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CALENDAR --- FALL SEMESTER 2007

Priority Registration	March 19-August 14, 2007 until 12 midnight
Fall 2007 Graduation Application Deadline.....	August 10, 2007
Admission to Candidacy Forms due for Fall 2007 Commencement	August 10, 2007
Late Registration and late fees begin	August 15-August 31, 2007 until 4:00 PM
Classes begin	August 22, 2007
Last Day to drop without "W" on the transcript, change to/from audit, add a course without the instructor's signature	August 31, 2007
Labor Day Holiday	September 3, 2007
Graduation Fee Payment Deadline.....	September 24, 2007
Last day to add/change credit or grading options with signatures.....	October 2, 2007
Fall Break (No Classes).....	October 11 & 12, 2007
Last day to meet with consultant for Thesis/Dissertation Preliminary Review	October 24, 2007
Tentative deadline to purchase cap/gown and order hood.....	October 25, 2007
Last day to register to attend graduate hooding.....	October 26, 2007
Last day to schedule final exam (thesis).....	October 26, 2007
Last day to schedule final exam (non-thesis/capstone students)	October 26, 2007
Last day to schedule final exam (dissertation)	November 2, 2007
Last day to take final exam (thesis/dissertation students).....	November 9, 2007
Last day to take final comprehensive exam (non-thesis/capstone students).....	November 9, 2007
Last day to drop with a "W" full session courses	November 13, 2007
Thesis/Dissertation Deadline (Electronic)	November 21, 2007
Report of thesis/dissertation defense or final examination (Pass/Fail Form)	November 21, 2007
Thanksgiving Holiday	November 22 & 23, 2007
Deadline for submission of Admission to Candidacy for students graduating Spring 2008	December 4, 2007
All " INCOMPLETES " must be removed for Graduation	December 4, 2007
Classes End	December 4, 2007
Total withdrawal from the University Deadline.....	December 4, 2007
Study Period	December 5, 2007
Exam Period	December 6, 7, and 10, 2007
Doctoral Hooding (UTK)	December 14, 2007 (Friday)
COMMENCEMENT (UTK).....	December 15, 2007 (Saturday)
Second thesis/dissertation deadline (Student will receive diploma May 2007 but do not have to register for Spring 2008) (Defense Completed by December 5)	January 4, 2008

SPRING SEMESTER 2008

Priority Registration for Spring Semester 2008 begins at UTK	TBD
Final Registration for UTSI students	TBD
Classes begin	January 9, 2008
Martin Luther King Day (Holiday)	January 21, 2008
Spring Break.....	March 14 & 17-20, 2008
Spring Recess - Good Friday Holiday	March 21, 2008
Classes End	April 25, 2008
Study Period	April 28, 2008
Exam Period	April 29 & 30, May 1, 2008
Graduate Hooding Ceremony (UTK).....	May 8, 2008
Commencement (UTK).....	May 9, 2008

**FALL SEMESTER 2007
FINAL STUDY DAY AND EXAM SCHEDULE**

LAST DAY OF CLASSES.....December 4, 2007

STUDY PERIODDecember 5, 2007

FINAL EXAMS - - - December 6, 7 and 10, 2007

REGULAR CLASS TIME (Same Classroom) EXAM TIME

1ST Day - Thursday, December 6, 2007

7:45 - 9:00	M/Th	7:45 - 9:45
10:45 - 12:00	M/Th	10:15 - 12:15
9:15 - 10:30	M/Th	1:00 - 3:00
2:30 - 3:45	M/Th	3:30 - 5:30

2nd Day - Friday, December 7, 2007

9:15 - 10:30	Tu/Fri	7:45 - 9:45
10:45 - 12:00	Tu/Fri	10:15 - 12:15
1:00 - 2:15	Tu/Fri	1:00 - 3:00
2:30 - 3:45	Tu/Fri	3:30 - 5:30

3rd Day - Monday, December 10, 2007

7:45 - 9:00	Tu/Fri	7:45 - 9:45
1:00 - 2:15	M/Th	10:15 - 12:15

****** ATTENTION ******

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

**NO CLASSES WILL BE IN SESSION
AT THIS TIME**

**REGISTRATION ANNOUNCEMENT
FALL SEMESTER 2007**

REGISTRATION PROCEDURE

ADVISING

Graduate students should contact their departmental faculty to arrange an advising appointment. The web registration system will ask if you have discussed your program with your advisor. Answer "yes" if you have. Graduate Studies Web Page <http://web.utk.edu/~gsinfo>

REGISTRATION

UTSI students **MUST** register for the Fall semester 2007 on the web at Circle Park Online <https://cpo.utk.edu/CPOWeb/> . 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 19, - August 14, 2007. Late registration will be August 15 – August 31, 2007. Classes begin August 22, 2007.

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	August 4, 2007
Statement information available on CPO.utk.edu	August 6, 2007
Priority registration, payment/confirmation deadline	August 14, 2007 (4:30 p.m. CST)
Late registration/late fees begin	August 15, 2007
Late registration payment/confirmation deadline	August 31, 2007 (4:30 pm CST)

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. 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

TOLL-FREE NUMBERS

For a specific office: 1-888-822-UTSI(8874) and the extension number.
For general information: 1-888-822-UTSI (8874)
Admissions Office: 1-888-822-UTSI (8874)-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. 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 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 using the URL <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 Admission 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 August 15, 2007. The only credit/debit cards The University of Tennessee Space Institute accepts are 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.	Penny Morris	931-393-7293	pmorris@utsi.edu

TUITION AND/OR MAINTENANCE FEES 

PROGRAMS AND SERVICES FEE

All students enrolled in nine semester hours or more for Fall or Spring Semester are assessed an activity fee of \$90.00 per semester. Part-time students taking fewer than nine 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 videotape 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 re-deposited. 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 payable on the 45th (Oct. 6, 2007) 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/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
August 23 - August 27	NO CHARGE	100%
August 28 – September 2	20% CHARGE	80%
September 3 – September 7	40% CHARGE	60%
September 8 - 12	60% CHARGE	40%
September 13 - 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 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 this 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, 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 <http://registrar.tennessee.edu/records/grades.shtml> 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 DEADLINE FOR FEE REFUNDS ARE NOT THE SAME.**

FULL-TIME STUDENTS

Students enrolled in at least 9 semester hours during the Fall/Spring semesters or 6 hours in the Summer Term are considered full-time students. Research Assistants must be full-time students and also enroll in one of the MABE 595 seminars or a PHYS 599 seminar each term, unless a waiver is granted by the Dean for Academic Affairs.

REMOVAL OF INCOMPLETE GRADES

All Incomplete Grades (I) should be removed within one semester, excluding the Summer Term unless other arrangements have been made with the instructor. If the I is not removed within one calendar year, 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 Fall Semester 2007 must remove all **INCOMPLETE GRADES** by **December 4, 2007**.

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 UTSI, are required to have comprehensive medical insurance. The policy for the 2007 - 2008 academic year will be announced in August 2007. 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 FALL SEMESTER 2007

STUDY PERIOD...December 5

FINAL EXAMS.....December 6, 7 and 10, 2007

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.

TO BE DETERMINED

TECHNICAL WRITING COURSE

**THIS IS A NON-CREDIT COURSE REQUIRED FOR ALL GRA's AT UTSI
AND OPTIONAL FOR ALL OTHER STUDENTS.**

ENHANCE YOUR CAREER: Learn to efficiently tackle writing chores and to effectively communicate in writing. This course, designed for scientists and engineers, reviews the most important aspects of clear communication, with an emphasis on organization and coherence. The principles of logic, grammar, and style are considered as they apply to technical documents -- especially proposals, theses, and dissertations. Oral presentations and resumes will also be covered.

INSTRUCTOR: Dr. Mary McLemore

TEXT: John M. Lannon: *Technical Communication*; 10th ed., Longman, ISBN# 0321270762

TIME: Tuesday

ROOM: TBD

FEE: \$165.00 for non-GRA students

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

**THE UNIVERSITY OF TENNESSEE
SPACE INSTITUTE
FALL SEMESTER 2007 COURSE LISTINGS**

AEROSPACE ENGINEERING

AE 500 Master's Thesis (3, 6, 9)
SEC. 001 Moeller
006 Schulz
007 Vakili
008 Majdalani
009 Steinhoff
010 Flandro
011 Antar
012 Moulden
014 Corda

AE 511 INVISCID FLOW (3)
SEC. 001 Videotaped at UTSI

TEXT: Karamcheti: Principles of Ideal Fluids Aerodynamics; R. E. Krieger Publ. Co.;
ISBN# 0898741130

TIME: Monday & Thursday 1:00 - 2:15 E112

PROFESSOR: Dr. Ahmad Vakili

Brief review of vector algebra, kinematics and dynamics of inviscid fluids; potential flow about body, conformal mapping review and application. Prereq: AE 422 or ME 531, MATH 425 or equivalent.

AE 521 AERODYNAMICS OF COMPRESSIBLE FLUIDS (3)
SEC. 001

TEXT: TBD

TIME: Monday & Thursday 10:45 – 12:00 E210

PROFESSOR: Dr. Gary Flandro

One-dimensional internal and external flow; waves; small perturbation theory; slender body theory; similarity rules; method of characteristics. Prereq: 422.

AE 527 AEROSPACE GROUND TEST FACILITIES (3)
SEC. 001

TEXT: Instructor Lecture Notes and Short Course Notes

TIME: Tuesday & Friday 9:15 – 10:30 E210

PROFESSOR: Dr. Roy Schulz

Atmospheric models and similarity considerations; aerodynamic test facilities; continuous and intermittent wind tunnels and ballistic ranges; propulsion test facilities or air breathing and rocket engines; space environment and space vehicle test facilities. Prereq: 521, 541 and Mechanical Engineering 522.

AE 532 INTRODUCTION TO TURBULENCE (3)
SEC. 001
TEXT: Lecture Notes on “Blackboard”
TIME: Tuesday & Friday 1:00 - 2:15 B112
PROFESSOR: Dr. Trevor Moulden

Equations of motion and basic kinematics. Types of flow structure in turbulent motion. The Reynolds decomposition and an introduction to turbulence models. Introduction to statistical concepts and equations in the spectral space.

AE 541 FLUID MECHANICS I (3)
SEC. 001 (Cross Listed ES 541 & ME 541)
TEXT: R.L. Panton: Incompressible Flow; Wiley Interscience; 3rd: ISBN# 047126122X
TIME: Tuesday & Friday 1:00 - 2:15 E211
PROFESSOR: Dr. Basil Antar

Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newtons second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows. Prereq: AE511 or equivalent, or consent of instructor.

*AE 557 AEROSPACE VEHICLE FLUTTER & VIBRATION (3) **CANCELLED**
SEC. 003
TEXT: TBD
TIME: Monday & Thursday 1:15 – 2:30 E210
PROFESSOR: Dr. Roy Schulz

Aeroelastic phenomena. Structural and aerodynamic operators. Stability criteria for airfoils operating in oscillating stream. Two-and-three-dimensional flutter of wings, control surfaces and empennages. Prereq: 423, 551.

AE 572 COMPUTATIONAL FLUID DYNAMICS (3)
SEC. 001 (Same as ES 552 & ME 562)
TEXT: TBD
TIME: Monday & Thursday 4:00 – 5:15 B210
PROFESSOR: Dr. John Steinhoff

Modern techniques in computing fluid dynamic flows will be covered. First, different classes of flows will be reviewed, and the most appropriate methods that satisfy both the physics requirements (capture the essential physics), and the engineering requirements (time required to set up and compute solutions) will be discussed. Methods suited for general configurations (blunt bodies) and methods suited for streamlined bodies, such as aircraft will be contrasted. The types of problems for which incompressible methods or compressible methods are best used, as well as those for which turbulence modeling is required will be covered. Accuracy issues and requirements will be covered, both for fully resolved flows and flows where turbulence modeling is needed. Particular equations to be covered include Potential, Euler, and (for laminar flow) Navier Stokes, as well as “Large Eddy Simulation” and “Reynolds Averaged Navier Stokes” for modeling turbulent flows. For compressible flows, methods involving shock capturing, with higher order schemes and limiters will be covered. For general flows, methods involving efficient treatment of concentrated vortices, passive scalar transport, as well as free surfaces will also be covered.

AE 599 SPECIAL TOPICS IN AEROSPACE ENGINEERING: INDUSTRIAL
 PLASMA ENGINEERING I (3)
 SEC. 001 (Crosslisted ECE565 Continuation to ECE566)
 TEXT: Foundations of Plasma Dynamics. This book is no longer in print, but copies of pertinent
 sections will be provided. E.H. Holt and R.E. Haskell, The Macmillan Co., 1965, 1st Ed.,
 ISBN#: Library of Congress catalog card number: 65-14072
 TIME: Tuesday & Friday 10:45 – 12:00 F252
 PROFESSOR: Dr. Trevor Moeller

This course will focus on the fundamentals of plasmas, where they are found, and their characteristics. Topics will include an introduction to electromagnetics, charged particle motion in static and uniform electric and magnetic fields, elastic collision processes, plasma kinetic theory, and charged particle interactions. The magnetohydrodynamic (MHD) approximation will also be introduced.

AE 595 SEMINAR: AEROSPACE AND MECHANICAL SYSTEMS (1)
 SEC. 001 (Same as ME 595 and ES 595)
 PROFESSOR: Dr. Ahmad Vakili

AE 600 DOCTORAL RESEARCH AND DISSERTATION (3, 6, 9)
 SEC. 005 Schulz
 006 Vakili
 007 Majdalani
 008 Steinhoff
 009 Flandro
 010 Antar
 011 Corda

AVIATION SYSTEMS

AS 500 MASTER'S THESIS (3, 6, or 9)
 SEC. 001 Corda
 002 Solies
 003 Collins
 004 Ranaudo

AS 501 AVIATION SYSTEMS: AN OVERVIEW (3)
 SEC. 001
 TEXT: TBD
 TIME: Wednesday 9:00-11:30am Airport Classroom
 PROFESSOR: Dr. Stephen Corda

Aviation systems, present and future. Socioeconomic base, aerospace and propulsion technology, meteorology, air traffic control, airport community interface, and technological trends and developments pertinent to present status, and future development of air transportation.

Comments: The course will provide an introduction to Aviation Systems and the discipline of Flight Test Engineering. Topics will include aviation fundamentals, basic airmanship, aerospace mathematics and physics, basic aerodynamics, performance, and stability & control, flight test instrumentation and data acquisition, flight test fundamentals, and flight test data analysis and reporting. Course structure will be weekly classroom academics with 3 flight labs during the semester. **This course is designed for full time attendance during the semester and will not be offered as a Distance Learning course.**

AS 502 REGISTRATION USE OF FACILITIES (1 –15)
SEC. 001 PROFESSOR: Dr. Stephen Corda

AS 509 INTRODUCTION TO AIRCRAFT STRUCTURES (3)
SEC: 002

TEXT: T.H.G. Megson; Aircraft Structures for Engineering Students; Halsted Press of Wiley & Sons; 3rd Edition; ISBN 0-340-70588-4

REFERENCE BOOK: D.J. Peery & J.J. Azar; Aircraft Structures; McGraw-Hill, Inc.; 2nd Printing, 1982; ISBN 0-07-049196-8

TIME: Tuesday & Friday 1:00 – 2:15 E113
PROFESSOR: Dr. U. Peter Solies

Introduction to design and analysis of structures, with emphasis on light weight and modern materials used for aircraft structures. Topics include: Load Determination and Aviation Regulations, Airworthiness, Ultimate Loads, Limit Loads, Load Factors; Simplifying Assumptions to the Safe Side; Basics of Stress and Strain; Elasticity, Shear, Bending, Torsion; Statically Indeterminate Systems, Frames; Structural Instabilities, Buckling of Columns, Thin Plates; Tension Field Beams; Principles of Stressed Skin Construction; Open, Closed, Thin-walled Beams; tapered Beams, Fuselages and Frames, Wing and Ribs; Laminated Composite Structures; Elementary Aeroelasticity.

AS 510 INTRODUCTION TO AVIONICS I (3)
SEC 001 (Recorded at UTSI)

TEXT: Len Buckwalter: Avionics Training for Systems, Installation and Troubleshooting; Avionics Communications Inc, latest edition; ISBN 1-88-5544-21-9

TIME: Tuesday & Friday 10:30 – 11:45 E112
PROFESSOR: Dr. Alfonso Pujol, Jr.

Avionic systems and communications, including frequency, satellite and aircraft communications, selective calling, emergency locator transmitter, omni-directional range, instrument and microwave landing systems, automatic direction finder, and other topics are also discussed. This course provides the foundation for second semester “Introduction to Avionics II.”

AS 510 HUMAN FACTORS IN CREW STATION DESIGN (SPECIAL TOPICS) (3)
SEC 002

TEXT: Cockpit Engineering; Jarrett, D.N.; First edition; Ashgate Publishing; ISBN# 0-7546-1751-3;

Human Factors in Civil Flight Deck Design; Harris, D.I.; First edition; Ashgate Publishing; ISBN# 0-7546-1380-1

TIME: Tuesday & Thursday 10:00 – 11:15 E113
PROFESSOR: Professor Richard Ranaudo

Cockpit design criteria are presented for various fighter and transport aircraft. Topics such as human physiology, cognitive functional analysis, anthropometric accommodation, crew protection, cockpit displays and controls, emergency escape and egress systems are discussed. Criteria for crew station design for fighter, transport and rotary wing aircraft are discussed in terms of visual and audio displays, head-up guidance and helmet mounted systems, and flight deck evaluation. Textbooks are further supplemented by materials from selected publications, Department of Defense and FAA documents.

AS 522 EXPERIMENTAL FLIGHT MECHANICS: FIXED WING STABILITY AND CONTROL (3)

SEC. 001

TEXT: Ralph D. Kimberlin: Flight Testing of Fixed Wing Aircraft; AIAA Education Series; ISBN# 1 56347 564 2

TIME: Tuesday & Friday 8:00 – 9:15 Airport Classroom

PROFESSOR: Dr. Stephen Corda and Dr. Peter Solies

This course will cover fundamental theories, flight test techniques, and data collection and analyses for fixed wing aircraft stability and control. Topics will include static and dynamic longitudinal stability, longitudinal maneuvering stability and control, static and dynamic lateral-directional stability, lateral control power, and departure testing. Course structure will be weekly classroom academics with approximately 4-6 flight labs evenly distributed during the semester. This course is designed for full time attendance during the semester and will not be offered as a Distance Learning course. Prereq: AS521- Fixed Wing Performance or consent of instructor.

AS 550 PROJECT AVIATION SYSTEMS (3)
SEC. 001 Corda
002 Solies
003 Collins
004 Ranaudo

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

CHEMICAL ENGINEERING

CHEM E 500 MASTER'S THESIS (3, 6, or 9)
SEC. 002 PROFESSOR: Dr. Atul Sheth

COMPUTER SCIENCE

CS 500 MASTER'S THESIS (1 - 15)
SEC. 017 PROFESSOR: Dr. Bruce Whitehead

Prereq: Admission into the M.S. program in Computer Science, and prior completion of at least 9 graduate credits of CS courses.

CS 502 REGISTRATION FOR USE OF FACILITIES (3)
SEC. 002 PROFESSOR: Dr. Bruce Whitehead

Required for a student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed. May not be used towards degree requirements. May be repeated. S/NC only.

CS 541 DATABASE MANAGEMENT SYSTEMS (3)
SEC. 001 (Interactive from UTSI)
TEXT: Jan L. Harrington: Relational Database Design Clearly Explained; 2nd ed., Morgan Kaufmann Publishers; ISBN# 1-55860-820-6
Chris Fehily: SQL: Visual QuickStart Guide; Peachpit Press; 2nd ed. ISBN# 0321334175
TIME: Tuesday & Thursday 1:10 – 3:00 E113
PROFESSOR: Dr. Bruce Whitehead

Students in fields other than Computer Science with background equivalent to CS 311 Discrete Structures are welcome in this course. Detailed course description and syllabus at <http://www.utsi.edu/cs/541/>. An open-source PostgreSQL relational database management system (DBMS) running on a Linux server will be available for hands-on course work. Students

will be able to access this DBMS from any web browser. Prerequisite: CS 311 Discrete Structures or equivalent.

ELECTRICAL and COMPUTER ENGINEERING

ECE 500 MASTER'S THESIS (3, 6, or 9)
SEC. 001 Bomar
025 Smith
026 Whitehead
027 Pujol

ECE 501 PROJECT IN LIEU OF THESIS (3)
SEC. 001 Bomar
006 Smith
007 Whitehead
008 Pujol

ECE 505 DIGITAL SIGNAL PROCESSING I (3)
SEC. 002

TEXT: Proakis, John G. and Manolakis, Dimitris G., Digital Signal Processing: Principles, Algorithms, and Applications; Prentice-Hall, 4th Ed.; ISBN# 0131873741

TIME: Tuesday & Friday 9:15 - 10:30 F252

PROFESSOR: Dr. Bruce Bomar

Discrete-time signals and systems, sampling, fast Fourier transform (FFT) and fast convolution, design of FIR and IIR digital filters.

ECE 565 INDUSTRIAL PLASMA ENGINEERING I (3)
SEC. 002 (Same as AE599 Special Topics in Aerospace Engineering)

TEXT: Foundations of Plasma Dynamics. This book is no longer in print, but copies of pertinent sections will be provided. E.H. Holt and R.E. Haskell, The Macmillan Co., 1965, 1st Ed., ISBN#: Library of Congress catalog card number: 65-14072

TIME: Tuesday & Friday 10:45-12:00 F252

PROFESSOR: Dr. Trevor Moeller

This course will focus on the fundamentals of plasmas, where they are found, and their characteristics. Topics will include an introduction to electromagnetics, charged particle motion in static and uniform electric and magnetic fields, elastic collision processes, plasma kinetic theory, and charged particle interactions. The magnetohydrodynamic (MHD) approximation will also be introduced.

ENGINEERING SCIENCE

ES 500 MASTER'S THESIS (1 - 15)
SEC. 001 Moeller
009 Schulz
010 Vakili
011 Majdalani
012 Steinhoff
013 Flandro
014 Antar

ES 541 FLUID DYNAMICS I (3)

SEC. 001 (Cross Listed AE 541 & ME 541)
 TEXT: R.L. Panton: Incompressible Flow; Wiley Interscience; 3rd: ISBN# 047126122X
 TIME: Monday & Thursday 1:00 – 2:15 E211
 PROFESSOR: Dr. Basil Antar

Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newton's second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows. Prereq: AE511 or equivalent, or consent of instructor.

ES 552 COMPUTATIONAL FLUID DYNAMICS (3)
 SEC. 001 (Same as AE 572 & ME 562)
 TEXT: TBD
 TIME: Tuesday & Friday 4:00 – 5:15 B210
 PROFESSOR: Dr. John Steinhoff

Modern techniques in computing fluid dynamic flows will be covered. First, different classes of flows will be reviewed, and the most appropriate methods that satisfy both the physics requirements (capture the essential physics), and the engineering requirements (time required to set up and compute solutions) will be discussed. Methods suited for general configurations (blunt bodies) and methods suited for streamlined bodies, such as aircraft will be contrasted. The types of problems for which incompressible methods or compressible methods are best used, as well as those for which turbulence modeling is required will be covered. Accuracy issues and requirements will be covered, both for fully resolved flows and flows where turbulence modeling is needed. Particular equations to be covered include Potential, Euler, and (for laminar flow) Navier Stokes, as well as "Large Eddy Simulation" and "Reynolds Averaged Navier Stokes" for modeling turbulent flows. For compressible flows, methods involving shock capturing, with higher order schemes and limiters will be covered. For general flows, methods involving efficient treatment of concentrated vortices, passive scalar transport, as well as free surfaces will also be covered.

ES 566 OPTICAL ENGINEERING I
 SEC. 002
 TIME: Tuesday & Friday 10:45 – 12:00 F253
 TEXT: Fundamental Principles of Optical Engineering;
 (Lecture Notes to Printed & Sold in the UTSI Bookstore)
 PROFESSOR: Dr. L. Montgomery Smith

Geometrical Optics: Laws of reflection and refraction, paraxial optics ray-transfer matrices, imaging and focusing systems, optical resonators. Aberrations: exact ray-transfer matrices for skew rays, computational methods, program development, specifications for spherical aberration, coma, astigmatism, field curvature and distortion. Physical Optics: Maxwell's equations, plane wave propagation, Fresnel's equations, interferometry. Scalar diffraction Theory: solutions of the governing equations, Fresnel diffraction, propagation of Gaussian beams.

ES 595 SEMINAR: COMPUTATIONAL MECHANICS (1)
 SEC. 001 PROFESSOR: Dr. John Steinhoff

ES 600 DOCTORAL AND RESEARCH DISSERTATION (3, 6, 9)
 SEC. 006 Schulz
 007 Vakili
 008 Majdalani
 009 Steinhoff
 010 Flandro
 011 Antar

INDUSTRIAL ENGINEERING: 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 Receiving Tapes/CD/Interactive Use this Number
PROFESSOR: Dr. Gregory Sedrick

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 Receiving Tapes/CD/Interactive Use this Number
PROFESSOR: Dr. Gregory Sedrick

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 533 THEORY AND PRACTICE OF ENGINEERING MANAGEMENT (3)
SEC. 001 (Interactive Video from UTSI)
SEC. 002 UTSI OFF CAMPUS Students Receiving Tapes/CD/Interactive Use this Number
TEXT: 1. Babcock: Managing Engineering & Technology; Prentice Hall; Latest Edition; ISBN# 0131413029
2. Senge: Fifth Discipline; Bantam; Latest Edition; ISBN# 0385260954
TIME: Monday 4:00 - 6:35 pm E113
PROFESSOR: Dr. Joe Costa

Manager's perspective; business definition; strategic planning and management; marketing and competition in global economy; finance; organization; systems thinking; team building; corporate culture and leadership in new organization; and quality, empowerment, and learning organizations. Principle application to work settings and case studies.

EM 537 ANALYTICAL METHODS FOR ENGINEERING MANAGERS (3)
SEC. 001 (Interactive Video from UTSI)
SEC. 002 UTSI OFF CAMPUS Students Receiving Tapes/CD/Interactive Use this Number
TEXT: Gaither: Production & Operations Management; Southwestern, 9th Latest Ed; ISBN# 0538891084
TIME: Wednesday 1:00 - 3:30 pm E113
PROFESSOR: Dr. Gregory Sedrick

Survey of management analysis and control systems through IE techniques. Qualitative and quantitative systems: methods analysis, work measurement, incentive systems, wage and salary development, production and inventory control, facility layout, linear programming, and applied operations research techniques. Not for credit for students with undergraduate degrees in industrial engineering.

INDUSTRIAL ENGINEERING

IE 500 MASTER'S THESIS
SEC. 011 Sedrick
004 Jackson

IE 515 ADVANCED PRODUCTION AND INVENTORY SYSTEMS (3)
SEC. 006 UTSI ON Campus Students CENTRA (Web-based Course from UTK)
SEC. 007
TIME: TBD
TEXT: TBD
PROFESSOR: Dr. Alberto Garcia

Advanced topics in production planning and inventory systems. Material requirements planning; production planning and master scheduling; just-in-time concepts; distribution requirements planning; and other selected topics. Prereq: 402 or consent of instructor.

IE 516 STATISTICAL METHODS IN INDUSTRIAL ENGINEERING (3)
SEC. 003 UTSI ON Campus Students CENTRA (Web-based Course from UTK)
SEC. 004 UTSI OFF CAMPUS Students Receiving Tapes/CD/Interactive Use this Number
TEXT: Montgomery: Engineering Statistics; Wiley; ©98;
Sall and Lehman; JMP Software; Dusbury Press; ISBN# 0-534-26565-0
TIME: Thursday 5:05 - 6:20 (EST) at UTK
PROFESSOR: Dr. Gregory Sedrick

Application of classical statistical techniques to industrial engineering problems. Statistics and statistical thinking in managerial context of organizational improvement; descriptive statistics and distribution theory; relationship between statistical process control techniques and classical statistical tools; parameter estimation and hypothesis testing; goodness-of-fit testing; linear regression and correlation; analysis of variance; single and multiple factor experimental design. Prereq: Probability and Statistics for Scientists and Engineers, or equivalent.

IE 519 HUMAN FACTORS ENGINEERING AND ERGONOMICS (3)
SEC. 006 UTSI ON Campus Students CENTRA (Web-based Course from UTK)
SEC. 007 UTSI OFF Campus Students Receiving Tapes/CD/Interactive Use this Number
TEXT: TBD
TIME: Thursday 11:10 – 12:25 (EST) at UTK
PROFESSOR: Dr. Alberto Garcia

Application of human factor and ergonomic concepts and principles to design and analysis of manned systems and products. Human as biomechanical system; human information processing; minimization of human error; anthropometry; anatomy and physiology; physical and mental workload; effects of environmental factors: temperature, lighting, weightlessness, and vibration on humans; manual materials handling and back injuries; design of workstations and office ergonomics; design of displays and controls; hand tool design; and cumulative trauma injuries. Prereq: Probability and Statistics for Scientists and Engineers I or consent of instructor.

IE 526 ADVANCED APPLICATIONS OF SYSTEMS MODELING AND
SIMULATION (3)
SEC. 003 UTSI ON Campus Students CENTRA (Web-based Course from UTK)
SEC. 004
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. X. Li

Modeling of discrete, continuous, and combined systems using current simulation software. Development of flexible simulation models to enhance accessibility of simulation models for experimentation. Development of distributed simulation models to represent and test production and supply chain systems. (Same as Management Science 526.) Prereq: 306 or 525.

IE 591 SPECIAL TOPICS IN INDUSTRIAL ENGINEERING (1-3)
SEC: 005 Sedrick
001 Jackson

Individual or group research projects.

IE 600 DOCTORIAL RESEARCH AND DISSERTATION (3-15)
SEC. 013 Sedrick
004 Jackson

MATERIAL SCIENCE & ENGINEERING

MSE 500 MASTER'S THESIS (3, 6, 9)
SEC. 002
PROFESSOR: Dr. William Hofmeister

MSE 512 FUNDAMENTALS OF MATERIALS SCIENCE AND ENGINEERING II (3)
SEC. 003
TEXT: TBD
TIME: Monday & Thursday 9:15 – 10:30 F252
PROFESSOR: Dr. William Hofmeister

Physical properties: electrical and thermal conduction, elementary quantum physics, band theory, dielectric materials, magnetic and optical properties. Mechanical behavior: stress and strain at a point, elastic constitutive equations, phenomenological bulk behavior, and deformation mechanisms.

*MSE 540 BASIC POLYMER CHEMISTRY (3) **CANCELLED**
SEC. 003
TEXT: TBD and Class Notes
TIME: TBD
PROFESSOR: Dr. Zhongren Yue

Synthesis, reactions and degradation of polymers. Molecular characterization: solution methods and spectroscopy.

Comments: Polymer solution properties, conformation and molecular weight characterization. Rheological and viscoelastic behavior: relaxations and transitions, rubber elasticity. Crystallinity, morphology and deformation of crystalline polymers. Synthesis and structure of high strength/modulus polymer materials. Structure and properties of advanced composites and blends.

MSE 552 FIBER SCIENCE (3)
SEC. 003
TEXT: TBD and Class Notes
TIME: TBD
PROFESSOR: Dr. Zhongren Yue

Physical properties, mechanical properties and microstructure of polymeric fibers; relation to end-use properties.

Comments: Introduction of high performance fibers and fiber-reinforced composite materials; synthesis, structure, and properties of fibers – carbon, organic and inorganic fibers, etc; fabrication of fiber reinforced composite materials; composite characterization.

MSE 600 DOCTORAL RESEARCH AND DISSERTATION (3, 6, 9)
SEC. 002 PROFESSOR: Dr. William Hofmeister

MATHEMATICS

MATH 404 APPLIED VECTOR CALCULUS (3)
SEC. 001
TEXT: Wilfred Kaplan: Advanced Calculus; 5th ed.; Addison Wesley; ISBN# 0-201-79937-5
TIME: Monday & Thursday 9:15 - 10:30 B210
PROFESSOR: Dr. Boris Kupershmidt

Refresher of one-variable calculus; function of several variables; partial derivatives; Vectors and vector fields; curves and surfaces; multiple, line, and surface integrals. Green and Stokes' theorems.

MATH 453 MATRIX ALGEBRA II (3)
SEC. 001
TEXT: G. Strang: Linear Algebra and It's Applications; 3rd Ed., Harcourt Brace Jovanovich; ISBN# 0155510053
TIME: Monday & Thursday 1:00 - 2:15 B112
PROFESSOR: Dr. Trevor Moulden

Matrix Operations, Linear spaces and subspaces. Solution of linear equations. Orthogonality. The matrix eigenvalue problem and eigenspaces. The Jordan normal form. (this course is a prerequisite for MATH 431 in Spring 2008).

MATH 471 NUMERICAL ANALYSIS (3)
SEC. 001 (Recorded at UTSI)
TEXT: Cleve B. Moler: Numerical Computing with MATLAB; SIAM; ISBN#0898715601
TIME: Monday & Wednesday 1:00 - 2:15 E113

PROFESSOR: Dr. Kenneth Kimble

Numerical computation, instabilities, and rounding. Interpolation and approximation by polynomials and piecewise polynomials. Quadrature and numerical solution of initial and boundary value problems of ordinary differential equations, stiff systems. Prereq: Numerical Algorithms I or consent of instructor.

MATH 499 SEMINAR IN MATHEMATICS: INTRODUCTION TO TENSORS (3)
SEC. 002
TEXT: J. G. Simmonds: A Brief on Tensor Analysis, 2nd Ed, ISBN#354094088X
TIME: Monday & Thursday 9:15 - 10:30 E210
PROFESSOR: Dr. Trevor Moulden

Vectors in covariant and contravariant bases. Change of Basis. Second order tensors. Tensor calculus and Christoffel symbols. Surfaces and surface curvature. Prereq: MATH 432. this course is a prereq. For ES 539.

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

SEC. 001
PROFESSOR: Dr. Boris Kupershmidt

MATH 517 MATHEMATICAL METHODS IN PHYSICS (3)

SEC. 004

TEXT: G. Arfken: Mathematical Methods for Physicists; Academic Press,
ISBN #0-12-059825-6

TIME: Monday & Thursday 1:00 – 2:15 B210

PROFESSOR: Dr. Boris Kupershmidt

Vectors and Matrices; Infinite series; complex variables; integral equations; Calculus of Variations. Prereq: Advanced calculus and differential equations. Must be taken in sequence.

MECHANICAL ENGINEERING

ME 500 MASTER THESIS (3)

SEC. 001 Moeller

021 Schulz

022 Vakili

023 Majdalani

024 Steinhoff

025 Flandro

026 Antar

ME 511 HEAT TRANSFER I (3)

SEC. 001

TEXT: G. E. Meyers: Analytical Methods in Conduction Heat Transfer; Amcht Publishing;
ISBN# 0966606507

TIME: Tuesday & Friday 9:15 – 10:30 E112

PROFESSOR: Dr. Basil Antar

Thermal physical properties of material. Analysis of steady-state and time dependent heat conduction by analytical methods. Numerical solution of heat conduction equation.

ME 521 THERMODYNAMICS I (3)

SEC. 001

TEXT: Richard E. Sonntag, Claus Borgnakke and Gorgon J. Van Wylen, Fundamentals of Thermodynamics, Sixth Edition, John Wiley & Sons, Inc., 2003.

TIME: Monday & Thursday 9:15 – 10:30 E112

PROFESSOR: Dr. Frank Collins

Macroscopic thermodynamics, including First and Second Law analyses and applications, availability, phase and chemical equilibrium, combustion, gas and liquid mixtures, property relations, determination of thermodynamic properties from molecular structure and spectroscopic data.

*ME 525 COMBUSTION AND CHEMICALLY REACTING FLOWS (3) **CANCELLED**

SEC: 001

TEXT: TBD

TIME: Tuesday & Friday 9:15 – 10:30 E211

PROFESSOR: Dr. Roy Schulz

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

laminar streams; flammability limits of premixed laminar flames; introduction to turbulent flames. Prereq: 522 and 541 or consent of instructor.

ME 540 PERTURBATION METHODS IN ENGINEERING (3)
SEC. 001
TEXT: Class Notes
TIME: Monday & Thursday 3:00 – 4:15 B112
PROFESSOR: Dr. Joseph Majdalani

Solution of nonlinear problems in solid and fluid mechanics and dynamics by use of asymptotic perturbation techniques. Asymptotic expansions, regular and singular perturbations and applications in dynamics, celestial mechanics, potential, viscous and compressible flows. Uniformly valid approximations in various physical problems. Generalized boundary-layer techniques; Poincare's method. Matched asymptotic expansions and multiple scales. Problems with several time or length scales. Examples taken from various fields of science. Prereq: Calculus or consent of Instructor.

ME 541 FLUID MECHANICS I (3)
SEC. 001 (Same as AE 541 & ES 541)
TEXT: R.L. Panton: Incompressible Flow; Wiley Interscience; 3rd Ed.; ISBN# 047126122X
TIME: Tuesday & Friday 1:00 – 2:15 E211
PROFESSOR: Dr. Basil Antar

Derivation of equations governing flow of inviscid and viscous fluids (conservation of mass, Newton's second law, conservation of energy). Equations of state and constitutive relations. Euler and Navier-Stokes forms and nondimensionalization. Exact solutions and introduction to potential and boundary-layer flows. Prereq: AE 511 or equivalent, or consent of instructor.

*ME 551 MECHANICAL DESIGN (3) **CANCELLED**
SEC. 001
TEXT: Class Notes/Handouts
TIME: Tuesday & Friday 7:45 – 9:00 E211
PROFESSOR: Dr. Louis Deken

This course concentrates on the theoretical background and application of structural analysis for mechanical design. Topics will include: moment-area, elastic weights, virtual work, slope deflection, matrix methods and the basics of the finite element method. The techniques will be used to determine stresses, reactions and deflections of structural/mechanical systems. The analysis principles will be presented and attention will focus on the application and limitations imposed by the assumptions.

ME 562 COMPUTATIONAL FLUID DYNAMICS (3)
SEC. 001 (Same as AE 572 & ES 552)
TEXT: TBD
TIME: Monday & Thursday 4:00 – 5:15 B210
PROFESSOR: Dr. John Steinhoff

Modern techniques in computing fluid dynamic flows will be covered. First, different classes of flows will be reviewed, and the most appropriate methods that satisfy both the physics requirements (capture the essential physics), and the engineering requirements (time required to set up and compute solutions) will be discussed. Methods suited for general configurations (blunt bodies) and methods suited for streamlined bodies, such as aircraft will be contrasted. The types of problems for which incompressible methods or compressible methods are best used, as well as those for which turbulence modeling is required will be covered. Accuracy issues and requirements will be covered, both for fully resolved flows and flows where turbulence modeling is needed. Particular equations to be covered include Potential, Euler, and (for laminar flow)

Navier Stokes, as well as “Large Eddy Simulation” and “Reynolds Averaged Navier Stokes” for modeling turbulent flows. For compressible flows, methods involving shock capturing, with higher order schemes and limiters will be covered. For general flows, methods involving efficient treatment of concentrated vortices, passive scalar transport, as well as free surfaces will also be covered.

ME 581 ROCKET PROPULSION I (3)
SEC. 001
TEXT: TBD
TIME: Tuesday & Friday 10:45 – 12:00 E210
PROFESSOR: Dr. Gary Flandro

This course covers rocket propulsion fundamentals; thermodynamics of non-reacting and chemically reacting ideal gases, rocket nozzle design; ideal rocket performance parameters; rocket heat transfer; chemistry of propellants; liquid rocket engine systems; ground testing; introduction to solid propellant rockets.

ME 584 TURBOMACHINERY I (3)
SEC. 001
TEXT: Jack D. Mattingly: Elements of Gas Turbine Propulsion; AIAA Educator Series, Latest ed., ISBN# 1-56347-778-5
TIME: Tuesday & Thursday 4:00 – 5:15 E112
PROFESSOR: Dr. Milt Davis

The course will provide a review of gas dynamics, an analysis of ideal cycle analysis of turbine engines along with engine design concepts. Methods for analyzing engine performance for turbojets, turbofans and turboprops will be studied for both ideal and real cycles. The course will emphasize the use of numerical simulations as tools for use in analyzing gas turbine engine performance and connect engine testing with analysis processes.

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

Enrollment limited to students in the problems option. (Grading Restriction: Satisfactory/No Credit grading only). Registration Permission: Consent of advisor.

ME 595 SEMINAR: AEROSPACE AND MECHANICAL SYSTEMS (1)
SEC. 001 PROFESSOR: Dr. Ahmad Vakili

ME 599 SPECIAL TOPICS: SOLID STATE PHYSICS (1 – 3)
SEC. 001 (Same as Physics 555)
TEXT: Classic books on Solid State Physics such as Kittel, Introduction to Solid State Physics, main course book: N.W.Ashcroft, N.D. Mermin, “Solid State Physics” Holt Saunders, ISBN: 0-03-083993-9 and on-line refs. such as <http://www.phys.ufl.edu/fermisurface/> (Kronig Penney model) or electronic lecture notes such as UCL: Solid State Physics <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/index.html> and specifically the e-book <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/notes.pdf> and additional electronic notes <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/HighTc.pdf> and <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/HTSCnotes.pdf>
TIME: Monday & Thursday 1:00 – 2:15 F252
PROFESSOR: Dr. Christian Parigger

Elementary solid state physics. Crystal structures, reciprocal lattice, bonding in solids, energy bands, semiconductors, phonons, free-electron-gas theory of metals, superconductivity, magnetism, and other forms of broken symmetry. (see <http://web.utk.edu/%7Eginfo/phys.htm>) for electronic catalog. Specifically, sections for college of arts & science: http://diglib.lib.utk.edu/dlc/catalog/images/g/2005/g_as.pdf for college of engineering: http://diglib.lib.utk.edu/dlc/catalog/images/g/2005/g_eng.pdf and for courses: http://diglib.lib.utk.edu/dlc/catalog/images/g/2005/g_courses.pdf

*ME 599 SPECIAL TOPICS IN ME: ENGINE INLET INTEGRATION (3) **CANCELLED**
 SEC. 006
 TEXT: Practical Intake Aerodynamic Design ; E. 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; Second Edition; 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 10:45 - 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 HYBRID ROCKET PROPULSION (3)
 SEC 007
 TEXT: Fundamentals of Hybrid Rocket Combustion and Propulsion
 TIME: Tuesday and Friday 1:00-2:15 Room: TBD
 PROFESSOR: Dr. Joseph Majdalani and Mr. Paul Gloyer

This course reviews the fundamentals of hybrid rocket propulsion with special emphasis on application-based design and system integration, propellant selection, flow and regression rate modeling, solid fuel pyrolysis, scaling effects, transient behavior, and combustion instability. Advantages and disadvantages of both conventional and swirl-driven vortex hybrid configurations are examined. Course includes testing of laboratory-scale hybrid rockets. Prereq: ME 581, or instructor's consent.

ME 600 DOCTORAL AND RESEARCH DISSERTATION (3 - 15)
 SEC. 015 Schulz
 016 Vakili
 017 Majdalani
 018 Steinhoff
 019 Flandro
 020 Antar

PHYSICS

PHYS 500 MASTER'S THESIS (3, 6, or 9)
 SEC. 002 Crater
 003 Lewis
 004 Parigger
 005 Chen
 006 Davis
 007 McGregor

PHYS 503 PHYSICS COLLOQUIM (1)
SEC. 002 (REQUIRED OF ALL PHYSICS STUDENTS)
TEXT: No text required for this course
TIME: Thursday 3:30 - 5:00 CLA Conference Room
PROFESSOR: Dr. Lloyd Davis

Physics seminar presentations of current topics by students, faculty, and invited speakers.

PHYS 505 PHYSICS OF FLUIDS (3)
SEC. 002
TEXT:TBD
TIME: TBD
PROFESSOR: Dr. Ying-Ling Chen

Fluid physics, overview of fluid mechanics and associated computational techniques; general description of laminar and turbulent flows; subsonic, supersonic and hypersonic flows; continuum, transitional and free-molecular flows; pipe flow, nozzle flow and sonic orifice expansion flows; reacting and nonreacting flowfields; shock-tube physics; and introduction to method of characteristics and Monte Carlo computational techniques.

The contents of this course will concentrate on the physics of fluids with specific focus on propulsion applications. A systematic and careful delineation of the principles of physics applications to propulsion will include specific topics of electrodynamics, quantum mechanics, statistical mechanics, and mechanics. Instructor's notes and related publications will supplement the material of physics textbooks.

PHYS 506 EXPERIMENTAL METHODS (3)
SEC: 002
TEXT: Class Notes
TIME: Monday & Thursday 10:45 – 12:00 CLA Lab
PROFESSOR: Drs. Davis/Chen/Parigger

Introduction to experimental methods of spectroscopy through hands on operation of FTIR, Raman, NMR, photo-electron, laser and mass spectrometers. Principles and hazards of cw and pulsed lasers, radiation detectors, photomultiplier tubes, image intensifiers, image converters; high-vacuum systems including cryogenic based devices, data acquisition techniques including lock-in amplifiers, box-car integrators, digital electronics methods and micro-computer data acquisition.

PHYS 508 LASER PHYSICS (3)
SEC. 002
TEXT: William T. Silvast, Laser Fundamentals, ISBN# 0-521-55617-1
Other texts and notes also
TIME: TBD
PROFESSOR: Dr. Lloyd Davis

Mode analysis, stable and unstable resonators; rate equations in population inversion, saturation, relaxation oscillations, fluctuations and noise, laser stability; quantum theory of laser, photon coherence; mode-locking, Q-switching and frequency stabilization; specific laser types: semiconductor and solid-state, excimer, copper vapor and dye lasers.

PHYS 513 PROBLEMS IN THEORETICAL PHYSICS I (3)
SEC. 002 (Interactive from UTK, Distance Ed)
TEXT: Check with Instructor
TIME: Wednesday 11:15 – 12:30 (EST) E113

PROFESSOR: Dr. Marianne Breinig (UTK Faculty)

Fundamentals of physics: classical mechanics (Newtonian mechanics, Lagrangian and Hamiltonian dynamics) and electrostatics and magnetostatics.

PHYS 521 QUANTUM MECHANICS (3)
SEC. 002

TEXT: Sakurai: Modern Quantum Mechanics; Addison Wesley

TIME: Monday & Thursday 9:15 - 10:30 B-112

PROFESSOR: Dr. Horace Crater

Fundamental principles of quantum mechanics, free particle, harmonic oscillator, hydrogenation, angular momentum, electron spin, particles in electric and magnetic fields, perturbation theory, variational methods, scattering theory. Application of quantum mechanics to problems of atomic, molecular, nuclear, and solid state physics. Prereq: 531, 571.

PHYS 531 CLASSICAL MECHANICS (3)

SEC. 002 Videotaped at UTSI

TEXT: Goldstein: Classical Mechanics; Addison Wesley

TIME: Monday & Thursday 2:30 - 3:45 E-112

PROFESSOR: Dr. Horace Crater

Classical particle dynamics, variational formulation, Lagrange's and Hamilton's equations, conservation laws, central-force problems and scattering, small oscillations, rigid-body motion, constraints. Prereq: Mechanics.

PHYS 555 SPECIAL TOPICS: SOLID STATE PHYSICS (1 – 3)

SEC. 001 (Same as ME599)

TEXT: Classic books on Solid State Physics such as Kittel, Introduction to Solid State Physics, main course book: N.W.Ashcroft, N.D. Mermin, "Solid State Physics" Holt Saunders, ISBN: 0-03-083993-9 and on-line refs. such as <http://www.phys.ufl.edu/fermisurface/> (Kronig Penney model) or electronic lecture notes such as UCL: Solid State Physics <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/index.html> and specifically the e-book <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/notes.pdf> and additional electronic notes <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/HighTc.pdf> and <http://www.cmmp.ucl.ac.uk/~aph/Teaching/3C25/HTSCnotes.pdf>

TIME: Monday and Thursday 1:00 – 2:15 F252

PROFESSOR: Dr. Christian Parigger

Elementary solid state physics. Crystal structures, reciprocal lattice, bonding in solids, energy bands, semiconductors, phonons, free-electron-gas theory of metals, superconductivity, magnetism, and other forms of broken symmetry. (see <http://web.utk.edu/%7Eginfo/phys.htm>) for electronic catalog. Specifically, sections for college of arts & science: http://diglib.lib.utk.edu/dlc/catalog/images/g/2005/g_as.pdf for college of engineering: http://diglib.lib.utk.edu/dlc/catalog/images/g/2005/g_eng.pdf and for courses: http://diglib.lib.utk.edu/dlc/catalog/images/g/2005/g_courses.pdf

PHYS 571 MATHEMATICAL METHODS IN PHYSICS (3)

SEC. 002

TEXT: TBD

TIME: Monday & Thursday 9:15 – 10:30 E211

PROFESSOR: Dr. Christian Parigger

Linear vector spaces, matrices, tensors, curvilinear coordinates, functions of a complex variable, partial differential equations and boundary value problems, Green's functions, integral

transforms, integral equations, spherical harmonics, Bessel functions, calculus of variations.
Prereq: Advanced calculus and differential equations. Must be taken in sequence.

PHYS 593 INDEPENDENT STUDY (1)
SEC. 003
TEXT: Paras N. Prasad; Nanophotonics; ISBN# 0-471-64988-0
TIME: Wednesday 7:30 – 8:45 TBD
PROFESSOR: Dr. Lloyd Davis

Topics in Classical Physics.

PHYS 593 INDEPENDENT STUDY: MODELING HUMAN EYE (1 – 3)
SEC. 004
TEXT: Contemporary Journal Papers
TIME: Tuesday & Friday 12:00 – 1:15 CLA Room 106
PROFESSOR: Dr. Ying-Ling Chen

Contemporary models of the human eye will be presented. Vision deficiencies will be studied using computational models of ocular imperfections. Methods of optical detection of ocular imperfections and their quantification will be explored using computer simulations.

***PHYS 593 FLUID PHYSICS (3) CANCELLED**
SEC. 006
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. Ying-Ling Chen

The contents of this course will concentrate on the physics of fluids with specific focus on propulsion applications. A systematic and careful delineation of the principles of physics applications to propulsion will include specific topics of electrodynamics, quantum mechanics, statistical mechanics, and mechanics. Instructor's notes and related publications will supplement the material of physics textbooks.

PHYS 594 SPECIAL PROBLEMS (3)
SEC. 002
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. Horace Crater

Especially assigned theoretical or experimental work on problems not covered in other courses.

PHYS 594 OPTICS OF VISION (3)
SEC. 003
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. Ying-Ling Chen

The prediction of the optical quality of human vision is a contemporary research area of biophysics. The challenges are the description of both healthy and diseased, or abnormal, eyes, and verification of the predictions. Research at UTSI has made significant progress in these areas, but the inclusion of realistic models of the retina has yet to be accomplished. This research-related course will focus on retinal optical properties of the human eye with particular emphasis on the rod/cone structure of the retina and the Stiles-Crawford effect. Current papers and computations will be used to provide the basis for verification with human data.

PHYS 599 SEMINAR IN MODERN PHYSICS: FLUORESCENCE SPECTROSCOPY (1)
SEC. 008
TEXT: J.R. Lakowicz , “Principles of Fluorescence Spectroscopy,” and also assigned papers on single-molecule spectroscopy from the literature
TIME: Wednesday 8:45 – 10:00 CLA Lab
PROFESSOR: Dr. Lloyd Davis

PHYS 600 DISSERTATION (1 - 15)
SEC. 002 Crater
003 Lewis
004 Parigger
005 Chen
006 Davis

*PHYS 601 ATOMIC PHYSICS (3) **CANCELLED**
SEC. 001

TEXT: Classic books, on-line references, lecture and lab notes. (1)Review books include B.H.Brandsden, C.J. Joachain, “Physics of Atoms and Molecules,” ISBN 0-582-44401-2; S. Svanberg, “Atomic and Molecular Spectroscopy,” ISBN 0-387-55243, 2-nd ed.; I.D. Lawrie, “A Unified Grand Tour of Theoretical Physics,” ISBN 0-85274-014; W.Greiner, B. Müller, J. Rafelski, “Quantum Electrodynamics of Strong Fields,” ISBN 0-387-23404-2; (2) PROLA (Physical Review Online Archive) <http://prola.aps.org> and other literature, (3) <http://physicsweb.org/bestof/atomic> and other current Atomic, Molecular and Quantum Physics references. Main course book to be selected.

Some of the topics of current interest include [IOP Vision Paper: Quantum information](#), [Fundamental physical constants](#), [Introduction to Bose-Einstein condensation](#), [The Bose-Einstein Condensation \(BEC\) homepage](#), [Atom traps world wide](#), [Superluminal light propagation](#), [Oxford Centre for Quantum Computation](#), [Quantum physics at the University of Vienna](#), [Max Planck Institute for Quantum Optics](#), [Quantum optics at Caltech](#), [Atomic, molecular and optical physics at JILA](#).

TIME: Tuesday & Friday 1:00 - 2:15 F252
PROFESSOR: Dr. Christian Parigger

Survey of research problems and methods. Topics of current interest intended for all graduate students. 602 - Advance problems for students specializing in field.

PHYS 606 Nonlinear Optics (3)
SEC. 001

TEXT: R.W. Boyd; Nonlinear Optics: ISBN#10-121216802, ISBN# 12-978-0121216801
TIME: Tuesday & Friday 9:15 – 10:30 F253
PROFESSOR: Dr. Christian Parigger

Nonlinear optical susceptibilities, wave propagation in nonlinear media, sum-frequency and difference frequency generation, harmonic generation, parametric amplification and oscillation, stimulated Raman processes, two- and Multi-photon processes, four-wave mixing and phase conjugation, transient coherent optical effects and free induction decay, optical breakdown and nonlinear effects in plasmas. Prereq: 522.

*PHYS 611 ADVANCED QUANTUM MECHANICS AND FIELD THEORY (3) **CANCELLED**
SEC: 002

TEXT: TBD
TIME: Tuesday & Friday 7:45 – 9:00 F253
PROFESSOR: Dr. Christian Parigger

Survey of problems and methods. Topics of current interest. Intended for all graduate students.

PHYS 642 ADVANCED TOPICS IN MODERN PHYSICS (3)
SEC. 004
TEXT: TBD
TIME: TBD
PROFESSOR: Dr. Horace Crater

Advanced theoretical or experimental topics not covered in other courses.

Fall 2007

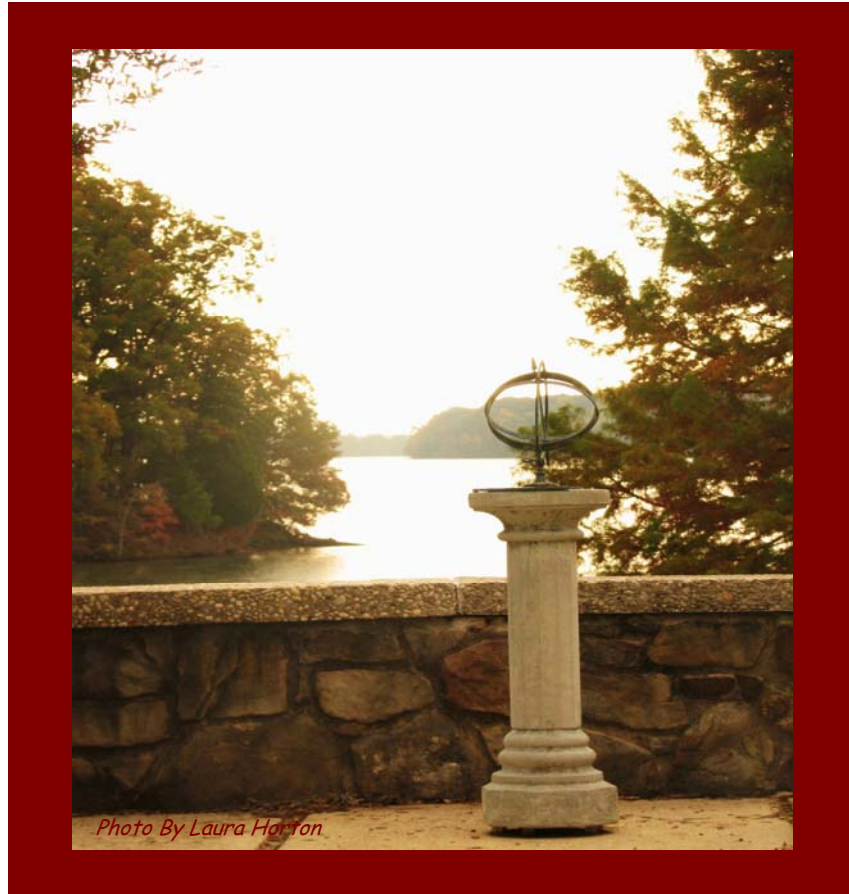


Photo By Laura Horton

Registration Announcement

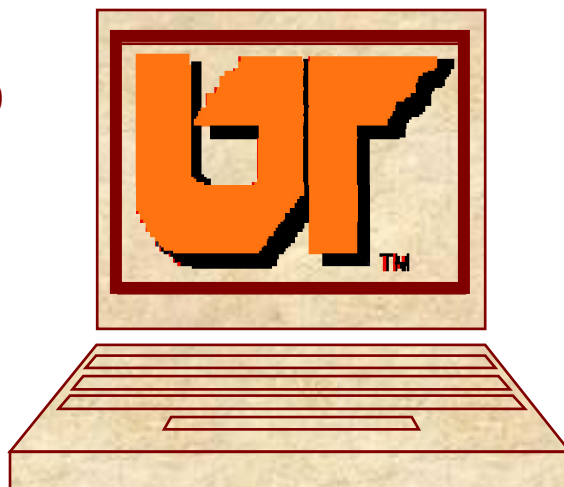
411 B.H. Goethert Parkway
Tullahoma, TN 37388-9700

888-822-8874 x228

www.utsi.edu

On-Line Registration
Instructions
Inside

<http://cpo.utk.edu>



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