15)  
SEC. 002 CRN 82776 Davis

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

*Grading Restriction: Satisfactory/No Credit grading only.*

*Repeatability: May be repeated.*

*Credit Restriction: May not be used toward degree requirements.*

*Credit Level Restriction: Graduate credit only.*

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

PHYS 593 Independent Study (Modern Physics) (3)  
SEC. 001 CRN 81477  
TEXT: *Modern Physics*; Anderson  
TIME: Monday & Thursday 10:00 – 12:00 E-113  
PROFESSOR: Dr. Horace Crater

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

*Repeatability: May be repeated. Maximum 15 hours.*

PHYS 600 Doctoral Research and Dissertation (3-15)  
SEC. 001 CRN 81480 Chen  
003 CRN 81482 Crater  
004 CRN 81483 Davis  
005 CRN 81484 Parigger

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

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