

Summer 2014 Course Announcement

The University of Tennessee
Space Institute



411 B. H. Goethert Parkway
Tullahoma, TN 37388-9700
888-822-8874 x 228
www.utsi.edu

Summer 2014 Course Announcement

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CALENDAR - SUMMER SEMESTER 2014

Priority Registration.....	February 26 – May 27, 2014
Admission to Candidacy Forms for Summer 2014 Commencement.....	April 25, 2014
Summer 2014 Graduation Application Deadline submit online at MyUTK	April 25, 2014
Graduation Fee Payment Deadline (MS \$30, PhD \$75).....	April 25, 2014
Late Registration and late fees.....	May 29 – June 6, 2014
Classes begin.....	May 29, 2014
Last Day to Late Register, Add, Change Grading Options or Drop Without a “W”	June 6, 2014
Preliminary Thesis/Dissertation Review Deadline	June 20, 2014
Independence Day Holiday.....	July 4, 2014
Last day to schedule final exam non-thesis	July 3, 2014
Last day to schedule final exam thesis.....	July 3, 2014
Last day to schedule final exam dissertation	July 11, 2014
Last day to take final exam (non-thesis/thesis/dissertation students)	July 18, 2014
Drop with a “W”	July 18, 2014
Electronic Thesis/Dissertation due in Knoxville (5:00 P.M. EST).....	August 1, 2014
Submit report of final examination (Pass/Fail) form	August 1, 2014
Deadline for Submission of Admission to Candidacy for students Graduating Fall 2014 and Graduation Application.....	August 8, 2014
Deadline for removing "INCOMPLETE" grades	August 8, 2014
Classes End.....	August 8, 2014
Exam Period (Exams are given during the regularly scheduled class meeting times.)	
Total Withdraw from the University Deadline	August 8, 2014
No Commencement Ceremony or Graduate Hooding – Graduation Date.....	August 9, 2014
Second thesis/dissertation deadlines	
Defense Completed by August 8, 2014	
Second Deadline Application Submitted by August 8, 2014	
http://gradschool.utk.edu/forms/Second%20Deadline%20Graduation%20Application.pdf	
and submit a new graduation application for Fall graduation	
Thesis/Dissertation Submission Deadline by August 19, 2014	
(Student will receive diploma fall 2014 semester, but will not be required to register for thesis/dissertation credits)	

FALL SEMESTER 2014

Priority Registration.....	March 10, 2014
Late Registration	August 20 – 29, 2014
Classes Begin.....	August 20, 2014
Labor Day Holiday	September 1, 2014
Fall Break.....	October 16 -17, 2014
Thanksgiving Break.....	November 27 – 28, 2014
Classes End.....	December 2, 2014
Study Period.....	December 3, 2014
Exam Period.....	December 4, 5, & 8, 2014
Graduate Hooding Ceremony (UTK)	December 12, 2014
Commencement (UTK)	December 13, 2014
Official Graduation Date.....	December 13, 2014

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

SUMMER SEMESTER 2014

EXAM SCHEDULE

LAST DAY OF CLASSES August 8, 2014

**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 2014

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.

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 should be completed online at <http://admissions.utk.edu/graduate/apply.shtml> 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 scores and 3 letters of recommendation when applying. International applicants

will also need to include TOEFL scores. Please select UT Space Institute as your location for the Tullahoma location. Only online applications will be accepted by Graduate Admission Knoxville, TN.

Graduate Research Assistantships can be sent to the UTSI Admissions Office, MS-1, Tullahoma, TN 37388-9700. All applications should be accompanied by Undergraduate and Graduate transcripts, GRE and TOEFL (if international applicant) and 3 letters of recommendation (copies will suffice). All official transcripts and test scores should be sent to College Code 1843. A full admission will not be granted by Graduate Admissions until all official test scores and degree confirmation is received. Please contact Dee Merriman, Associate Director, at (931) 393-7213 or 888-822-UTSI 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 semesters or 6 hours in the Summer term are considered full-time students. Research Assistants must be full-time students and also enroll in one of the MABE 595 seminars or a PHYS 599 seminar each term, unless a waiver is granted by the Associate Executive Director.

REMOVAL OF INCOMPLETE GRADES

All Incomplete Grades (I) must be removed prior to graduation. The instructor, in consultation with the student, decides the terms for the removal of the I, including the time limit for removal. If the I is not removed within one calendar year, the grade will be changed to an F. The course will not be counted in the cumulative grade point average until a final grade is assigned. No student may graduate with an I on the record. Students planning to graduate Summer Semester 2014 must remove all INCOMPLETE GRADES by **August 8, 2014**. 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) 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 2013-2014 academic year is provided by United HealthCare Student Resources. 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.

FINANCIAL CALENDAR, FEES, REFUNDS, AND TUITION

Please click [FEES](#) link to the most current information. You may also contact Jennifer Boyles in the Business and Finance Office at jboyles@utsi.edu or phone number 931-393-7297.

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/hilltopics/>.

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 2014 Course Listings**

AEROSPACE ENGINEERING

AE	500	Thesis (1-15)		
	002	CRN 81952	Abedi	
	003	CRN 81953	Antar	
	004	CRN 81954	Anusonti-Inthra	
	005	CRN 81955	Flandro	
	009	CRN 81959	Majdalani	
	010	CRN 81960	Moeller	
	011	CRN 81961	Solies	
	014	CRN 81964	Vakili	
	015	CRN 81965	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 81967	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 83451		
TEXT:	<i>Hypersonic and High Temperature Gas Dynamics</i> ; John D. Anderson; American Institute of Aeronautics and Astronautics; 2 nd Edition			
TIME:	Tuesday & Friday	9:30 – 11:30		E-111
PROF:	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 (2-6)		
SEC.	001	CRN 81968	Abedi	
	002	CRN 81969	Antar	

003	CRN 81970	Anusonti-Inthra
004	CRN 82271	Flandro
005	CRN 82272	Majdalani
006	CRN 82273	Moeller
007	CRN 82274	Solies
009	CRN 82276	Vakili
010	CRN 83436	Zhang

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

AE	600	Doctoral Research and Dissertation (3-15)
SEC.	002	CRN 81972 Abedi
	003	CRN 81973 Antar
	004	CRN 81974 Anusonti-Inthra
	005	CRN 81975 Flandro
	011	CRN 81981 Majdalani
	012	CRN 81982 Moeller
	013	CRN 82671 Solies
	015	CRN 83418 Vakili
	016	CRN 83419 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 81672 Martos
	004	CRN 81675 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 81692 Martos
	004	CRN 81695 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 81696 Martos
004 CRN 81699 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 83109 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 81998

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 10:00 – 11:15 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 600 Doctoral Research and Dissertation (3-15)
SEC. 009 CRN 83110 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 82019
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 10:00 – 11:15 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 Biomedical 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.

CIVIL ENGINEERING

CE 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 001 CRN 83883
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 10:00 – 11:15 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; 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.

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

ECE 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 001 CRN 82204
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 10:00 – 11:15 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; 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.

ECE 600 Doctoral Research and Dissertation (3-15)
SEC. 028 CRN 82234 Bomar

Grading Restriction: P/NP only.

Repeatability: May be repeated.

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

ENGINEERING MANAGEMENT

EM 500 500 Thesis (1-15)
SEC. 001 CRN 83700 Simonton

Grading Restriction: P/NP only.

Repeatability: May be repeated.

Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate.

EM 501 Capstone Project (3-6)
SEC. 001 CRN 80003 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 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) (Video Recorded)
SEC. 001 CRN 80005 Students participating at Tullahoma classrooms
002 CRN 80006 Students participating by distance ed.
003 CRN 80007 Students participating at Knoxville DE classrooms

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

TIME: Monday & Wednesday 4:00 - 6:35 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.

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

EM 542 Design of Experiments for Engineering Managers (3) (Video Recorded)
SEC. 001 CRN 80009 UTSI and UTK students
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

PROF: 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 595 Special Topics in Engineering Management (3)
SEC. 001 CRN 83083
TEXT: None
TIME: TBD F-252
PROF: Dr. Janice Tolk

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

EM 600 Doctoral Research and Dissertation (3-15)
SEC. 002 CRN 82560 Simonton

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

ENVIROMENTAL ENGINEERING

ENVO 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 001 CRN 83884
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 10:00 – 11:15 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; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529; Nuclear Engineering 529).

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

INDUSTRIAL ENGINEERING

IE 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 001 CRN 80106
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 10:00 – 11:15 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.

MATERIALS SCIENCE AND ENGINEERING

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

SEC. 001 CRN 80155

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 10:00 – 11:15 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.

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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; Mechanical Engineering 529; Nuclear Engineering 529).

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

MATHEMATICS

MATH 443 Complex Variables (3)
SEC. 001 CRN 81212
TEXT: *Complex Variables*; Spiegel; Schaum's Outline McGraw Hill
TIME: Monday & Thursday 1:00 – 3:00 E-113
PROF: 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 578 Numerical Methods for Partial Differential Equations (3) **CANCELLED**
SEC. 001 CRN 83974
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
PROF: Dr. Christian Parigger

Numerical approximation of solutions of partial differential equations including conservation laws and hyperbolic, parabolic, and elliptic problems. Derivation, physical meaning, and implementation of schemes.

Recommended Background: A course in partial differential equations or 512 or 515, and familiarity with an operating system and a programming language.

MECHANICAL ENGINEERING

ME 500 Thesis (1-15)
SEC. 002 CRN 80186 Abedi
004 CRN 80187 Antar
023 CRN 80212 Anusonti-Inthra
024 CRN 80213 Flandro
027 CRN 80216 Majdalani
028 CRN 80217 Moeller
029 CRN 82356 Solies
031 CRN 83421 Vakili
032 CRN 83422 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 80219 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 80221
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 10:00 – 11:15 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.

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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 80235 Abedi
002 CRN 80236 Antar
003 CRN 80237 Anusonti-Inthra
004 CRN 82508 Flandro
005 CRN 82509 Majdalani
006 CRN 82510 Moeller
007 CRN 82511 Solies
010 CRN 82639 Vakili
009 CRN 82513 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 600 Doctoral Research and Dissertation (3-15)
SEC. 002 CRN 80246 Abedi
003 CRN 80247 Antar
004 CRN 80248 Anusonti-Inthra
005 CRN 80249 Flandro

020	CRN 80264	Majdalani
025	CRN 80270	Moeller
026	CRN 83059	Solies
029	CRN 83425	Vakili
030	CRN 83426	Zhang

Grading Restriction: P/NP only.

Repeatability: May be repeated.

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

NUCLEAR ENGINEERING

NE 529 Applications of Linear Algebra in Engineering Systems (3)
 SEC. 001 CRN 83885
 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 10:00 – 11:15 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; Mechanical Engineering 529).

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

PHYSICS

PHYS 500 Thesis (1-15)
 SEC. 001 CRN 81401 Chen
 003 CRN 81403 Crater
 004 CRN 81404 Davis
 005 CRN 81405 Parigger
 006 CRN 84040 Lewis

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 82635 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 (3)
SEC. 001 CRN 81410
TEXT: TBD

TIME: TBD
PROF: Dr. Christian Parigger

Repeatability: May be repeated. Maximum 15 hours.

PHYS 600 Doctoral Research and Dissertation (3-15)
SEC. 001 CRN 81413 Chen
003 CRN 81415 Crater
004 CRN 81416 Davis
005 CRN 81417 Parigger

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

PHYS 642 Advanced Topics in Modern Physics: Spectral Line Shapes (3)
SEC. 001 CRN 84269

TEXT: Subsidiary book, over and above current literature and past ICSLS conference proceedings: “Springer Series on Atomic, Optical, and Plasma Physics 56: Introduction to Plasma Spectroscopy” – This book shows an outstanding treatment of resonances, line profiles, and diagnostics applications, and is an excellent reference for various research topics covered in this research course. AUTHOR: Hans-Joachim Kunze; PUBLISHER: Springer; EDITION: First Ed., 2009; ISBN #: 978-3-642-02232-6
TIME: June 1 – June 6 (22nd ICSLS), and July 16, 23, 30 (Wednesday) 1-4pm; office hours July 16, 23, 30 (Wednesday) 11am – noon
ROOM: UTSI Auditorium, E111 for July 16, 23, 30 (Wednesdays) 1-4pm
PROF: Dr. Christian Parigger

This research course addresses advanced theoretical and experimental topics in the area of atomic and molecular transitions, high and low temperature plasmas, stellar atmospheres and interstellar media, processes in laser fields and innovative techniques for diagnostic purposes, including femtosecond laser radiation interacting with matter, combustion and plume diagnostics, and biomedical applications.

The course is composed of (a) attendance of the 22nd International Conference on Spectral Line Shapes at UTSI during June 1-6, see <http://icsls22.utsi.edu> (b) composition of 6 scientific summaries/critiques of 2 pages/each of presented papers at ICSLS, and (c) discussing and defending these critiques during the 3 class meetings on July 16, 23, 30. [Point (b) above will be reduced to 3 scientific summaries/critiques of 2 pages/each provided (i) an abstract (ii) a poster presentation and (iii) a 3-page paper is submitted for peer-review of your research paper by July 30 – submission of the abstract and upload of the poster must occur before the postdeadline date of May 28, presentation of the poster is expected to occur on June 2 and June 3.] The Invited and Contributed Talks are listed at <http://icsls22.utsi.edu> and will be presented by well-respected researchers. Topics include for example: plasma physics, combustion diagnostics, laser-induced phenomena, collision phenomena, computational modeling, femtosecond materials processing, astronomy, biomedical applications.

Advanced theoretical or experimental topics not covered in other courses.

Repeatability: May be repeated with consent of department. Maximum 9 hours.

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