

# Summer 2010



THE UNIVERSITY of TENNESSEE   
SPACE INSTITUTE

411 B.H. Goethert Parkway  
Tullahoma, TN 37388-9700  
888-822-8874 x-37228  
[www.utsi.edu](http://www.utsi.edu)

*See Inside for Online Registration Instructions*  
<https://cpo.utk.edu/CPOWeb>

R  
E  
G  
I  
S  
T  
R  
A  
T  
I  
O  
N  
  
A  
N  
N  
O  
U  
N  
C  
E  
M  
E  
N  
T

## TABLE OF CONTENTS

Calendar for Summer Semester 2010 .....	2
Final Exam schedule Summer 2010.....	3
Registration.....	4
Financial Calendar .....	5
Credit Card Payments .....	5
Special Billing/Third-party Billing .....	5
Bookstore Hours .....	6
Application for Admission.....	6
Fees .....	6-7
Late Registration Fees.....	7
Fees for Change of Registration/Dropped Courses/Withdrawal.....	8
Full Time Student Hours.....	9
Removal of “Incomplete” Grade .....	9
Admission to Candidacy (MS and PhD).....	10
Non-Thesis/Thesis/Dissertation Final Exams.....	10
Insurance for International Students .....	11
Honor Statement .....	11
Summer Semester 2010 Course Listings & Descriptions.....	12-20

**CALENDAR  
SUMMER SEMESTER 2010**

Registration.....	March 1, 2010 – May 25, 2010
Submit Admission to Candidacy Forms Summer 2010 Graduation.....	April 30, 2010
Submit Graduation Application .....	April 30, 2010
Late Registration and late fees begin .....	May 26, 2010 – June 11, 2010
Memorial Day (Holiday).....	May 31, 2010
Classes begin.....	June 3, 2010
Last Day to drop without “W” on the transcript, change to/from audit, add a course without the instructor’s signature.....	June 11, 2010
Pay Graduation Fee.....	June 25, 2010
Last day to add/change credit with signatures .....	June 29, 2010
Preliminary/Thesis/Dissertation Review Deadline .....	June 25, 2010
Independence Day Holiday.....	July 5, 2010
Last day to schedule final exam (thesis) .....	July 9, 2010
Last day to schedule final exam (non-thesis/capstone students).....	July 9, 2010
Last day to schedule final exam (dissertation).....	July 16, 2010
Last day to defend thesis.....	July 23, 2010
Last day to take final exam (non-thesis/capstone students).....	July 23, 2010
Last day to defend dissertation .....	July 23, 2010
Drop with a “W” .....	July 23, 2010
Final paper or electronic thesis/dissertation must be approved and accepted in Knoxville By (5:00 P.M. EST) .....	August 6, 2010
Submit Pass/Fail form to UTSI Registrar’s Office .....	August 6, 2010
Deadline for submission of Admission to Candidacy for students graduating Fall 2010 .....	August 10, 2010
Deadline for removing "INCOMPLETE" grades .....	August 10, 2010
Classes End.....	August 10, 2010
Withdraw from all classes.....	August 10, 2010
Exam Period (Exams are given during the regularly scheduled class meeting times.) Second thesis/dissertation deadline (Student will receive diploma December 2010 but do not have to register for Fall 2010) (Defense completed by August 10)...	August 17, 2010
No Graduate Hooding or Summer Commencement – Graduation Date.....	August 14, 2010

**FALL SEMESTER 2010**

Priority Registration for FALL Semester 2010 on CPO.....	March 15, 2010
Late Registration.....	August 12, 2010
Classes begin.....	August 18, 2010
Labor Day (Holiday).....	September 6, 2010
Fall Break.....	October 7 & 8, 2010
Thanksgiving Break .....	November 25 & 26, 2010
Classes End.....	November 30, 2010
Study Period.....	December 1, 4, 5, 2010
Exam Period.....	December 2, 3, 6, 7, 2010
Doctoral Hooding Ceremony (UTK).....	December 10, 2010
Commencement (UTK) .....	December 11, 2010

**SUMMER SEMESTER 2010**

**FINAL STUDY DAY AND EXAM SCHEDULE**

LAST DAY OF CLASSES.....August 10, 2010

FINAL EXAMS FOR SUMMER ARE GIVEN DURING THE REGULARLY SCHEDULED CLASS MEETING TIMES LISTED BELOW:

Monday, Thursday and Tuesday, Friday

7:45 – 9:45  
10:00 – 12:00  
1:00 – 3:00  
3:15 – 5:15

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

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

**REGISTRATION ANNOUNCEMENT  
SUMMER SEMESTER 2010**

**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 1, 2010 – May 25, 2010. Late registration will be May 26, 2010 – June 11, 2010. Classes begin June 3, 2010.

**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 15, 2010</b>
<b>Statement Information Available in Bursar Areas or at CPO.UTK.EDU</b>	<b>May 17, 2010</b>
<b>Priority Registration Payment/Confirmation Deadline (3:30 pm CDT)</b>	<b>May 25, 2010</b>
<b>Late Registration/Late Fees Begin</b>	<b>May 26, 2010</b>
<b>Late Registration Payment/Confirmation Deadline (3:30 pm CDT)</b>	<b>June 11, 2010</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. 37297 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)-37293</b>
<b>Bookstore:</b>	<b>1-888-822-UTSI (8874)-37204</b>
<b>Business Office:</b>	<b>1-888-822-UTSI (8874)-37204</b>
<b>Registrar's Office:</b>	<b>1-888-822-UTSI (8874)-37228</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. 37204 or 37314 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]. Students may send Application for Admission, transcripts, GRE scores (if required); and if international application, TOEFL scores to the Admissions Office, E-109, Mail Stop 19, UTSI, Tullahoma, TN 37388-9700.

## **PAYMENT OF FEES**

Payment of fees is due at time of registration. Late fees will begin on May 26, 2010. 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.

Aviation Systems	Stephen Corda	931-393-7413	<a href="mailto:scorda@utsi.edu">scorda@utsi.edu</a>
Engineering Mgt.	Dee Merriman	931-393-7293	<a href="mailto:dmerrima@utsi.edu">dmerrima@utsi.edu</a>

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

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

Maintenance Fee .....	\$3,413.00 *
Programs and Services Fee .....	75.00
<b>Total .....</b>	<b>\$3,488.00</b>

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

Maintenance Fee .....	\$3,413.00*
Programs and Services Fee .....	75.00
Tuition .....	6,898.00
<b>Total .....</b>	<b>\$10,386.00</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>\$380.00 per semester hour</b>
<b>3 hrs.</b>	<b>\$1,140.00</b>
<b>OUT-OF-STATE</b>	<b>\$1,147.00 per semester hour</b>
<b>3 hrs.</b>	<b>\$3,441.00</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 14, 2010) 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 3 – June 7</b>	<b>NO CHARGE</b>	<b>100%</b>
<b>July 8 – June 13</b>	<b>20% CHARGE</b>	<b>80%</b>
<b>June 14 – June 18</b>	<b>40% CHARGE</b>	<b>60%</b>
<b>June 19 – June 23</b>	<b>60% CHARGE</b>	<b>40%</b>
<b>June 24 - 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 D-100, 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 2010 must remove all INCOMPLETE GRADES by August 10, 2010.

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 2010 academic year is provided by United Healthcare. The premium must be paid before registration. Contact the Human Resources Department (C-104, ext. 37267) for further information.

### **GENERAL SEMINAR**

A number of seminars of interest to all UTSI students and general public will be offered throughout the semester. Dr. Ahmad Vakili will be the coordinator. Please contact him at ext. 37300 for information and times.

### **FINAL EXAM DATES FOR SUMMER SEMESTER 2010**

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, D-100.

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 2010 SEMESTER COURSE LISTINGS**

**AEROSPACE ENGINEERING**

AE 422 AERODYNAMICS (3)

SEC. 002 (Video Recorded)

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

TIME: Tuesday & Thursday 1:00 – 3:30 E111

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

012 Corda

013 Moeller

015 Vakili

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

SEC. 001 Antar

AE 532 INTRODUCTION TO TURBULENCE (3)

SEC. 001 (Same as ME 599 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.

AE 590 SELECTED ENGINEERING PROBLEMS (2-6)

SEC. 001 PROFESSOR: Dr. Ahmad Vakili

SEC. 002 PROFESSOR: Dr. Milton Davis

SEC. 003 PROFESSOR: Dr. Monty Smith

AE 600 DOCTORAL & RESEARCH DISSERTATION (3, 6, 9)

SEC. 003 Antar

004 Flandro

005 Majdalani

006 Steinhoff

### **AVIATION SYSTEMS**

AS 500 MASTER'S THESIS (1 - 15)

SEC. 001 Corda

002 Collins

003 Martos

004 Muratore

005 Pujol

006 Solies

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

SEC. 001 Corda

002 Collins

003 Martos

004 Muratore

005 Pujol

006 Solies

AS 507 INTRODUCTION TO AIRBORNE RADAR (3)

SEC. 001 (Video Recorded)

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

TIME: Tuesday & Friday 10:15 – 12:00 E113

PROFESSOR: Dr. Alfonso Pujol

Overview of Airborne Radar including basic concepts, approaches to implementation and representative applications. Essential student groundwork covering radio waves and alternating current signals. Radar fundamentals, including choice of radio frequency, directivity and the antenna beam, pulsed operation, detection range, the Range Equation and what it does and doesn't tell us. Pulse delay ranging is also covered.

AS 510 FLIGHT TEST DATA PROCESSING (3)

SEC. 001 (Video Recorded)

TEXT: Class Notes

TIME: Monday & Thursday 10:15 – 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)

SEC. 002 (Video Recorded)

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

TIME: Tuesday & Friday 1:00 – 3:00 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

002 Collins

003 Martos

004 Muratore

005 Pujol

006 Solies

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

## **BIOMEDICAL ENGINEERING**

BE 587 DYNAMIC MODELING AND SIMULATION (3)  
SEC. 001 (Interactive Video) (Same as ME 587).  
TEXT: TBD  
TIME: Wednesday & Friday 1:00 – 3:00 E111  
PROFESSOR: Dr. Kenneth 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.

## **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.

CS 572 NUMERICAL MATHEMATICS II (3)  
SEC. 004 (Interactive Video) (Same as Math 572)  
TEXT: TBD  
TIME: Monday & Wednesday 10:00 – 12:00 E111  
PROFESSOR: Dr. Christian Parigger

Numerical techniques for initial value problems of ordinary differential equations. Two-point boundary value problems. Finite difference and finite element methods for selected partial differential equations. Fast Poisson solvers. (*Same as Computer Science 572.*) (DE)  
*Prerequisite(s): 571.*

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

## **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. 002 Bomar  
003 Smith  
004 Pujol  
005 Whitehead

ECE 600 DOCTORAL & RESEARCH DISSERTATION (3-15)  
SEC. 028 Bomar

**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. 004 Majdalani  
005 Steinhoff  
006 Vakili  
011 Antar

**ENGINEERING MANAGEMENT:**

EM 501 CAPSTONE PROJECT IN ENGINEERING MANAGEMENT (3-6)  
SEC. 001 Dr. Gregory Sedrick  
SEC. 002 Dr. Denise Jackson

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 (1-15)  
SEC. 001 Dr. Gregory Sedrick  
SEC. 002 Dr. Denise Jackson

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 UTSI Students participating at Tullahoma or Oak Ridge  
SEC. 002 UTSI Students participating elsewhere  
SEC. 003 UTK Students participating at Knoxville DE Classrooms  
SEC. 004 UTK Students participating elsewhere  
TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)  
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 Students Participating at Tullahoma or Oak Ridge

SEC. 002 UTSI Students Participating elsewhere

SEC. 003 UTK Students participating at Knoxville DE Classrooms

SEC. 004 UTK Students participating elsewhere

TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)

TIME: Monday & Wednesday 4:00 – 6:35 E113

PROFESSOR: Dr. Alberto Garcia

Methodology for experiments in product, service, and process improvements. Factorial experiments, screening designs, variance reduction, and other selected topics for engineering managers. Taguchi philosophy and concepts. Optimization and response surface methods. Case studies. *(DE) Prerequisite(s): Industrial Engineering 516.*

EM 543 LEGAL AND ETHICAL ASPECTS OF ENGINEERING MANAGEMENT (3)

SEC. 001 UTSI Students Participating at Tullahoma or Oak Ridge

SEC. 002 UTSI Students Participating elsewhere

SEC. 003 UTK Students participating at Knoxville DE Classrooms

SEC. 004 UTK Students participating elsewhere

TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)

TIME: Monday & Wednesday 4:30 – 7:00 E111

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 500 MASTER'S THESIS (1-15)

SEC. 005 Dr. Gregory Sedrick

SEC. 008 Dr. Denise Jackson

### **MATERIALS SCIENCE & ENGINEERING**

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 (Video Recorded)  
TEXT: M. Spiegel: Complex Variables Schaum's Outline; Mc-Graw Hill; 29<sup>th</sup> Ed;  
ISBN# 07-060230-1  
TIME: Monday & Thursday 1:00 – 3:00 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 572 NUMERICAL MATHEMATICS II (3)  
SEC. 004 (Interactive Video) (Same as CS 572)  
TEXT: TBD  
TIME: Monday & Wednesday 10:00 – 12:00 E111  
PROFESSOR: Dr. Christian Parigger

Numerical techniques for initial value problems of ordinary differential equations. Two-point boundary value problems. Finite difference and finite element methods for selected partial differential equations. Fast Poisson solvers. (*Same as Computer Science 572.*) (DE)  
*Prerequisite(s): 571.*

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

## MECHANICAL ENGINEERING

ME 500 MASTER'S THESIS (3, 6, 9)  
SEC. 004 Majdalani  
005 Steinhoff  
006 Vakili  
025 Antar  
026 Moeller

ME 587 DYNAMIC MODELING AND SIMULATION (3)  
SEC. 001 (Interactive Video) (Same as BE 587).  
TEXT: TBD  
TIME: Wednesday & Friday 1:00 – 3:00 E111  
PROFESSOR: Dr. Kenneth 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.

ME 590 SPECIAL TOPICS IN MECHANICAL ENGINEERING (3)  
SEC. 001 Moeller

ME 590 SPECIAL TOPICS IN MECHANICAL ENGINEERING (3)  
SEC. 002 Milt Davis

ME 590 SPECIAL TOPICS IN MECHANICAL ENGINEERING (3)  
SEC. 003 Smith

ME 599 SPECIAL TOPICS: THEORY OF TURBULENCE (3)  
SEC. 001 (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 600 DISSERTATION & RESEARCH (3, 6, or 9)

SEC. 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 501 GRADUATE RESEARCH PARTICIPATION (3)

SEC. 002

TEXT: TBD

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

PROFESSOR: Dr. Lloyd Davis

Advanced research techniques under supervision of staff research director whose research area coincides with interests of student.

*(Grading Restriction: Satisfactory/No Credit grading only. Repeatability: May be repeated with consent of department. Maximum 18 hours. Comment(s): Open to all graduate students in good standing. Registration Permission: Consent of department and research director.)*

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. This summer we anticipate offering material in modern physics and introductory quantum mechanics. This will aid students who wish to take the core physics courses (521-22) in quantum mechanics. It will be tailored to the individual students' needs. Engineering students, including students in material science, are encouraged as well as students who wish to enter the physics program. Independently this course will serve those students preparing for the physics preliminary exam.

PHYS 600 DISSERTATION (3, 6, or 9)

SEC. 001 Crater

003 Davis

004 Parigger

005 Chen

006 Lewis

PHYS 605 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: Monday & Wednesday 1:00 – 3:00 F252

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.*