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411 B.H. Goethert Parkway
Tullahoma, TN 37388-9700
888-822-8874 x228
www.utsi.edu

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

CALENDAR
SUMMER SEMESTER 2009

Registration .... March 2 – May 26, 2009
Submit Admission to Candidacy Forms Summer 2009 Graduation .... April 24, 2009
Submit Graduation Application .... April 24, 2009
Late Registration and late fees begin .... May 27 – June 9, 2009
Memorial Day (Holiday) .... May 25, 2009
Classes begin .... June 1, 2009
Last Day to drop without "W" on the transcript, change to/from audit,
    add a course without the instructor's signature .... June 9, 2009
Pay Graduation Fee .... June 19, 2009
Last day to add/change credit with signatures .... June 25, 2009
Preliminary/Thesis/Dissertation Review Deadline .... June 26, 2009
Last day to schedule final exam (thesis) .... July 3, 2009
Independence Day Holiday .... July 3, 2009
Last day to schedule final exam (non-thesis/capstone students) .... July 3, 2009
Last day to schedule final exam (dissertation) .... July 10, 2009
Last day to take final exam (thesis/dissertation students) .... July 17, 2009
Last day to take final exam (non-thesis/capstone students) .... July 17, 2009
Last day to defend dissertation .... July 17, 2009
Drop with a "W" .... July 21, 2009
Final paper or electronic thesis/dissertation must be approved and accepted in Knoxville
    By (5:00 P.M. EST) .... July 31, 2009
Submit Pass/Fail form to UTSI Registrar's Office .... July 31, 2009
Deadline for submission of Admission to Candidacy for students
    graduating Fall 2009 .... August 6, 2009
Deadline for removing "INCOMPLETE" grades .... August 6, 2009
Classes End .... August 6, 2009
Withdraw from all classes .... August 6, 2009
Exam Period (Exams are given during the regularly scheduled class meeting times.)
Second thesis/dissertation deadline (Student will receive diploma December 2009
    but do not have to register for Fall 2009) (Defense completed by August 6) ..... August 14, 2009
No Graduate Hooding or Summer Commencement – Graduation Date .... August 14, 2009

FALL SEMESTER 2009

Priority Registration for FALL Semester 2009 on CPO .... March 9 – August 11, 2009
Late Registration .... August 12 – August 28, 2009
Classes begin .... August 19, 2009
Labor Day (Holiday) .... September 7, 2009
Fall Break .... October 15 & 16, 2009
Thanksgiving Break .... November 26 & 27, 2009
Classes End .... December 1, 2009
Study Period .... December 2, 5, & 6, 2009
Exam Period .... December 3, 4, 7, 8, 9 & 10, 2009
Doctoral Hooding Ceremony (UTK) .... December 11, 2009
Commencement (UTK) .... December 13, 2009

SUMMER SEMESTER 2009

FINAL STUDY DAY AND EXAM SCHEDULE

LAST DAY OF CLASSES...August 6, 2009

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 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 2, 2008 – May 26, 2008. Late registration will be May 27 - June 9, 2009. Classes begin June 1, 2009.

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

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

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. 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

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

Last Registration Day for Receiving Statements by Mail	**May 15, 2009**
Statement Information Available in Bursar Areas or at CPO.UTK.EDU	**May 4, 2009**
Priority Registration Payment/Confirmation Deadline (3:30 pm CDT)	**May 26, 2009**
Late Registration/Late Fees Begin	**May 27, 2009**
Late Registration Payment/Confirmation Deadline (3:30 pm CDT)	**June 9, 2009**

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 accessed 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. 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 297or by email **jboyles@utsi.edu**

TOLL-FREE NUMBER

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)-432**
Bookstore:	**1-888-822-UTSI (8874)-204**
Business Office:	**1-888-822-UTSI (8874)-204**
Registrar's Office:	**1-888-822-UTSI (8874)-228**

BOOKSTORE HOURS

The Bookstore is located in Lower C-Wing Business Office. The Bookstore hours are 8:00 a.m. - 4:00 p.m. <u>All</u> 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 rnee@utsi.edu; or Vicki Carr at 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, D-100, 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, 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 27. 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**	**scorda@utsi.edu**
Engineering Mgt.	**Dee Merriman**	**931-393-7293**	**dmerrima@utsi.edu**

TUITION AND/OR MAINTENANCE FEES*

Full Fees For In-State Students (per semester)

Maintenance Fee .... $3,131.00 *
Programs and Services Fee 75.00
Total $3,206.00

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

Maintenance Fee $3,131.00*
Programs and Services Fee 75.00
Tuition 6,329.00
Total $9,535.00

<u>*All fees are subject to changes approved by the Board of Trustees prior to the beginning of the term.</u>

TUITION FOR PART TIME STUDENTS

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

IN-STATE	**$348.00 per semester hour**
3 hrs.	**$1,044.00**
OUT-OF-STATE	**$1,052.00 per semester hour**
3 hrs.	**$3,156.00**

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 10, 2009) 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 VOL*Xpress* 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 VOL*Xpress* 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/FEES 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):

DROP DATE	CHARGE	REFUND
June 1 – June 5	**NO CHARGE**	**100%**
July 6 – June 11	**20% CHARGE**	**80%**
June 12 – June 16	**40% CHARGE**	**60%**
June 17 – June 21	**60% CHARGE**	**40%**
June 22 - End of Term	**100% CHARGE**	**NO REFUND**

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 F. The course will not be counted in the cumulative grade point average until a final grade is assigned. Students wishing to graduate Summer Semester 2009 must remove all INCOMPLETE GRADES by August 6, 2009.

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 <u>ALL</u> 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 2009 academic year is provided by UnitedHealthcare. The premium <u>must</u> be paid before registration. Contact the Human Resources Department (C-104, ext. 267) 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. 300 for information and times.

FINAL EXAM DATES FOR SUMMER SEMESTER 2009

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 OF TENNESSEE
SPACE INSTITUTE
SUMMER SEMESTER 2009 COURSE LISTINGS**

AEROSPACE ENGINEERING

*AE 422 AERODYNAMICS (3) **CANCELLED**
SEC. 001   (Video Recorded)
TEXT: John D. Anderson, Jr.; Fundamentals of Aerodynamics; 4th Edition, 2005;
        McGraw Hill
TIME: Tuesday & Thursday   1:00 – 3:30   E111
PROFESSOR: Dr. Peter Solies   (3)

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 Antar

*AE 513 EXPERIMENTAL METHODS IN FLUID MECHANICS (3) **CANCELLED**
SEC. 001
TEXT: J. R. Goldstein: Fluid Mechanics Measurements; 2nd Ed; Taylor and Francis;
        ISBN# 1-56032-306-X
TIME: Tuesday & Friday   10:00-12:00   E210
PROFESSOR: Dr. Ahmad Vakili   (3)

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   THEORY OF 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   (1)

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

AE   590   SELECTED ENGINEERING PROBLEMS (2-6)
SEC.   002   PROFESSOR: Dr. Milton Davis

AE   599   SPECIAL TOPICS IN AE: HYPERSONIC AIR BREATHING
           PROPULSION (3)
SEC. 001
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   (4)

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
        002   Collins
        003   Ranaudo
        004   Solies
        005   Muratore
        006   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   (Video Recorded)
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   (5)

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   (2)

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 – 2:30   E113
PROFESSOR: Dr. Basil Antar   (3)

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   517   SYSTEMS FLIGHT TESTING (3)
SEC. 002   (Interactive from UTK to UTSI)
TIME: Tuesday and Thursday   10:00 – 12:00 (CST)   E111
TEXT: TBD
PROFESSOR: Richard Ranaudo   (2)

Civil airworthiness requirements for development and certification of large fixed wing
transport category aircraft, FAA regulatory and advisory information is explained and
applications are made to systems flight test planning and execution. Flight test examples are
provided for all major aircraft systems to include hydraulic, propulsion, electrical, avionics,
autopilot, pneumatic and ice protection.

AS   550   PROJECT IN AVIATION SYSTEMS   (3)
SEC. 001   Corda
     002   Pujol
     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.

COMPUTER SCIENCE

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

CS   571   NUMERICAL MATHEMATICS I (3)
SEC.   001   (Same as Math 571)
TEXT: TBD
TIME: Monday & Wednesday   10:00 – 12:30   E111
PROFESSOR: Dr. Christian Parigger

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. *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.   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.   001   Schulz
        003   Flandro
        004   Majdalani
        005   Steinhoff
        006   Vakili
        011   Antar

ENGINEERING MANAGEMENT:

EM   501   CAPSTONE PROJECT IN ENGINEERING MANAGEMENT (3-6)
SEC. 001   UTSI on Campus Students Use This Number
SEC. 002   UTSI off Campus Students Use This Number
PROFESSOR: Drs. Gregory Sedrick and 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   UTSI Students Participating at Tullahoma or Oak Ridge
SEC. 002   UTSI Students Participating Elsewhere
PROFESSOR: Drs. Gregory Sedrick and 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   535   Management of Technology (3)
SEC. 001   UTSI Students Participating at Tullahoma and Oak Ridge
SEC. 002   UTSI Students Participating Elsewhere
TEXT: Go to http://www.utsi.edu/academics/iieandem/student_services.htm
TIME: Monday & Wednesday   4:00 – 6:35   E113
PROFESSOR: Dr. Gregory Sedrick   (6)

Factors other than mechanical or chemical which enter into successful establishment of
manufacturing or service enterprise. Organizational and financial planning and evaluation.
Cost and location studies and market analysis to determine commercial feasibility of new
ventures. *Prerequisite: EM 539 or approval from instructor.*

EM   536   PROJECT MANAGEMENT   (3)
SEC. 001   UTSI Students participating at Tullahoma or Oak Ridge
SEC. 002   UTSI Students participating elsewhere
TEXT: Go to http://www.utsi.edu/academics/iieandem/student_services.htm
TIME: Tuesday & Thursday   4:00 – 6:35   E113
PROFESSOR: Dr. Denise Jackson   (13)

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
TEXT: Go to http://www.utsi.edu/academics/iieandem/student_services.htm
TIME: Tuesday & Thursday   4:00 – 6:35   E111
PROFESSOR: Dr. Alberto Garcia   (2)

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
TEXT: Go to http://www.utsi.edu/academics/iieandem/student_services.htm
TIME: Monday & Wednesday   4:30 – 7:00   E111
PROFESSOR: Dr. Frank W. Steinle, Jr. (3)

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. 013   Sedrick
SEC. 016   Jackson

IE   691   ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)
SEC. 001   Sedrick

IE   693   ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)
SEC. 002   Sedrick
        003   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   Recorded from UTSI
TEXT: M. Spiegel: Complex Variables Schaum's Outline; Mc-Graw Hill; 29th Ed;
      ISBN# 07-060230-1
TIME: Monday & Thursday   1:00 – 3:00   E113
PROFESSOR: Dr. Horace Crater   (4)

Theory of functions of complex variable (arithmetic, algebra, and trigonometry); complex differentiation and analytic functions with applications to solutions of Laplaces 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 513   MATHEMATICAL PRINCIPLES OF FLUID MECHANICS I (3)
SEC.   001
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. Gary Flandro

Equations of motion, incompressible and compressible potential flow, shock waves, viscous flows. Navier-Stokes equations. *Recommended Background: Advanced courses in ordinary and partial differential equations and advanced calculus.*

MATH 571   NUMERICAL MATHEMATICS (3)
SEC.   001   (Same as CS 571)
TEXT: TBD
TIME: Monday & Wednesday   10:00 – 12:30   E111
PROFESSOR: Dr. Christian Parigger

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. *Prereqs: 445, 446, 453, 471 and 472.*

Comment: Same as CS 571. Students wishing to count this course toward IGMCS should enroll under Math 571, since IGMCS will it as a Math course only.

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   (Interactive Video)
TEXT: TBD
TIME: Wednesday   1:00 – 3:00   E113
              Friday   1:00 – 3:00   E111
PROFESSOR: Dr. Kenneth Kimble   (5)

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   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   (1)

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. 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 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 601   ATOMIC PHYSICS (3)
SEC.   001
TEXT: Classic books, on-line references, lecture and lab notes: (1) several textbooks will be
      used to review classical laser spectroscopy: "<u>Laser Spectroscopy</u>," Demtröder;
      "<u>Atomic and Laser Spectroscopy</u>," Corney; "<u>Introduction to Nonlinear Laser</u>
      <u>Spectroscopy</u>," Levenson; "<u>Aux Frontieres de la Spectroscopie Laser</u>," Les Houches,
      Vol. 1, 2 ed. Balian, Haroche, Liberman; "<u>Laser Spectroscopy</u>," ed. Brewer,
      Mooradian, "<u>Physics Reports: High resolution spectroscopy with lasers</u>," 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 ; (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.*

Summer 2009
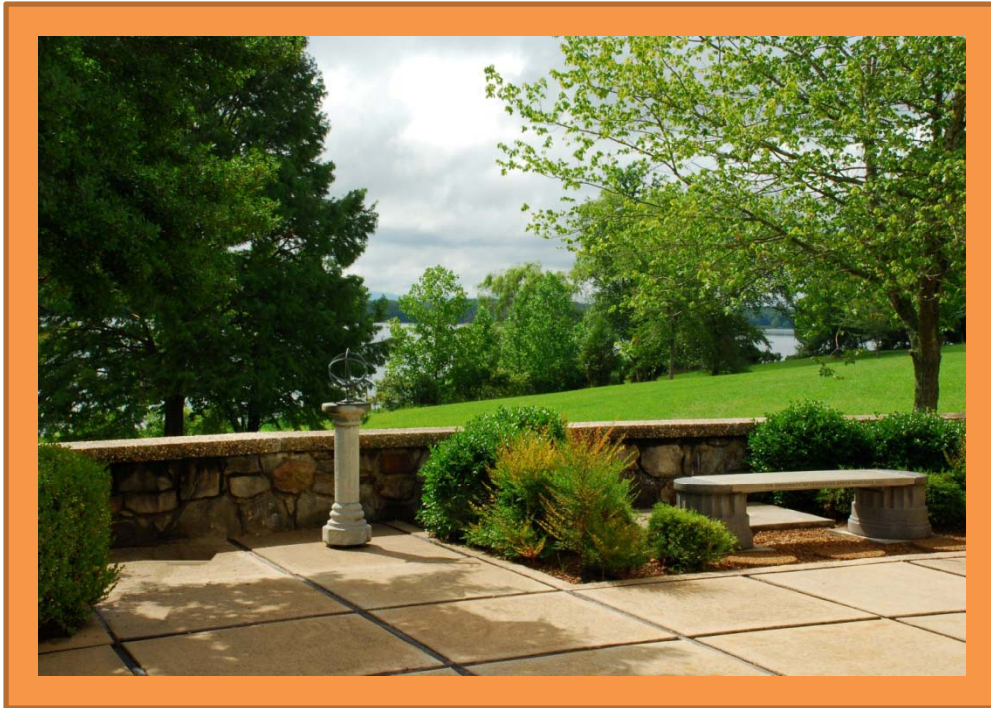
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See Inside for Online Registration Instructions
https://cpo.utk.edu/CPOWeb