Fall 2016
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
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## CALENDAR - 2016 FALL SEMESTER

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority Registration</td>
<td>March 21, 2016 – August 16, 2016</td>
</tr>
<tr>
<td>Admission to Candidacy Forms for Fall 2016 Commencement</td>
<td>August 9, 2016</td>
</tr>
<tr>
<td>Fall 2016 Graduation Application Deadline (submit online at MyUTK)</td>
<td>August 9, 2016</td>
</tr>
<tr>
<td>Graduation Fee Payment Deadline (MS $30, PhD $75)</td>
<td>August 9, 2016</td>
</tr>
<tr>
<td>Payment Due for Priority Registration</td>
<td>August 15, 2016</td>
</tr>
<tr>
<td>Late Registration and late fees begin ($100 Late Fee)</td>
<td>August 17-30, 2016</td>
</tr>
<tr>
<td>Classes begin</td>
<td>August 17, 2016</td>
</tr>
<tr>
<td>Last Day to finalize register, add, change grading options or drop without a “W”</td>
<td>August 26, 2016</td>
</tr>
<tr>
<td>Payment Due for Late Registration</td>
<td>August 26, 2016</td>
</tr>
<tr>
<td>Registration after 14th day late fee ($200 Late Fee)</td>
<td>August 31, 2016-End of Term</td>
</tr>
<tr>
<td>Labor Day</td>
<td>September 5, 2016</td>
</tr>
<tr>
<td>Fall Break (No Classes)</td>
<td>October 6 - 7, 2016</td>
</tr>
<tr>
<td>Register to attend the Graduate Hooding Ceremony</td>
<td>TBD</td>
</tr>
<tr>
<td>Purchase cap and gown and order hood (865-974-3459)</td>
<td>TBD</td>
</tr>
<tr>
<td>Last day to take final exam (non-thesis/thesis/dissertation)</td>
<td>November 4, 2016</td>
</tr>
<tr>
<td>Drop with a “W”</td>
<td>November 8, 2016</td>
</tr>
<tr>
<td>Thesis/Dissertation Deadline 5:00 p.m. EST</td>
<td>November 18, 2016</td>
</tr>
<tr>
<td>Submit report of final examination (Pass/Fail) form</td>
<td>November 18, 2016</td>
</tr>
<tr>
<td>Thanksgiving Holidays</td>
<td>November 24 – 25, 2016</td>
</tr>
<tr>
<td>First Study Period</td>
<td>November 30, 2016</td>
</tr>
<tr>
<td>Deadline for Submission of Admission to Candidacy for students</td>
<td>December 1, 2016</td>
</tr>
<tr>
<td>Graduating Spring 2017 and Graduation Application</td>
<td>December 1, 2016</td>
</tr>
<tr>
<td>All &quot;INCOMPLETE&quot; must be removed for Graduation</td>
<td>December 1, 2016</td>
</tr>
<tr>
<td>Classes End</td>
<td>December 1, 2016</td>
</tr>
<tr>
<td>Total Withdraw from the University Deadline</td>
<td>December 1, 2016</td>
</tr>
<tr>
<td>Second Study Period</td>
<td>December 2, 2016</td>
</tr>
<tr>
<td>Final Exam Period</td>
<td>December 5, 6 &amp; 7, 2016</td>
</tr>
<tr>
<td>Graduate Hooding Ceremony (UTK)</td>
<td>December 8, 2016</td>
</tr>
<tr>
<td>COMMENCEMENT (UTK)</td>
<td>December 9, 2016</td>
</tr>
<tr>
<td>Official Graduation Date</td>
<td>December 9, 2016</td>
</tr>
</tbody>
</table>

Second thesis/dissertation deadlines
- Defense Completed by December 1, 2016
- Second Deadline Application Submitted by December 1, 2016
- Thesis/Dissertation Submission Deadline by January 6, 2017
  (Student will receive diploma spring 2017 semester, but will not be required to register for thesis/dissertation credits)

A new graduation application must be submitted for Spring graduation. For more Information on graduation steps see [http://gradschool.utk.edu/graduation.shtml](http://gradschool.utk.edu/graduation.shtml)

## SPRING SEMESTER 2017

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority Registration</td>
<td>TBD</td>
</tr>
<tr>
<td>Final Registration</td>
<td>TBD</td>
</tr>
<tr>
<td>Classes Begin</td>
<td>January 11, 2017</td>
</tr>
<tr>
<td>Martin Luther King Day (Holiday)</td>
<td>January 16, 2017</td>
</tr>
<tr>
<td>Spring Break</td>
<td>March 13 – 17, 2017</td>
</tr>
<tr>
<td>Spring Recess</td>
<td>April 14, 2017</td>
</tr>
</tbody>
</table>
Classes End .......................................................................................................................... April 28, 2017
Study Period ..................................................................................................................... May 1, 2017
Exam Period ..................................................................................................................... May 2, 3, & 4, 2017
Graduate Hooding Ceremony (UTK) ............................................................................... May 11, 2017
University College Commencement Ceremonies .......................................................... May 10 – 12, 2017
Official Graduation Date on Transcript ........................................................................ May 13, 2017

Dates may be revised without notice. Please refer to the following sites for updates:
http://registrar.tennessee.edu/academic_calendar/index.shtml

FALL SEMESTER 2016
STUDY PERIOD AND FINAL EXAM SCHEDULE

LAST DAY OF CLASSES................................................................................................... December 1, 2016

STUDY PERIOD .............................................................................................................. November 30, 2016 and December 2, 2016

FINAL EXAMS

<table>
<thead>
<tr>
<th>REGULAR CLASS TIME</th>
<th>(Same Classroom)</th>
<th>EXAM TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Day – Monday, December 5, 2016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:45 - 9:00</td>
<td>M/Th</td>
<td>7:45 - 9:45</td>
</tr>
<tr>
<td>10:45 - 12:00</td>
<td>M/Th</td>
<td>10:15 - 12:15</td>
</tr>
<tr>
<td>9:15 - 10:30</td>
<td>M/Th</td>
<td>1:00 - 3:00</td>
</tr>
<tr>
<td>2:30 - 3:45</td>
<td>M/Th</td>
<td>3:30 - 5:30</td>
</tr>
<tr>
<td><strong>2nd Day – Tuesday, December 6, 2016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:15 - 10:30</td>
<td>Tu/Fri</td>
<td>7:45 - 9:45</td>
</tr>
<tr>
<td>10:45 - 12:00</td>
<td>Tu/Fri</td>
<td>10:15 - 12:15</td>
</tr>
<tr>
<td>1:00 - 2:15</td>
<td>Tu/Fri</td>
<td>1:00 - 3:00</td>
</tr>
<tr>
<td>2:30 - 3:45</td>
<td>Tu/Fri</td>
<td>3:30 - 5:30</td>
</tr>
<tr>
<td><strong>3rd Day – Wednesday, December 7, 2016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:45 - 9:00</td>
<td>Tu/Fri</td>
<td>7:45 - 9:45</td>
</tr>
<tr>
<td>1:00 - 2:15</td>
<td>M/Th</td>
<td>10:15 - 12:15</td>
</tr>
</tbody>
</table>

**** ATTENTION ****

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

NO CLASSES WILL BE IN SESSION
AT THIS TIME
REGISTRATION ANNOUNCEMENT
FALL SEMESTER 2016

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 A-206, 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 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 the Director of Administrative and Student Affairs, University of Tennessee Space Institute, MS-1, 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 Dee Merriman, Director of Administrative and Student Affairs, at (931) 393-7213 or 888-822-8874 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 A-206, (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 2016 must remove all INCOMPLETE GRADES by December 1, 2016. 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 Human Resources Office (room C-106 ext. 37267) for further information.

GENERAL SEMINAR

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

FINAL EXAM DATES

Study Period – November 30, 2016 and December 2, 2016
Final Exams – December 5, 6, & 7, 2016

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.

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.
AEROSPACE ENGINEERING

AE  500  Master’s Thesis (1-15)
SEC.  001  CRN 42734  Abedi
009  CRN 42750  Anusonti-Inthra
010  CRN 42754  Brooks
011  CRN 42756  Majdalani
012  CRN 42759  Moeller
013  CRN 42760  Schmisser
014  CRN 42761  Solies
015  CRN 42764  Vakili
021  CRN 42774  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.  002  CRN 42779  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  511  Inviscid Flow (3)
SEC.  002  CRN 46341
TIME: Tuesday & Thursday 2:40 – 3:55  E-110
PROF: Dr. Steven Brooks

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

AE  515  Air Vehicle Aerodynamics and Performance (3)
SEC.  001  CRN 45409  (Video Recorded)
TEXT: M. Asselin; An Introduction to Aircraft Performance; AIAA Education Series, Reston, VA 1997; ISBN 1-75-623241-X
TIME: Tuesday & Friday 1:00 – 2:15  E-111
PROF: Dr. Peter Solies
Application of aerodynamics principles to air vehicles to provide estimates of performance, stability, and control characteristics for subsonic to hypersonic speeds. Relations among thrust, drag, lift and attitude, propulsion systems, vehicle performance characteristics, and trajectory optimization.

AE  517  Finite Elements for Engineering Applications (3)
SEC.  001  CRN 51392  (Same as ME 517 001 CRN 51366)
TEXT:  Notes will be provided. Recommended books:
       ISBN: 9780979004902
TIME:  Tuesday & Thursday 10:10 – 11:25  E-110
PROF:  Dr. Reza Abedi

Modern computational theory applied to conservation principles across the engineering sciences. Weak forms, extremization, boundary conditions, discrete implementation via finite element, finite difference, finite volume methods. Asymptotic error estimates, accuracy, convergence, stability. Linear problem applications in 1, 2 and 3 dimensions, extensions to non-linearity, non-smooth data, unsteady, spectral analysis techniques, coupled equation systems. Computer projects in heat transfer, structural mechanics, mechanical vibrations, fluid mechanics, heat/mass transport.

Cross-listed: (Same as Mechanical Engineering 517)

Comment(s): Bachelor’s degree in engineering or natural science required.

Registration Permission: Consent of instructor.

AE  521  Aerodynamics of Compressible Fluids I (3)
SEC.  001  CRN 46137
TIME:  Monday & Wednesday 10:10 – 11:25  E-110
PROF:  Dr. John Schmisseur

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

AE  590  Selected Engineering Problems (2-6)
SEC.  010  CRN 48030  Abedi
       002  CRN 42787  Anusonti-Inthra
       003  CRN 42788  Brooks
       004  CRN 46139  Majdalani
       005  CRN 46140  Moeller
       006  CRN 46141  Schmisseur
       007  CRN 46142  Solies
       008  CRN 46143  Vakili
       009  CRN 46144  Zhang

Repeatability: May be repeated. Maximum 6 hours.

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

Registration Permission: Consent of advisor.
AE 595  Aerospace Engineering Seminar (1)
SEC. 001  CRN 42791
TEXT: None
TIME: Will be announced through email
PROF: Dr. Ahmad Vakili

All phases of aerospace engineering, reports on current research at the University of Tennessee, Knoxville, and UTSI.
Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 20 hours.

AE 599  Special Topics in Aerospace Engineering: Computational Fluid Dynamics I (3)
SEC. 001  CRN 42794  (Same as ME 599 001 CRN 43482)
TIME: Monday & Wednesday 11:40 – 12:55 E-110
PROF: Dr. Greg Power

This course uses a commercial CFD code that is widely accepted and used in industries and government labs as a hands-on introduction to computational fluid dynamics. After a brief review of the fundamentals, the course will cover various aspects of the simulation process including geometry modeling, grid generation, solution strategy and post processing primarily through practical examples that bring out the importance of proper understanding of the underlying physics for the problem. Examples will also attempt to cover a wide range of problems that cover different types of flow conditions (incompressible/compressible, laminar/turbulent, steady/unsteady flows, free surface flows, flows with heat transfer and possibly reacting flows).
Repeatability: May be repeated. Maximum 6 hours.
Registration Permission: Consent of instructor.

AE 600  Doctoral Research/Dissertation (3-15)
SEC. 004  CRN 42805  Abedi
005  CRN 42807  Anusonti-Inthra
006  CRN 42809  Brooks
007  CRN 42811  Majdalani
008  CRN 42813  Moeller
014  CRN 42819  Schmissuer
015  CRN 42820  Solies
017  CRN 46349  Vakili
018  CRN 46350  Zhang

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

AE 601  Doctoral Research Methodology (3)
SEC. 002  CRN 49698
TEXT: TBD
TIME: TBD
PROF: Dr. Kivanc Ekici
Methods of planning and conducting original research and proposal writing.

Registration Restriction(s): Minimum student level – graduate / doctoral students.
Registration Permission: Departmental approval.

<table>
<thead>
<tr>
<th>AE 681</th>
<th>Advanced Viscous Flow Theory (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEC.</td>
<td>001 CRN 49403</td>
</tr>
<tr>
<td>TEXT:</td>
<td>TBD; Handouts will be provided</td>
</tr>
<tr>
<td>TIME:</td>
<td>Monday &amp; Wednesday 8:40 – 9:55 E-211</td>
</tr>
<tr>
<td>PROF:</td>
<td>Dr. Ahmad Vakili</td>
</tr>
</tbody>
</table>


(DE) Prerequisite(s): 512, continuum mechanics, and Mathematics 562.
Registration Restriction(s): Minimum student level – graduate.

<table>
<thead>
<tr>
<th>AE 682</th>
<th>Rocket Propulsion II (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEC.</td>
<td>001 CRN 51325</td>
</tr>
<tr>
<td>TIME:</td>
<td>Monday &amp; Thursday 1:00 – 2:15 E-113</td>
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<tr>
<td>PROF:</td>
<td>Dr. Trevor Moeller</td>
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</tbody>
</table>

Solid propellant rocket performance, homogeneous and heterogeneous propellant chemistry and combustion system performance, thermal decomposition and gas phase reaction models; effect of chamber pressure and additives on solid propellant burn rates, erosive burning; analysis of two-phase solid rocket exhaust flow. Introduction to nuclear and electric propulsion; electrical resistance and electric field (ion) engine performance, magnetohydrodynamic thrusters, traveling wave thrusters; exotic propulsion systems.

(RE) Prerequisite(s): 581.
Registration Restriction(s): Minimum student level – graduate.
Registration Permission: Consent of Instructor.

**AVIATION SYSTEMS**

<table>
<thead>
<tr>
<th>AS 500</th>
<th>Master’s Thesis (1-15)</th>
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<tbody>
<tr>
<td>SEC.</td>
<td>001 CRN 46145 Brooks</td>
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<tr>
<td></td>
<td>002 CRN 46146 Solies</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>AS 502</th>
<th>Registration for Use of Facilities (1-15)</th>
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<tr>
<td>SEC.</td>
<td>001 CRN 46149 Brooks</td>
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<tr>
<td></td>
<td>002 CRN 46150 Solies</td>
</tr>
</tbody>
</table>
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.

AS  522  Experimental Flight Mechanics: Fixed Wing Stability & Control (3)
SEC.  001  CRN 46154
TEXT: Ralph D. Kimberlin; *Flight Testing of Fixed Wing Aircraft;* AIAA; 1st Edition;
ISBN 1-56347-564-2
TIME: Tuesday & Friday  10:30 – 11:45  Airport Classroom
PROF:  Dr. Peter Solies

Fundamental theories, flight test techniques, and data collection and analyses for fixed wing aircraft stability and control. Topics: static and dynamic longitudinal stability, longitudinal maneuvering stability and control, static and dynamic lateral-directional stability, lateral control power, and departure testing. Weekly classroom academics with approximately 4-6 flight labs.

*(DE) Prerequisite(s): 516 and 521.*

AS  550  Project in Aviation Systems (3)
SEC.  001  CRN 46155  Brooks
SEC.  002  CRN 46156  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  Master’s Thesis (1-15)
SEC.  012  CRN 47158  Johnson

**Grading Restriction:** P/NP only.

**Repeatability:** May be repeated.

**Credit Level Restriction:** Graduate credit only.

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

BME  505  All Things Carbon (3)
SEC.  001  CRN 51367
TEXT: TBD
TIME: Monday & Wednesday  1:10 – 2:25  E-110
PROF:  Dr. Jacqueline Johnson

Carbon is the basis of life; as such BME students have the ability to study this element along with associated biological applications. Diamond-like carbon has potential as a coating for orthopedic implants. Nano-crystalline diamond can be used as a biosensor. Carbon nanotubes have applications in pharmacy and medicine due to their large surface area. Carbon is a suitable coating for magnetic nanoparticles, which can be used for hyperthermia and magnetic resonance imaging. In summary the
ability of carbon to enhance medical diagnostics and treatment is wide-ranging and not fully exploited. Students will learn current applications of carbon in medicine and be able to project future uses once this course is completed.

BME 511 Biotransport Processes (3)
SEC. 002 CRN 51400
TEXT: TBD
TIME: Tuesday & Thursday 1:10 – 2:25 E-110
PROF: Dr. S. Sarles

Introduction of an integrative set of computational problem solving tools providing numerical foundations for Biomedical Engineering. This course will apply numerical methods to applications in systems, organs, cellular, and molecular systems.

(DE) Prerequisite(s): 503.

BME 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 002 CRN 47251 (Video Recorded)
TIME: Tuesday & Friday 9:30 – 10:45 E-111
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.


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

BME 595 Biomedical Seminar (1)
SEC. 002 CRN 46815
TEXT: None
TIME: Will be announced through email
PROF: Dr. Jacqueline Johnson

All phases of biomedical engineering, reports on current research at UTK and UTSI.

Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 20 hours.
Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate.
BME  600  Doctoral Research/Dissertation (3-15)
SEC.  011  CRN  46816   Johnson

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

BME  601  Doctoral Research Methodology (3)
SEC.  002  CRN  49699
TEXT:  TBD
TIME:  TBD
PROF:  Dr. Eric Boder

Intensive, individualized experience in reviewing literature, evaluating experimental or theoretical
methods, planning a research project, and presenting research project plans orally and in writing.
Registration Restriction(s): Minimum student level – graduate. PhD students only.
Registration Permission: Consent of instructor.

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

ECE  529  Applications of Linear Algebra in Engineering Systems (3)
SEC.  002  CRN  47252   (Video Recorded)
TEXT: Advanced Linear Algebra for Engineers with MATLAB; Sohail A. Dianat and Eli S. Saber;
TIME:  Tuesday & Friday 9:30 – 10:45   E-111
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
Cross-listed: (Same as Chemical and Biomolecular 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/Dissertation (3-15)
SEC.  031  CRN  50377   Bomar

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

EM 500 Master’s Thesis (1-15)
SEC. 001 CRN 48268 Simonton
002 CRN 50267 Yu

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 43152 Tolk
002 CRN 49108 Tolk

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 43153 Simonton
002 CRN 50272 Yu

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 532 Productivity and Quality Engineering (3)
SEC. 001 CRN 45466 (Prerecorded)


TIME: TBD
PROF: Dr. Janice Tolk

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

EM 533 Theory and Practice of Engineering Management (3)
SEC. 001 CRN 43154 UTSI students participating at Tullahoma
Principles of engineering management, including: business and organization design, culture, leadership, marketing and competition in global economy, motivation and performance management, empowerment, organizational behavior, and diversity. Systems thinking, learning organizations, and systems dynamics modeling. Principle application to work settings and case studies.

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

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

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

Recommended Background: Graduate standing in Engineering or Business.

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


TIME: Thursday 4:00 – 6:35  E-113

PROF: Dr. James Simonton

Forum to study advanced topics individually or in groups. 

*Repeatability: May be repeated if topic differs. Maximum 6 hours.*

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

Course Description: Theoretical foundations of General System Theory as they are applied to engineering and organizational enterprises addressing issues concerning systems, the effectiveness of organizations in the context of traditional management related issues, as well as incorporating the critical impact of systems thinking on the socio-technical environment.

INDUSTRIAL ENGINEERING

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

SEC. 002 CRN 47253 (Video Recorded)


TIME: Tuesday & Friday 9:30 – 10:45  E-111

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.


*Cross-listed: (Same as Chemical and Biomolecular 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.*

MATERIAL SCIENCE ENGINEERING

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

SEC. 002 CRN 47254 (Video Recorded)


TIME: Tuesday & Friday 9:30 – 10:45  E-111

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.


Cross-listed: (Same as Biomedical Engineering 529; Chemical and Biomolecular Engineering 529; Civil Engineering 529, Electrical and Computer Engineering 529; Environmental Engineering 529; Industrial Engineering 529; Nuclear Engineering 529).

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

MATHEMATICS

Math 404 Applied Vector Calculus (3) CANCELLED
SEC. 001 CRN 43322
TIME: Tuesday 2:00 – 4:30 F-253
PROF: Dr. Jan Zijlstra

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

MECHANICAL ENGINEERING

ME 500 Master’s Thesis (1-15)
SEC. 001 CRN 43441 Abedi
021 CRN 43461 Anusonti-Inthra
022 CRN 43462 Brooks
023 CRN 43463 Majdalani
024 CRN 43464 Moeller
025 CRN 43465 Schmisser
034 CRN 46159 Solies
035 CRN 46160 Vakili
036 CRN 46161 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 46162 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  511 Fundamentals of Heat Conduction (3)
SEC.  001 CRN  45700
TIME: Monday & Wednesday     2:40 – 3:55 E-110 (no connection)
PROF: Dr. Feng-Yuan Zhang


Recommended Background: Undergraduate heat transfer course.

ME  517 Finite Elements for Engineering Applications (3)
SEC.  001 CRN  51366  (Same as AE 517 001 51392)
TEXT: Notes will be provided. Recommended books:
TIME: Tuesday & Thursday      10:10 – 11:25      E-110
PROF: Dr. Reza Abedi

Modern computational theory applied to conservation principles across the engineering sciences. Weak forms, extremization, boundary conditions, discrete implementation via finite element, finite difference, finite volume methods. Asymptotic error estimates, accuracy, convergence, stability. Linear problem applications in 1, 2 and 3 dimensions, extensions to non-linearity, non-smooth data, unsteady, spectral analysis techniques, coupled equation systems. Computer projects in heat transfer, structural mechanics, mechanical vibrations, fluid mechanics, heat/mass transport.

Cross-listed: (Same as Aerospace Engineering 517.)

Comment(s): Bachelor’s degree in engineering or natural science required.
Registration Permission: Consent of instructor.

ME  521 Thermodynamics I (3)
SEC.  002 CRN  46342
TEXT: *Thermodynamics*; 1st Edition by Sanford Klein (Author), Gregory Nellis (Author)
TIME: Monday          4:00 – 6:35       E-111
PROF: Dr. Paul Marotta

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

ME  524  Fracture Mechanics (3)
SEC. 001  CRN  49402
TIME:  Tuesday & Thursday 8:40 – 9:55  E-110
PROF:  Dr. Reza Abedi

Mechanisms of fracture and crack growth; stress analysis; crack tip plastic zone; energy principles in fracture mechanics; fatigue-crack initiation and propagation; fracture mechanic design and fatigue life prediction. Analytical, numerical, and experimental methods for determination of stress intensity factors. Current topics in fracture mechanics.

Registration Permission: Consent of instructor.

ME  525  Combustion of Chemically Reacting Flow I (3)
SEC. 001  CRN  51338
TIME:  Tuesday & Friday 1:00 – 2:15  E-113
PROF:  Dr. Trevor Moeller

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

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

ME  529  Applications of Linear Algebra in Engineering Systems (3)
SEC. 002  CRN  47255  (Video Recorded)
TIME:  Tuesday & Friday 9:30 – 10:45  E-111
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.

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; Nuclear Engineering 529).
Comment(s): Graduate standing or consent of instructor required.

ME  584  Turbomachinery Systems I (3)
SEC.  001  CRN  45709  (Video Recorded)
TEXT:  Jack D. Mattingly; Elements of Propulsion: Gas Turbines and Rockets; 2006;
       ISBN 1-56347-779-3
TIME:  Tuesday & Thursday  4:00 – 5:15       E-111
PROF:  Dr. Milt Davis

Ideal cycle analysis of turbine engines, real cycle analysis, component performance analysis, component design and systems integration (inlets, nozzles, combustors, compressors, turbines), flowthrough theory, turbine engine component matching, transient operation, surge and rotating stall, engine control systems, structural considerations.
Comment(s): First-year graduate standing required.
Registration Permission: Consent of instructor.

ME  590  Selected Engineering Problems (3)
SEC.  001  CRN  43478  Abedi
  002  CRN  43479  Anustonti-Inthra
  003  CRN  45715  Brooks
  004  CRN  46163  Majdalani
  005  CRN  46164  Moeller
  006  CRN  46165  Schmisseur
  007  CRN  46166  Solies
  008  CRN  46167  Vakili
  009  CRN  46168  Zhang

Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 6 hours.
Comment(s): Enrollment limited to students in problems option.
Registration Permission: Consent of advisor.

ME  595  Mechanical Engineering Seminar (1)
SEC.  001  CRN  43480
TEXT:  None
TIME:  Will be announced through email
PROF:  Dr. Ahmad Vakili

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.

ME  599  Special Topics in Aerospace Engineering: Computational Fluid Dynamics I (3)
SEC.  001  CRN  43482  (Same as AE 599 001 CRN 42794)
TEXT:  Applied Computational Aerodynamics: A Modern Engineering Approach; Russell M.
       Cummings, William H. Mason, Scot A Morton, David R. McDaniel
TIME:  Monday & Wednesday  11:40 – 12:55       E-110
PROF: Dr. Greg Power

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

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

ME 600 Doctoral Research/Dissertation (3-15)
SEC.  015 CRN 43499 Abedi
016 CRN 43500 Anusonti-Inthra
018 CRN 43502 Brooks
019 CRN 43503 Majdalani
026 CRN 43510 Moeller
027 CRN 43511 Schmisseur
028 CRN 43512 Solies
029 CRN 48032 Vakili
030 CRN 48033 Zhang

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

ME 601 Doctoral Research Methodology (3)
SEC.  002 CRN 50380

TEXT: TBD
TIME: TBD
PROF: Dr. Kivanc Ekici

Methods of planning and conducting original research and proposal writing.
Registration Restriction(s): Minimum student level – doctoral student.
Registration Permission: Departmental approval.

PHYSICS

Phys 500 Master’s Thesis (1-15)
SEC.  002 CRN 41919 Davis
003 CRN 41999 Parigger

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

Phys 503 Physics Colloquium (1)
SEC.  002 CRN 42009
TEXT: None
Lectures and discussion on current research topics. Continuous registration required for current graduate students.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 6 hours.

Phys 507 Contemporary Optics (3)
SEC. 001 CRN 49153
TEXT: TBD
TIME: Tuesday & Thursday 9:10 – 10:25 TBD
PROF: Dr. Lloyd Davis

Topics in geometrical, physical, Fourier, and nonlinear optics and introductory laser physics. Extensive use of computer calculations and design of practical and sophisticated optical systems.

Phys 599 Seminars (1)
SEC. 009 CRN 49155
TEXT: Classic Texts and Literature
TIME: 2nd, 4th Thursday /each month 3:00 - 4:30 TBD
PROF: Dr. Christian Parigger

(a) Mechanics; (b) Radiation; (c) Heat and Thermodynamics; (d) Electricity and Magnetism; (e) Modern Physics.

Repeatability: May be repeated with consent of department. Maximum 18 hours.

Phys 600 Doctoral Research/Dissertation (3-15)
SEC. 002 CRN 42047 Davis
SEC. 003 CRN 42048 Parigger

Grading Restriction: P/NP only.

Repeatability: May be repeated.

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

Phys 605 Laser Spectroscopy (3)
SEC. 001 CRN 48035
TIME: Monday & Thursday 1:00 – 2:15 E-111
PROF: Dr. Christian Parigger

Applications of lasers to spectroscopy of atomic and molecular systems; absorption, laser-induced fluorescence, and Raman spectroscopy; molecular and atomic coherence, quantum beats, resonance fluorescence, photon echoes, self-induced transparency; saturation and Doppler-free spectroscopy; laser cooling and trapping.

(DE) Prerequisite(s): 521 and 541.

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