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**CALENDAR  
SUMMER SEMESTER 2008**

Registration.....	March 3 – May 27, 2008
Submit Admission to Candidacy Forms for Summer 2008 Graduation .....	April 25, 2008
Submit Graduation Application .....	April 25, 2008
Late Registration and late fees begin .....	May 28 – June 10, 2008
Memorial Day (Holiday).....	May 26, 2008
Classes begin.....	June 2, 2008
Last Day to drop without “W” on the transcript, change to/from audit, add a course without the instructor’s signature.....	June 10, 2008
Pay Graduation Fee.....	June 20, 2008
Last day to add/change credit with signatures .....	June 26, 2008
Preliminary/Thesis/Dissertation Review Deadline .....	June 27, 2008
Last day to schedule final exam (thesis) .....	July 3, 2008
Independence Day Holiday.....	July 4, 2008
Last day to schedule final exam (non-thesis/capstone students).....	July 3, 2008
Last day to schedule final exam (dissertation).....	July 11, 2008
Last day to take final exam (thesis/dissertation students).....	July 18, 2008
Last day to take final exam (non-thesis/capstone students).....	July 18, 2008
Last day to defend dissertation .....	July 18, 2008
Drop with a “W” .....	July 22, 2008
Final paper or electronic thesis/dissertation must be approved and accepted in Knoxville By (5:00 P.M. EST) .....	August 1, 2008
Submit Pass/Fail form to UTSI Registrar’s Office .....	August 1, 2008
Deadline for submission of Admission to Candidacy for students graduating Fall 2008.....	August 7, 2008
Deadline for removing "INCOMPLETE" grades .....	August 7, 2008
Classes End.....	August 7, 2008
Withdraw from all classes.....	August 7, 2008
Exam Period (Summer exams are given during the regularly scheduled class meeting times. Second thesis/dissertation deadline (Student will receive diploma August 2008 but do not have to register for Fall 2008) (Defense completed by August 7).....	August 15, 2008
No Graduate Hooding or Summer Commencement – Graduation Date.....	August 15, 2008

**FALL SEMESTER 2008**

Priority Registration for FALL Semester 2008 on CPO.....	March 10, 2008
Late Registration.....	August 13, 2008
Classes begin.....	August 20, 2008
Labor Day (Holiday).....	September 1, 2008
Fall Break.....	October 9 - 10, 2008
Thanksgiving Break .....	November 27 - 28, 2008
Classes End.....	December 2, 2008
Study Period.....	December 3, 6, & 7, 2008
Exam Period.....	December 4, 5, 8, 9, 10 & 11, 2008
Doctoral Hooding Ceremony (UTK).....	December 12, 2008
Commencement (UTK) .....	December 13, 2008

**SUMMER SEMESTER 2008  
FINAL STUDY DAY AND EXAM SCHEDULE**

LAST DAY OF CLASSES.....August 7, 2008

FINAL EXAMS FOR SUMMER EXAMS 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 2008**

**REGISTRATION PROCEDURE**

**ADVISING**

Graduate students should contact their departmental faculty to arrange an advising appointment. The Graduate Studies Web Page is <http://gradstudies.utk.edu/default.shtml>

**REGISTRATION**

UTSI students **MUST** register on the web at Circle Park Online. The registration system will be available Monday through Saturday, 6:00 AM - 11:00 PM (CST) and Sundays 12:00 PM - 5:00 PM (CST). Registration will be March 3, 2008 – May 27, 2008. Late registration will be May 28 - June 10, 2008. Classes begin June 2, 2008.

**Plan your schedule. Here's a table to help with this process:**

<b>Department Number</b>	<b>Course Number</b>	<b>Section Number</b>	<b>Spec.Credit/Grading</b>	<b>Credit Hours</b>	<b>Hours/Days</b>	<b>Place</b>

**Students log on to CPO using their Net ID and password. If you do not know your Net ID and Password, please visit the University Registrar's website at [http://registrar.tennessee.edu/student\\_id.shtml](http://registrar.tennessee.edu/student_id.shtml). Scroll down the page to "What is a Net ID and Net ID password?" You will find helpful information about obtaining Net IDs and Net ID passwords.**

**CPO Technical Support: Send email including your return email address in the text of your message to [cpo@utk.edu](mailto:cpo@utk.edu)**

**Web address for Circle Park Online <https://cpo.utk.edu/CPOWeb/>**

**Days of the Week**

**M-Monday    T-Tuesday    W-Wednesday R-Thursday    F-Friday    S-Saturday**

## FINANCIAL CALENDAR

<b>Last Registration Day for Receiving Statements by Mail</b>	<b>May 16, 2008</b>
<b>Statement Information Available in Bursar Areas or at CPO.UTK.EDU</b>	<b>May 19, 2008</b>
<b>Priority Registration Payment/Confirmation Deadline (3:30 pm CDT)</b>	<b>May 27, 2008</b>
<b>Late Registration/Late Fees Begin</b>	<b>May 28, 2008</b>
<b>Late Registration Payment/Confirmation Deadline (3:30 pm CDT)</b>	<b>June 10, 2008</b>

## CREDIT CARD PAYMENTS:

**NOTE:** If you pay your fees using Circle Park Online (CPO) using a credit/debit card (Discover, VISA, Mastercard) you will be assessed a 2.5% service fee. **To avoid this service fee you will need to make payment to the UTSI Business Office.**

## SPECIAL BILLING – THIRD PARTY BILLING:

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

**STUDENTS ARE ULTIMATELY RESPONSIBLE FOR ALL CHARGES. THEY MUST COMPLETE A CONFIRMATION OF ATTENDANCE FORM AND MAKE CERTAIN MINIMUM PAYMENT AMOUNTS CREDITED OR AUTHORIZED ON OR BEFORE THE PAYMENT DUE DATE IN ORDER TO AVOID LATE PAYMENT FEE ASSESSMENT AND SCHEDULE CANCELLATION.**

If you have any questions concerning third-party billing please call Jennifer Boyles at 931-393-7297 or 888-822-8874 ext 297 or by email [jboyles@utsi.edu](mailto:jboyles@utsi.edu)

## TOLL-FREE NUMBER

<b>For a specific office:</b>	<b>1-888-822-UTSI (8874) and the extension number.</b>
<b>For general information:</b>	<b>1-888-822-UTSI (8874)</b>
<b>Admissions Office:</b>	<b>1-888-822-UTSI (8874)-432</b>
<b>Bookstore:</b>	<b>1-888-822-UTSI (8874)-204</b>
<b>Business Office:</b>	<b>1-888-822-UTSI (8874)-204</b>
<b>Registrar's Office:</b>	<b>1-888-822-UTSI (8874)-228</b>

## BOOKSTORE HOURS

The Bookstore is located in Lower C-Wing Business Office. The Bookstore hours are 8:00 a.m. - 4:00 p.m. All textbooks will be returned to the publisher one week after midterm. For

further information concerning books contact the Bookstore, ext. 204 or 314 or by email Robin Nee at [rne@utsi.edu](mailto:rne@utsi.edu); or Vicki Carr at [vcarr@utsi.edu](mailto:vcarr@utsi.edu)

**APPLICATION FOR ADMISSION**

No student will be allowed to register unless a completed Application for Admission to the Graduate School of the University of Tennessee, Knoxville (UTK) is on file in the Registrar's Office. An Application for Admission to the UTK Graduate School must be accompanied by a \$35.00 non-refundable application fee, payable to The University of Tennessee Space Institute. Applicants are required to provide one official transcript of all undergraduate and graduate records. Students may apply on-line at <http://admissions.utk.edu/graduate/apply.shtml> [click on APPLY ONLINE and Follow Directions]. Applications for Admission and Transcripts from part-time students should be sent to the Registrar's Office, A102, Mail Stop 7, UTSI, Tullahoma, TN 37388-9700. Full-time students send Application for Admission, transcripts, GRE scores (if required); and if international application, TOEFL scores to the Admissions Office, A104, Mail Stop 5, UTSI, Tullahoma, TN 37388-9700.

**PAYMENT OF FEES**

Payment of fees is due at time of registration. Late fees will begin on May 28. The University of Tennessee Space Institute accepts Visa, MasterCard and Discover.

**FEES OF DISTANCE STUDENTS**

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

<b>Aviation Systems</b>	<b>Stephen Corda</b>	<b>931-393-7413</b>	<b><a href="mailto:scorda@utsi.edu">scorda@utsi.edu</a></b>
<b>Engineering Mgt.</b>	<b>Penny Morris</b>	<b>931-393-7293</b>	<b><a href="mailto:pmorris@utsi.edu">pmorris@utsi.edu</a></b>

**TUITION AND/OR MAINTENANCE FEES\***

**Full Fees For In-State Students (per semester)**

<b>Maintenance Fee .....</b>	<b>\$2,954.00*</b>
<b>Programs and Services Fee .....</b>	<b>75.00</b>
<b>Total .....</b>	<b>\$3,029.00</b>

**Full Fees For Out-Of-State Students (per semester)\***

<b>Maintenance Fee .....</b>	<b>\$2,954.00*</b>
<b>Programs and Services Fee .....</b>	<b>75.00</b>
<b>Tuition .....</b>	<b>5,971.00</b>
<b>Total .....</b>	<b>\$9,000.00</b>

**\*All fees are subject to changes approved by the Board of Trustees prior to the beginning of the term.**

## **TUITION FOR PART TIME STUDENTS**

**Part-time students may elect to pay fees computed by the semester hour credit as follows:**

<b>IN-STATE</b>	<b>\$329.00 per semester hour</b>
<b>3 hrs.</b>	<b>\$987.00</b>
<b>OUT-OF-STATE</b>	<b>\$993.00 per semester hour</b>
<b>3 hrs.</b>	<b>\$2,979.00</b>

## **PROGRAMS AND SERVICES FEE**

All students enrolled in eight semester hours or more for Summer Semester are assessed an activity fee of \$75.00 per semester. Part-time students taking fewer than eight hours will be assessed at the rate of \$10.00 per semester hour. The Programs and Services Fee is non-refundable. Research assistants and fellowship/scholarship students, who may have a waiver of fees (tuition), must pay appropriate University Programs and Services Fee.

Part-time students enrolled for Recorded classes at off campus centers and students residing out of state are not required to pay the programs and services fee.

## **RETURNED CHECK POLICY**

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

## **DEFERRED PAYMENT PLAN**

Although fees, rent and other University expenses are due and payable at the beginning of each term, a full-time student in good financial standing with a definite anticipated source of funds may request the deferment of up to 50% of the total charges at registration. The deferred payment may be divided into two equal payments with the second payment due on the 45th (July 11, 2008) day of the semester. All financial aid monies must be applied to fees before a deferment will be considered. A deferred payment service fee of \$20.00 is assessed when any portion of tuition, fees, and other charges are deferred with the approval of the Business Office. An additional \$35.00 late payment charge will be assessed if the second installment is not paid on or before the due date. For more details, contact the Business Office.

## **Late Payment Fees**

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

## **TUITION/FEE POLICY FOR DROPPED COURSES OR WITHDRAWAL**

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

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

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

<b>DROP DATE</b>	<b>CHARGE</b>	<b>REFUND</b>
<b>June 2 – June 6</b>	<b>NO CHARGE</b>	<b>100%</b>
<b>July 7 – June 12</b>	<b>20% CHARGE</b>	<b>80%</b>
<b>June 13 – June 17</b>	<b>40% CHARGE</b>	<b>60%</b>
<b>June 18 – June 22</b>	<b>60% CHARGE</b>	<b>40%</b>
<b>June 23 - End of Term</b>	<b>100% CHARGE</b>	<b>NO REFUND</b>

## **TUITION/FEE REFUND POLICY FOR WITHDRAWALS**

Withdrawal from school for the term after registration has been processed, even though classes have not been attended or fees paid, must be by official notification to the Registrar's office. The effective date of withdrawal is the date the Registrar's office is notified by completion of the Change of Registration request form. **FAILURE TO ATTEND CLASS DOES NOT AUTOMATICALLY CANCEL ENROLLMENT.** The appropriate percentage of fees will be charged unless the Registrar's Office is notified by the close of the last day designated for registration and before the first official day of classes for the semester or term. **WITHDRAWAL DOES NOT CANCEL FEES AND CHARGES ALREADY INCURRED. THE DROP/ADD PROCEDURE CAN NOT BE USED TO WITHDRAW FROM SCHOOL FOR THE SEMESTER OR TERM.** When a course is canceled by UTSI administration, the students who have registered for the course will be notified by either the instructor and/or the Registrar's Office and required to file a Change of Registration form with the Registrar's Office, UTSI, Room A102, 393-7228.

The University of Tennessee Space Institute, in accordance with federal regulations, follows the policy and procedures below for calculating refunds and repayments for financial aid.

### **REFUNDS**

Refunds are defined as the portion of maintenance and/or tuition and University housing charges due as rebate when a student withdraws or is expelled from the University. The amount of a refund is determined by the Drop Date Charge fee table on the previous page.



## **REPAYMENTS**

Repayments are defined as that portion of aid, received by a student after the University direct charges have been paid by that aid that must be repaid by a student when a student withdraws or is expelled. The amount of the repayment is determined by the Drop Date Charge fee table on the previous page.

Refunds and repayments to the Title IV programs are determined according to the formula published in the current Federal Student Financial Aid Handbook. The Business and Admissions Offices are responsible for determining the amount of the refund and/or repayment and distributing the correct amount back to the financial aid programs according to the Refund/Repayment Allocation Policy.

## **WITHDRAWAL (TOTAL) 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 the Registrar's Office 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 <https://cpo.utk.edu/CPOWeb/> or by calling 865-656-2527. Grades will not be mailed unless a printed copy is requested through the web address. Students will be prompted to enter their ID number and their Personal Security Code. There is a limit of 8 telephone calls per student, per semester. Unlimited access is available via the Internet. Grades may also be obtained through the Registrar's Office at UTSI.

## **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 the Registrar's Office 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 DEADLINES 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 MAES 595 seminars or a PHYS 503 seminar each term, unless a waiver is granted by the Dean for Academic Affairs.

## **REMOVAL OF INCOMPLETE GRADES**

All Incomplete Grades (I) must be removed within one semester, excluding the Summer Term. If a supplementary grade report has not been received in the Registrar's Office at the end of the following semester, the I will be changed to an E. The course will not be counted in the cumulative grade point average until a final grade is assigned. Students wishing to graduate Summer Semester 2008 must remove all INCOMPLETE GRADES by August 7, 2008.

It is the responsibility of the student to contact the instructor and the instructor's responsibility to complete a Grade Change form. The Registrar's Office cannot change a grade on verbal instructions only.

### **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 to the Registrar's Office a completed and signed Application for Admission to Candidacy form at least one semester prior to receiving the degree.

Candidacy committee changes or course changes must be submitted to the Committee Chairman using a Change of Committee/Course for approval. This form is available in the UTSI Registrar's Office.

### **ADMISSION TO CANDIDACY**

#### **DOCTOR OF PHILOSOPHY DEGREE:**

A Doctoral Committee should be formed during the student's first year of doctoral study and submitted to the Registrar's Office for approval. The form is available in the UTSI Registrar's Office. Any changes to the doctoral committee (deletions or additions) must be done through the Registrar's Office. Each Ph.D. student is responsible for submitting to the Registrar's Office a completed Admission to Candidacy form signed by the Doctoral Committee at least one semester prior to receiving the degree. The Candidacy form must be approved by the UTK Graduate School before a student will be admitted to candidacy.

### **CONTINUOUS REGISTRATION OF DOCTORAL STUDENTS**

All doctoral students must be registered for doctoral dissertation research course 600 (minimum of 3 hrs.) on a continuous basis starting when the doctoral research proposal is approved, admission to candidacy is accepted, or registration for course 600 is begun, whichever comes first, including ALL Summer terms and the semester in which the dissertation is approved and accepted by The Graduate School. A leave of absence may be requested for extenuating circumstances. The procedure can be found in the UTK Graduate catalog.

### **FINAL EXAMINATION 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 the Registrar's Office. **Failure to notify the Registrar's Office 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 2008 academic year is provided by UnitedHealthcare. The premium must be paid before registration. Contact The Admission and Student Affairs Office (A104 ext. 432) for further information.

## **GENERAL SEMINAR**

A number of seminars of interest to all UTSI students and general public will be offered throughout the semester. Dr. John Steinhoff will be the coordinator. Please contact him at ext. 215 for information and times.

## **FINAL EXAM DATES FOR SUMMER SEMESTER 2008**

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

## **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 in the Registrar's Office, A102.

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

**THE UNIVERSITY OF TENNESSEE  
SPACE INSTITUTE  
SUMMER TERM 2008 COURSE LISTINGS**

**AEROSPACE ENGINEERING**

AE 422 AERODYNAMICS (3)

SEC. 001

TEXT: John D. Anderson, Jr.; Fundamentals of Aerodynamics; 4<sup>th</sup> Edition, 2005; McGraw Hill

TIME: Tuesday & Thursday 1:00 – 3:30 F253

PROFESSOR: Dr. Peter Solies

Introduction to fluid properties with emphasis on air. Theory of pressure and shear forces generated by air interacting with solid bodies. Potential flow theory for two- and three-dimensional flow, sources, sinks, vortices, circulation, aerodynamic lift; compressibility, shock and expansion waves, Mach number, wave drag; viscosity, boundary layers, friction drag. Design of aerodynamic bodies for desired characteristics, laminar and turbulent subsonic, transonic, and supersonic airfoils and surface contours.

AE 500 MASTER'S THESIS (3, 6, 9)

SEC. 001 Schulz

003 Antar

004 Flandro

005 Majdalani

006 Steinhoff

007 Vakili

012 Corda

013 Moeller

AE 502 REGISTRATION FOR USE OF FACILITIES (1-15)

SEC. 001 Schulz

AE 513 EXPERIMENTAL METHODS IN FLUID MECHANICS (3)

SEC. 001

TEXT: J. R. Goldstein: Fluid Mechanics Measurements; 2<sup>nd</sup> Ed; Taylor and Francis; ISBN# 1-56032-306-X

TIME: Tuesday & Friday 10:00-12:00 E210

PROFESSOR: Dr. Ahmad Vakili

Experimental techniques with lab experiments; representative experiments; hot wire anemometry and turbulence measurements, flow visualization, wind tunnel tests, water table experiments, supersonic flow experiments, boundary layer measurements, laser-optical measurements. Prereq: AE 423 or ME 531 or consent of instructor.

AE 532 INTRODUCTION TO TURBULENCE (3)  
SEC. 001 (Same as ME 599 Sec. 006)  
TIME: Tuesday & Friday 10:00 – 12:00 E211  
TEXT: H. Tennekes and J.L. Lumley; A First Course in Turbulence; MIT Press; Latest Ed.; ISBN# 0262200198  
PROFESSOR: Dr. Basil Antar

This is a first year graduate course in Turbulence. The following topics will be covered:

1. The origin of Turbulence
2. The nature of Turbulence
3. Turbulent transport of momentum and heat
4. The dynamics of Turbulence
5. Boundary free shear flows\
6. Wall bounded shear flows
7. Statistical description of Turbulence
8. Turbulent transport
9. Spectral dynamics

Prerequisites: AE, ES, ME 541, AE, ES, ME 542, or approval of instructor.

**\*AE 599 SPECIAL TOPICS IN AE: ENGINE INLET INTEGRATION (3) CANCELLED**  
SEC. 002

TEXT: Practical Intake Aerodynamic Design, El L. Goldsmith and J. J. Seddon; AIAA Education Series; ISBN-10: 1-56347-064-0, ISBN-13: 978-1-56347-064-6  
OPTIONAL TEXT: Intake Aerodynamics; 2<sup>nd</sup> Ed.; J.J. Seddon and E. L. Goldsmith; AIAA Education Series, ISBN-10: 1-56347-361-5, ISBN-13: 978-1-56347-361-6.  
TIME: Tuesday & Friday 10:00 – 12:00 B112  
PROFESSOR: Dr. Donald J. Malloy

This course will cover fundamental theories, ground and flight test techniques, and data collection and analyses for engine inlet performance and operability. Engine inlet compatibility and integration are addressed for missiles with air-breathing engines, strike and fighter aircraft, and short takeoff and vertical landing aircraft. Topics will include aerodynamic modeling, viscous effects, operational characteristics, performance estimation, installation effects, variable geometry, stability margin loss estimation due to pressure and temperature distortion, and proof of capability.

AE 599 SPECIAL TOPICS IN AE: HYPERSONIC AIR BREATHING  
PROPULSION (3)

SEC. 003  
TEXT: Hypersonic Air Breathing Propulsion; W.H. Heiser and D.T. Pratt; AIAA Education Series, 1994.  
TIME: Monday & Thursday 10:00 – 12:00 E211  
PROFESSOR: Dr. Gary Flandro

The fundamentals of hypersonic flight vehicle air breathing propulsion will be reviewed. Propulsion systems discussed will be ramjet, scramjet and combined cycle systems such as turbine-based combined cycle and rocket-based combined cycle engines. Cycle performance studies will be made using the software included with the course textbook.

AE 600 DOCTORAL & RESEARCH DISSERTATION (3, 6, 9)  
SEC. 001 Schulz  
003 Antar  
004 Flandro  
005 Majdalani  
006 Steinhoff  
007 Vakili

### AVIATION SYSTEMS

AS 500 MASTER'S THESIS (1 - 15)

SEC. 001 Corda  
003 Collins  
004 Ranaudo  
005 Solies  
006 Muratore  
007 Pujol

AS 502 REGISTRATION FOR USE OF FACILITIES (1-15)

SEC. 001 Corda  
002 Solies  
003 Ranaudo  
004 Muratore  
005 Pujol  
006 Collins

AS 507 INTRODUCTION TO AIRBORNE RADAR (3)

SEC. 001

TEXT: George W. Stimson; Introduction to Airborne Radar; Latest Edition; Scitech Publishing, Inc.; ISBN# 1-891121-01-4.

TIME: Tuesday & Friday 10:00 – 12:00 E113

PROFESSOR: Dr. Alfonso Pujol

The course covers pulse compression, FM ranging, Pulse Doppler Radar including Doppler effects, spectrum of pulsed signal, sensing Doppler frequencies, how digital filters work, the digital filter bank and the FFT, and measuring range rate. Return Radar from the ground (scatter) including sources and spectra of ground return, effect of range and Doppler ambiguities on ground clutter, and separating ground-moving targets from clutter are also covered.

AS 510 FLIGHT TEST DATA PROCESSING (3)

SEC. 001

TEXT: LabVIEW Programming, Data Acquisition and Analysis; Jeffrey Y. Beyon; Prentice Hall PTR, First Edition; ISBN# 0-133-030367-4.

TIME: Monday & Thursday 10:00 – 12:00 E113

PROFESSOR: John Muratore

This course will introduce the student to the typical data processing techniques and issues unique to a flight test. The course will discuss the unique nature of flight test data sources (telemetry, recordings, military and commercial databus formats, audio and video formats) and unique processing algorithms to deal with these formats. The course will discuss data compression and processing algorithms typically used in real time as well as postflight data

reduction. The course will discuss techniques for reducing noise in flight test data such as digital filtering and wildpoint elimination, techniques for performing statistical analysis of flight data such as regression analysis and techniques for analyzing flight test data in the time and frequency domain (fourier and spectral analysis). The course will discuss the problems associated with planning for flight test data reduction including problems in managing databases and building data simulators for flight test data processing operations and validation. Special topics such as data archiving and flight visualization will also be discussed. The course will make extensive use of LabVIEW and MATLAB and the students will be expected to program and test algorithms in these languages. Excel will also be used.

**This will be videotaped and available to distance learning as well as resident students.**

**\*AS 510 SPECIAL TOPICS: ATMOSPHERIC SCIENCE (3) CANCELLED**  
SEC. 002

TEXT: Atmospheric Science: An Introductory Survey; John M. Wallace and Peter V. Hobbs;  
Academic Press; Second Edition; ISBN# 0127329512.

TIME: Tuesday & Friday 1:00 – 2:30 E113

PROFESSOR: Dr. Basil Antar

This is a first year graduate level course in Atmospheric Science. A prerequisite requirement for taking this course is the completion of an undergraduate degree in Physics, Chemistry or Engineering. The course will cover major topics related to atmospheric Science including the following:

1. A brief Survey of the Atmosphere
2. The Earth System: The hydrologic cycle; The Carbon cycle; Oxygen in the Earth system and; History of Climate.
3. Atmospheric Thermodynamics
4. Radiative Transfer
5. Atmospheric Chemistry
6. Cloud Microphysics
7. Atmospheric Dynamics

AS 550 PROJECT IN AVIATION SYSTEMS (3)

SEC. 001 Corda

003 Collins

004 Ranaudo

005 Muratore

006 Solies

Enrollment limited to Aviation Systems students in non-thesis program. May be repeated. Maximum 3 hours allowed toward degree.

### **CHEMICAL ENGINEERING**

ChemE 500 MASTER'S THESIS (3, 6, 9)

SEC. 002 Sheth

**\*ChemE 547 SPECIAL TOPICS IN ME: INTRODUCTION TO TRANSPORT THEORY (3) CANCELLED**

SEC. 001

TEXT: Transport Phenomena; R.B. Bird, W.E. Stewart and E.N. Lightfoot; John Wiley &

Sons, 2002; Second Edition or later; ISBN# 0-471-41077-2.

TIME: Tuesday & Friday 1:00 – 3:00 E211

PROFESSOR: Dr. Roy Schulz

This course is an introduction to transport phenomena, overviewing the phenomena of heat, mass and momentum transport in fluids. The statistical-mechanical basis for viscosity, thermal conductivity and mass diffusion in fluids is covered. Unified treatment of momentum, heat and mass transfer in boundary layers is presented.

### **COMPUTER SCIENCE**

**NOTE:** Students interested in the Interdisciplinary Graduate Minor in Computational Science (IGMCS) at UTSI should contact Dr. Bruce Whitehead ([bwhitehe@utsi.edu](mailto:bwhitehe@utsi.edu), 931-393-7296) for further information.

**\*MATH 571 NUMERICAL MATHEMATICS I (3) CANCELLED**

SEC. 001

TEXT: TBA

TIME: Monday & Thursday 3:15 – 5:15 B210

PROFESSOR: Dr. K. C. Reddy

Direct and iterative methods for linear systems. The algebraic eigenvalue problem and the singular decomposition theorem. Newton and quasi-Newton methods for systems of nonlinear equations. Numerical techniques for initial value problems of ordinary differential equations. Numerical techniques for initial value problems of ordinary differential equations. Two-point boundary value problems. Finite difference and finite element methods for selected partial differential equations. Fast Poisson solvers. (Same as Computer Science 571). Prereqs: 445, 446, 453, 471 and 472.

### **ELECTRICAL and COMPUTER ENGINEERING**

ECE 500 MASTER'S THESIS (3, 6, or 9)

SEC. 001 Bomar

026 Smith

027 Whitehead

028 Pujol

ECE 501 PROJECT IN LIEU OF THESIS (3)

SEC. 001 Bomar

008 Smith

010 Pujol

011 Whitehead

ECE 502 REGISTRATION FOR USE OF FACILITIES

SEC. 004 Bomar

005 Smith

006 Pujol

008 Whitehead



## **ENGINEERING SCIENCE**

ES	500	MASTER'S THESIS (3, 6, or 9)
SEC.	001	Schulz
	003	Flandro
	004	Majdalani
	005	Steinhoff
	006	Vakili
	014	Antar
ES	502	Use of Facilities
SEC.	002	Dr. Ahmad Vakili
ES	600	DOCTORAL AND RESEARCH DISSERTATION (3, 6, 9)
SEC.	001	Schulz
	003	Flandro
	004	Majdalani
	005	Steinhoff
	006	Vakili
	011	Antar

## **ENGINEERING MANAGEMENT:**

EM	501	CAPSTONE PROJECT IN ENGINEERING MANAGEMENT (3)
SEC.	001	UTSI On Campus Students Use This Number
SEC.	002	UTSI Off Campus Students

Application-oriented project to show competence in major academic area. Enrollment limited to Engineering Management students in non-thesis program. May be repeated. Maximum 6 hours.

EM	502	REGISTRATION FOR USE OF FACILITIES for EM STUDENTS (3)
SEC.	001	UTSI On Campus Students Use this Number
SEC.	002	UTSI Off Campus Students

Required for the student not otherwise registered during any semester when student uses University facilities and /or faculty time before a degree in Industrial Engineering (Engineering Management) is completed. May not be used toward degree requirements.

EM	536	PROJECT MANAGEMENT (3)
SEC.	001	On Campus UTSI Students (This is an Interactive Course)
SEC.	002	(UTSI Off Campus Students receiving tapes/CD/interactive use this number)
TEXT:	Harold Kerzner: <u>Project Management: A System Approach to Planning, Scheduling, and Controlling</u> ; John Wiley; 8 <sup>th</sup> Ed; ISBN# 047122577-0	
TIME:	Tuesday & Thursday	4:00 – 6:35 E113
PROFESSOR:	Dr. Denise Jackson	

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

EM 542 DESIGN OF EXPERIMENTS FOR ENGINEERING MANAGERS (3)  
SEC. 001 UTSI on Campus Students (This is an Interactive Course)  
SEC. 002 UTSI off Campus Students receiving tapes/CD/interactive use this number  
TEXT: TBD  
TIME: Monday & Wednesday 4:00 – 6:35 E113  
PROFESSOR: Dr. Greg Sedrick

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. (DE) Prerequisite(s): Industrial Engineering 516.

EM 543 LEGAL AND ETHICAL ASPECTS OF ENGINEERING MANAGEMENT (3)  
SEC. 001 UTSI on Campus Students (This is an Interactive Course)  
SEC. 002 UTSI off Campus Students receiving tapes/CD/interactive use this number  
TEXT: TBD  
TIME: Monday & Wednesday 4:30 – 7:00 E112  
PROFESSOR: Dr. Frank W. Steinle, Jr.

Legal aspects imposed by government and ethical considerations in engineering practice. Selected readings, lecture, discussion, and student presentations. Current topics from government and industry.

### **INDUSTRIAL ENGINEERING**

IE 691 ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)  
SEC. 001  
PROFESSOR: Dr. Gregory Sedrick

IE 693 ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)  
SEC. 004 Sedrick  
005 Jackson

### **MATERIALS SCIENCE & ENGINEERING**

\*MSE 472 FUNDAMENTAL PRINCIPLES OF COMPOSITE MATERIALS (3)  
**CANCELLED**  
SEC. 005  
TEXT: TBD  
TIME: Monday & Thursday 10:00 – 12:00 F252  
PROFESSOR: Dr. Zhongren Yue

Physical principles basic to the design, manufacture and application of fiber reinforced polymers, metals and ceramics.

MSE 500 MASTER'S THESIS (3, 6 or 9)  
SEC. 002 Hofmeister

MSE 600 DISSERTATION AND RESEARCH (3, 6, or 9)  
SEC. 002 Hofmeister

## MATHEMATICS

MATH 443 COMPLEX VARIABLES (3)

SEC. 001 Recorded from UTSI

TEXT: M. Spiegel: Complex Variables Schaum's Outline; Mc-Graw Hill; 29<sup>th</sup> Ed.; ISBN#07-060230-1

TIME: Monday & Thursday 1:30 – 3:30 E113

PROFESSOR: Dr. Horace Crater

Theory of functions of complex variable (arithmetic, algebra, and trigonometry); complex differentiation and analytic functions with applications to solutions of Laplace equations; complex integration, residue theory and contour integrals with applications to Fourier and Laplace transforms, Fourier Series, and the summation of infinite series; conformal mapping and applications to solving boundary value problems in physics and engineering including applications to fluid and heat flows and electrostatics.

MATH 500 MASTER'S THESIS (3, 6, 9)

SEC. 001 Kupershmidt

\*MATH 571 NUMERICAL MATHEMATICS (3) **CANCELLED**

SEC. 001

TEXT: TBD

TIME: Monday & Thursday 3:15 – 5:15 B210

PROFESSOR: Dr. K. C. Reddy

Direct and iterative methods for linear systems. The algebraic eigenvalue problem and the singular decomposition theorem. Newton and quasi-Newton methods for systems of nonlinear equations. Numerical techniques for initial value problems of ordinary differential equations. Numerical techniques for initial value problems of ordinary differential equations. Two-point boundary value problems. Finite difference and finite element methods for selected partial differential equations. Fast Poisson solvers. (Same as Computer Science 571). Prereqs: 445, 446, 453, 471 and 472.

MATH 578 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS (3)

SEC. 001

TEXT: Survey of Computational Physics; Rubin Landau; Princeton, (to appear in Summer 2008); Numerical Recipes; 3<sup>rd</sup> Edition (online version January 2008); and selected other references and example codes, including references to computer languages such as FORTRAN, C, C++, Java, and/or implementations of software packages/libraries.

TIME: Monday & Thursday 1:00-3:00 F252

PROFESSOR: 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. The course will also address PDE's with nonlinear and dispersive effects, and schemata implementations on various platforms including clustered computers for parallel processing.

Prereq: 435 or 512 or 515, Fortran or C or C++ or JAVA, or consent of instructor.

**NOTE:** This course counts for the new interdisciplinary minor in CS as well.

## **MECHANICAL ENGINEERING**

ME 500 MASTER'S THESIS (3, 6, 9)

SEC. 001 Schulz

003 Flandro

004 Majdalani

005 Steinhoff

006 Vakili

025 Antar

026 Moeller

ME 587 DYNAMIC MODELING AND SIMULATION (3)  
SEC. 001  
TEXT: TBD  
TIME: Tuesday & Friday 1:00 – 3:00 B113  
PROFESSOR: Dr. Ken Kimble

Modeling and analysis of physical systems. Systems and parameter identification. Mathematical modeling methods and approximations. Digital simulation techniques and practices. Design and control applications. (Same as Biomedical Engineering 587).

ME 590 SELECTED ENGINEERING PROBLEMS (2-6)  
SEC. 001  
PROFESSOR: Dr. Roy Schulz

\*ME 599 SPECIAL TOPICS IN MECHANICAL ENGINEERING (3) **CANCELLED**  
SEC. 004  
TEXT: R.W. Haywood; Engineering Power Cycles ; 4<sup>th</sup> Ed. or later; Pergamon Press;  
ISBN# 0-08-040738  
TIME: Tuesday & Friday 10:00 – 12:00 F252  
PROFESSOR: Dr. Roy Schulz

Course covers the fundamentals of gas, steam and nuclear power cycles, both ideal and real.

\*ME 599 SPECIAL TOPICS IN ME: ENGINE INLET INTEGRATION (3)  
**CANCELLED**  
SEC. 003  
TEXT: Practical Intake Aerodynamic Design, El L. Goldsmith and J. J. Seddon; AIAA Education Series; ISBN-10: 1-56347-064-0, ISBN-13: 978-1-56347-064-6  
OPTIONAL TEXT: Intake Aerodynamics; 2<sup>nd</sup> Ed.; J.J. Seddon and E. L. Goldsmith; AIAA Education Series, ISBN-10: 1-56347-361-5, ISBN-13: 978-1-56347-361-6.  
TIME: Tuesday & Friday 10:00 – 12:00 B112  
PROFESSOR: Dr. Donald J. Malloy

This course will cover fundamental theories, ground and flight test techniques, and data collection and analyses for engine inlet performance and operability. Engine inlet compatibility and integration are addressed for missiles with air-breathing engines, strike and fighter aircraft, and short takeoff and vertical landing aircraft. Topics will include aerodynamic modeling, viscous effects, operational characteristics, performance estimation, installation effects, variable geometry, stability margin loss estimation due to pressure and temperature distortion, and proof of capability.

ME 599 SPECIAL TOPICS: THEORY OF TURBULENCE (3)  
SEC. 006 (Same as AE 532 Sec. 001)  
TIME: Tuesday & Friday 10:00 – 12:00 E211  
TEXT: H. Tennekes and J.L. Lumley; A First Course in Turbulence; MIT Press; Latest Ed.; ISBN# 0262200198  
PROFESSOR: Dr. Basil Antar

This is a first year graduate course in Turbulence. The following topics will be covered:

1. The origin of Turbulence
2. The nature of Turbulence
3. Turbulent transport of momentum and heat
4. The dynamics of Turbulence
5. Boundary free shear flows\

6. Wall bounded shear flows
7. Statistical description of Turbulence
8. Turbulent transport
9. Spectral dynamics

Prerequisites: AE, ES, ME 541, AE, ES, ME 542, or approval of instructor.

ME 599 SPECIAL TOPICS IN ME: HYPERSONIC AIR BREATHING  
PROPULSION (3)

SEC. 007

TEXT: Hypersonic Air Breathing Propulsion; W.H. Heiser and D.T. Pratt; AIAA Education Series, 1994.

TIME: Monday & Thursday 10:00 – 12:00 E211

PROFESSOR: Dr. Gary Flandro

The fundamentals of hypersonic flight vehicle air breathing propulsion will be reviewed. Propulsion systems discussed will be ramjet, scramjet and combined cycle systems such as turbine-based combined cycle and rocket-based combined cycle engines. Cycle performance studies will be made using the software included with the course textbook.

\*ME 599 SPECIAL TOPICS IN ME: INTRODUCTION TO TRANSPORT THEORY  
**CANCELLED**

SEC. 008

TEXT: Transport Phenomena; R.B. Bird, W.E. Stewart and E.N. Lightfoot; John Wiley & Sons, 2002; Second Edition or later; ISBN# 0-471-41077-2.

TIME: Monday & Thursday 3:15 – 5:15 E211

PROFESSOR: Dr. Roy Schulz

This course is an introduction to transport phenomena, overviewing the phenomena of heat, mass and momentum transport in fluids. The statistical-mechanical basis for viscosity, thermal conductivity and mass diffusion in fluids is covered. Unified treatment of momentum, heat and mass transfer in boundary layers is presented. This course is on the fundamental courses in the Chemical Engineering curricula and may be taken/cross-listed as ChemE 547 Transport Phenomena I.

\*ME 599 SPECIAL TOPICS IN ME: GAS TURBINE ENGINE MODELING AND  
SIMULATION TECHNIQUES (3) **CANCELLED**

SEC. 009

TEXT: Elements of Gas Turbine Engine Propulsion; J. Mattingly, ISBN# 1-56347-778-5;

TIME: Tuesday & Thursday 4:00 – 5:30 E112

PROFESSOR: Dr. Milt Davis

This course will concentrate on numerical simulation of gas turbine engines and their components. The student will be exposed to gas turbine simulation technology for engine performance – how a cycle code is constructed, what assumptions are inherent in cycle codes, and how cycle codes are typically used in design, testing and evaluation and by the end user. A majority of the course will deal with engine cycle codes such as PERF, PARA, GASTURB and GECAT will be studied and utilized. Students will be exposed to compression system codes for both performance and operability issues. Students will be expected to become proficient in the use of cycle codes and the interpretation of the results.

**Material to be Covered:**

- Gas Turbine Engine Cycle Analysis
  - Design Considerations
  - Steady State
  - Transient
  - Dynamic
- Compressor Analysis
  - Meanline Analysis
  - 2D Techniques
  - Dynamic Techniques for Stall/Surge
  - Parallel Compressor Theory
  - 3D Techniques
- Intro to CFD Turbomachinery

ME 600 DISSERTATION & RESEARCH (3, 6, or 9)  
SEC. 001 Schulz  
003 Flandro  
004 Majdalani  
005 Steinhoff  
006 Vakili  
021 Antar

**PHYSICS**

PHYS 500 MASTER'S THESIS (3, 6, or 9)  
SEC. 001 Crater  
003 Davis  
004 Parigger  
005 Chen  
006 Lewis

PHYS 593 INDEPENDENT STUDY (3)  
SEC. 001  
TEXT: To Be Selected  
TIME: Monday & Thursday 10:00 - 12:00 B210  
PROFESSOR: Dr. Horace Crater

This course will cover a variety of materials not normally offered in the academic year and will be tailored to individual student needs. Included would be a self-paced course involving intermediate level topics in classical physics, advanced topics in quantum theory, and preparation for the physics preliminary exam.

PHYS 600 DISSERTATION (3, 6, or 9)  
SEC. 001 Crater  
003 Davis  
004 Parigger  
005 Chen  
006 Lewis

PHYS 605 ADVANCED TOPICS: LASER SPECTROSCOPY (3)  
SEC. 001

TEXT: Classic books, on-line references, lecture and lab notes: (1) several textbooks will be used to review classical laser spectroscopy: "Laser Spectroscopy," Demtröder; "Atomic and Laser Spectroscopy," Corney; "Introduction to Nonlinear Laser Spectroscopy," Levenson; "Aux Frontieres de la Spectroscopie Laser," Les Houches, Vol. 1, 2 ed. Balian, Haroche, Liberman; "Laser Spectroscopy," ed. Brewer, Mooradian, "Physics Reports: High resolution spectroscopy with lasers," Demtröder; (2) current topics by use of on-line journals, including "Applied spectroscopy," "Journal of quantitative spectroscopy & radiative transfer," "Optics and spectroscopy," "Spectrochimica Acta Part A: Molecular Spectroscopy," "Spectrochimica acta. Part A (Molecular and biomolecular spectroscopy) and B (Atomic spectroscopy)," "Journal of Physics B, Atomic, molecular and optical physics," "Review of Modern Physics," e.g. "Laser Spectroscopy and Quantum Optics," Hänsch and Walther, OSA publications, and PROLA (Physical Review Online Archive) [http://prola.aps.org\\_](http://prola.aps.org_); (3) selected lecture notes and laboratory notes.

TIME: Tuesday & Friday 1:00 – 3:00 CLA Laboratories

PROFESSOR: 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. Prereq: 521, 541.



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# Summer 2008 Registration Announcement

SUMMER 08

Graduate Education

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The **FUTURE** is bright at UTSI