

# Summer 2017 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)**

 **SPACE INSTITUTE**

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## CALENDAR - SUMMER SEMESTER 2017

Priority Registration.....	March 1, 2017
Admission to Candidacy Forms for Summer 2017 Commencement.....	April 28, 2017
Summer 2017 Graduation Application Deadline submit online at MyUTK .....	April 28, 2017
Graduation Fee Payment Deadline (MS \$30, PhD \$75).....	April 28, 2017
Memorial Day Holiday .....	May 29, 2017
<b>Late Registration and late fees (\$100 Late Fee) .....</b>	<b>June 1, 2017</b>
Classes begin.....	June 1, 2017
Last Day to Final Register, Add, Change Grading Options or Drop Without a “W” ....	June 9, 2017
<b>Late Registration and late fees after 14<sup>th</sup> day (\$200 Late Fee).....</b>	<b>June 15, 2017</b>
Preliminary Thesis/Dissertation Review Deadline .....	June 15, 2017
Independence Day Holiday.....	July 4, 2017
Last day to schedule final exam (non-thesis/thesis/dissertation students) .....	July 6, 2017
Last day to take final exam (non-thesis/thesis/dissertation students) .....	July 13, 2017
Drop with a “W” .....	July 21, 2017
Electronic Thesis/Dissertation to TRACE (5:00 P.M. EST).....	July 27, 2017
Submit report of final examination (Pass/Fail) form .....	July 27, 2017
Deadline for Submission of Admission to Candidacy for students	
Graduating Fall 2017 and Graduation Application.....	August 11, 2017
Deadline for removing "INCOMPLETE" grades .....	August 11, 2017
Classes End.....	August 11, 2017
Exam Period (Exams are given during the regularly scheduled class meeting times.)	
Total Withdraw from the University Deadline .....	August 11, 2017
No Commencement Ceremony or Graduate Hooding – Graduation Date.....	August 12, 2017
Second thesis/dissertation deadlines	
Defense Completed by August 11, 2017	
Second Deadline Application Submitted by August 11, 2017	
<a href="http://gradschool.utk.edu/forms/Second%20Deadline%20Graduation%20Application.pdf">http://gradschool.utk.edu/forms/Second%20Deadline%20Graduation%20Application.pdf</a>	
and submit a new graduation application for Fall graduation	
Thesis/Dissertation Submission Deadline by August 17, 2017	
(Student will receive diploma fall 2017 semester, but will not be required to register for thesis/dissertation credits)	

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## FALL SEMESTER 2017

Priority Registration.....	March 20, 2017
Late Registration .....	August 27, 2017
Classes Begin.....	August 23, 2017
Labor Day Holiday .....	September 4, 2017
Fall Break.....	October 5 - 6, 2017
Thanksgiving Break.....	November 23 – 24, 2017
Classes End.....	December 5, 2017
Study Period.....	December 6, 2017
Exam Period.....	December 7, 8 & 11, 2017
Graduate Hooding Ceremony (UTK) .....	December 14, 2017
Commencement (UTK) .....	December 15, 2017
Official Graduation Date.....	December 16, 2017

**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 2017**

**EXAM SCHEDULE**

LAST DAY OF CLASSES.....August 11, 2017

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 SPRING SEMESTER 2017

### REGISTRATION PROCEDURE

#### GRADUATE ACADEMIC ADVISING

Graduate students should contact your departmental faculty to arrange an advising appointment. If you're not accepted into a specific program, the assistant to the dean of graduate studies or the designee may act as your advisor. When the web registration system asks if you've discussed your program with your advisor, you must answer yes to continue with the registration process.

#### 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://onestop.utk.edu/your-classes/registering-for-classes/>.

\*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 Registration 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).

#### 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)-37234  
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 should be completed online at <https://www.applyweb.com/utg> and must be accompanied by a \$60.00 non-refundable

application fee, payable to The University of Tennessee Space Institute. All applicants are required to provide one official transcript of all undergraduate and graduate records, GRE test scores and 3 letters of recommendation when applying. International applicants will also need to include TOEFL scores. Please select UT Space Institute if your plans are to attend the Tullahoma campus location. Only online applications will be accepted by Graduate Admissions Knoxville, TN.

Graduate Research Assistantship applications can be sent to Clara Ferguson, Office of Admissions and Recruiting, University of Tennessee Space Institute, MS-6, Tullahoma, TN 37388-9700. All applications should be accompanied by undergraduate and graduate transcripts and GRE test scores are required for all departments. All International applicants will need to provide TOEFL test scores in addition to GRE's. All official transcripts and test scores should be sent to College Code 1843, Graduate Admissions Office, 201 Student Services Building, Knoxville, TN 37996-0221. A full admission will not be granted by Graduate Admissions until all official test scores and degree confirmation are received. Please contact Clara Ferguson at (931) 393-7234 or 888-822-8874 ext. 37234 if you have questions.

### **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/Summer semesters are considered full-time. Full-time enrollment for two consecutive semesters is required to full fill the admission to candidacy doctoral degree residency requirement. Graduate Research Assistants (GRAs) must be enrolled for 9 hours during the Fall/Spring semesters and 6 hours during the Summer. GRAs must also enroll in one of the MABE 595 seminars or a PHYS 599 seminar each semester in which seminars are offered, 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 Spring Semester 2017 must remove all INCOMPLETE GRADES by August 11, 2017. 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 ENROLLMENT**

All degree-seeking graduate students are expected to make a full commitment to their graduate and professional study in order to ensure that they can complete all degree requirements without unnecessary delay. Graduate students are therefore required to maintain an active status through continuous enrollment from the time of first enrollment until graduation.

Continuous enrollment is maintained by registering for a minimum of one graduate credit hour per semester (excluding the summer, unless stipulated otherwise by the program or department). However, students who have started taking dissertation hours (course 600) must maintain a minimum of three credit hours per semester during all semesters, including the summer, as stipulated in the policy on "Registration for Course 600 (Doctoral Research and Dissertation)" in order to comply with the Continuous Enrollment requirement (see under Doctoral Programs for details).

The minimum enrollment for international students may be different, and international students always need to check with the Center for International Education (CIE) in order to determine what minimum enrollment they need to maintain in order to satisfy all enrollment requirements attached to their specific visa.

## **CONSEQUENCES OF NON-ENROLLMENT WITHOUT LEAVE OF ABSENCE**

Graduate students who do not maintain continuous enrollment as stipulated in the "Continuous Enrollment" policy will lose their active student status. A student who has lost his or her active status without having been granted a Leave of Absence for the period of non-enrollment ahead of time will not be allowed to continue in his her graduate program until readmitted. (see policy on "Readmission" in the Graduate Catalog for more details).

Non-enrollment other than during an approved Leave of Absence (LOA) does not alter or affect any of the milestone deadlines, such as admission to candidacy, time to degree, etc.

Upon approval for readmission to complete the interrupted degree program, students will be retroactively enrolled in every semester of missed enrollment for one graduate credit hour of Course 502 or for three graduate credit hours of Course 600 (whichever is appropriate). Students will be responsible for paying the past tuition charges and fees as well as the current university per semester late registration penalty. All past due charges will need to be paid before the Graduate School will approve the student for any future enrollment.

## **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 2016-2017 academic year is provided by United HealthCare Student Resources. The premium must be paid before registration. Contact the Student Services Office (room D-100 ext. 37228) 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.

## **FINANCIAL CALENDAR, FEES, REFUNDS, AND TUITION**

Please click <http://onestop.utk.edu/tuition-fees/> link to the most current information. You may also contact Jennifer Boyles in the Business and Finance Office at [jboyles@utsi.edu](mailto:jboyles@utsi.edu) or phone number 931-393-7297.



The UTSI Budget and Finance Accounts Receivable Office will no longer accept payment for tuition and fees by credit card. All students will need to login to MyUTK One Stop to make secure payments online.

Please see One Stop - Paying Tuition and Fees webpage for more details  
<http://onestop.utk.edu/pay/> .

#### Credit or Debit Cards

There is a 2.75% service fee for these payments. UT has a contract with an outside vendor to provide this service. The vendor retains the fee in full.

#### **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 online at <http://hilltopics.utk.edu/index.html>

**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 1988 (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 2017 Course Listings**

**AEROSPACE ENGINEERING**

AE	500	Thesis (1-15)	
	002	CRN 81673	Abedi
	003	CRN 81674	Brooks
	004	CRN 81675	Majdalani
	005	CRN 81676	Moeller
	009	CRN 81680	Schmisseur
	010	CRN 81681	Solies
	011	CRN 81682	Vakili
	013	CRN 81684	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 81688	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	590	Selected Engineering Problems (2-6)	
SEC.	001	CRN 81689	Abedi
	002	CRN 81690	Brooks
	003	CRN 81691	Majdalani
	004	CRN 81961	Moeller
	005	CRN 81962	Schmisseur
	006	CRN 81963	Solies
	007	CRN 81964	Vakili
	008	CRN 81965	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: Engineering Optics (Same as ME 599 002 CRN 82998) (3)  
 SEC. 003 CRN 82575  
 TEXT: *Springer Handbook of Lasers and Optics* (Available Free Online via UTK Libraries); Frank Träger;  
 Springer; 1<sup>st</sup> Edition; ISBN 978-0-387-95579-7  
 TIME: Tuesday & Thursday 3:00 – 5:00 E-111  
 PROF: Dr. Christopher Combs and Dr. Lloyd Davis

Introduction to basic principles of optics for engineers, with a focus on relevant engineering applications. Topics will include principles of light, geometric optics, photodetectors, lasers, design of optical experiments, and modern optical diagnostics (for example, shadowgraph, Schlieren, pressure-sensitive paint, laser-induced fluorescence, particle image velocimetry, etc.). The course will consist primarily of a lecture format, but will be supplemented with in-class laboratory demonstrations and exercises as well as reviews of current journal articles.

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

AE 600 Doctoral Research and Dissertation (3-15)  
 SEC. 002 CRN 81693 Abedi  
 003 CRN 81694 Brooks  
 004 CRN 81695 Majdalani  
 005 CRN 81696 Moeller  
 011 CRN 81702 Schmisser  
 012 CRN 81703 Solies  
 013 CRN 82256 Vakili  
 014 CRN 82809 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 81454 Brooks  
 002 CRN 81455 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 81474 Brooks  
 002 CRN 81475 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 81478 Brooks  
002 CRN 81479 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 82591 Johnson

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

BME 502 Registration for Use of Facilities (1-15)  
SEC. 002 CRN 84117 Johnson

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.*

BME 529 Applications of Linear Algebra in Engineering Systems (3)  
SEC. 001 CRN 81719 (Video Recorded)  
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: Monday, Wednesday & Friday 9:30 – 10:45 E-113  
PROF: 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; Civil Engineering 529, Electrical and Computer Engineering 529; Environmental Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529; Nuclear Engineering 529).*

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

BME 590 Selected Engineering Problems (2-6)  
SEC. 001 CRN 84697 Johnson

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

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

*Comment(s): Enrollment is limited to students in the non-thesis option.*

*Credit Level Restriction: Graduate credit only.*

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

*Registration Permission: Consent of instructor.*

BME 600 Doctoral Research and Dissertation (3-15)  
SEC. 009 CRN 82592 Johnson

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

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

## **ENGINEERING MANAGEMENT**

EM 502 Registration for Use of Facilities (1-15)  
SEC. 001 CRN 80004 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)  
SEC. 001 CRN 80005 UTSI students participating at Tullahoma  
002 CRN 80006 UTSI students participating elsewhere  
003 CRN 80007 UTK students participating elsewhere

TEXT: *Project Management: A Managerial Approach*; Jack R. Meredith, Samuel J. Mantel, Jr.; John Wiley & Sons, Inc.; 8<sup>th</sup> Edition; ISBN 978-0-470-53302-4

TIME: Tuesday & Thursday 1:00 - 3:30 E-113

PROF: 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.

*Recommended Background: Graduate standing in Engineering or Business.*

EM 600 Doctoral Research and Dissertation (3-15)  
SEC. 002 CRN 82161 Simonton  
004 CRN 83746 Yu

*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 80105 (Video Recorded)  
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: Monday, Wednesday & Friday 9:30 – 10:45 E-113  
PROF: 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; Biomedical Engineering 529; Civil Engineering 529, Electrical and Computer Engineering 529; Environmental Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529; Nuclear Engineering 529).*

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

## **MECHANICAL ENGINEERING**

ME 500 Thesis (1-15)  
SEC. 002 CRN 80181 Abedi  
004 CRN 80182 Brooks  
023 CRN 80207 Majdalani

024	CRN 80208	Moeller
027	CRN 80211	Schmisser
028	CRN 80212	Solies
029	CRN 82015	Vakili
030	CRN 82016	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 80214 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 80216 (Video Recorded)

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: Monday, Wednesday & Friday 9:30 – 10:45 E-113

PROF: 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; Biomedical Engineering 529; Civil Engineering 529; Electrical and Computer Engineering 529; Environmental Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Nuclear Engineering 529).*

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

ME 590 Selected Engineering Problems (2-6)

SEC. 001 CRN 80229 Abedi

002 CRN 80230 Brooks

003 CRN 80231 Majdalani

004	CRN 82117	Moeller
005	CRN 82118	Schmisser
006	CRN 82119	Solies
007	CRN 82120	Vakili
008	CRN 82121	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 ME: Engineering Optics (Same as AE 599 003 CRN 82575) (3)
SEC.	002	CRN 82998
TEXT:	<i>Springer Handbook of Lasers and Optics</i> (Available Free Online via UTK Libraries); Frank Träger; Springer; 1 <sup>st</sup> Edition; ISBN 978-0-387-95579-7	
TIME:	Tuesday & Thursday	3:00 – 5:00 E-111
PROF:	Dr. Christopher Combs and Dr. Lloyd Davis	

Introduction to basic principles of optics for engineers, with a focus on relevant engineering applications. Topics will include principles of light, geometric optics, photodetectors, lasers, design of optical experiments, and modern optical diagnostics (for example, shadowgraph, Schlieren, pressure-sensitive paint, laser-induced fluorescence, particle image velocimetry, etc.). The course will consist primarily of a lecture format, but will be supplemented with in-class laboratory demonstrations and exercises as well as reviews of current journal articles.

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

*Registration Permission: Consent of instructor.*

ME	600	Doctoral Research and Dissertation (3-15)
SEC.	002	CRN 80240 Abedi
	003	CRN 80241 Brooks
	004	CRN 80242 Majdalani
	005	CRN 80243 Moeller
	020	CRN 80258 Schmisser
	025	CRN 80264 Solies
	026	CRN 82546 Vakili
	028	CRN 82815 Zhang

*Grading Restriction: P/NP only.*

*Repeatability: May be repeated.*

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

## PHYSICS

Phys	500	Thesis (1-15)
SEC.	001	CRN 81225 Davis
	003	CRN 81227 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 82224 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 600 Doctoral Research and Dissertation (3-15)  
SEC. 001 CRN 81237 Davis  
003 CRN 81239 Parigger

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