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CALENDAR --- FALL SEMESTER 2008

Priority Registration	March 10 – August 12, 2008
Fall 2008 Graduation Application Deadline.....	August 7, 2008
Admission to Candidacy Forms due for Fall 2008 Commencement.....	August 7, 2008
Late Registration and late fees begin	August 13-August 29, 2008
Classes begin	August 20, 2008
Last Day to drop without “W” on the transcript, change to/from audit, add a course without the instructor’s signature	August 29, 2008
Labor Day Holiday.....	September 1, 2008
Graduation Fee Payment Deadline.....	September 22, 2008
Last day to add/change credit or grading options with signatures.....	September 30, 2008
Fall Break (No Classes).....	October 9 & 10, 2008
Last day to meet with consultant for Thesis/Dissertation Preliminary Review	October 17, 2008
Tentative deadline to purchase cap/gown and order hood.....	October 24, 2008
Last day to register to attend graduate hooding.....	October 31, 2008
Last day to schedule final exam (thesis).....	October 24, 2008
Last day to schedule final exam (non-thesis/capstone students)	October 24, 2008
Last day to schedule final exam (dissertation)	October 31, 2008
Last day to take final exam (thesis/dissertation students).....	November 7, 2008
Last day to take final comprehensive exam (non-thesis/capstone students).....	November 7, 2008
Last day to drop with a “W” full session courses.....	November 11, 2008
Thesis/Dissertation Deadline (Electronic)	November 21, 2008
Report of thesis/dissertation defense or final examination (Pass/Fail Form)	November 21, 2008
Thanksgiving Holiday	November 27 & 28, 2008
Deadline for submission of Admission to Candidacy for students graduating Spring 2009	December 2, 2008
All “INCOMPLETES” must be removed for Graduation.....	December 2, 2008
Classes End	December 2, 2008
Total withdrawal from the University Deadline.....	December 2, 2008
Study Period	December 3, 6 & 7, 2008
Exam Period	December 4, 5 & 8-11, 2008
Graduate Hooding (UTK)	December 12, 2008
COMMENCEMENT (UTK).....	December 13, 2008
Second thesis/dissertation deadline (Student will receive diploma May 2008 but do not have to register for Spring 2009) (Defense Completed by December 2)	December 31, 2008

SPRING SEMESTER 2009

Priority Registration for Spring Semester 2009 begins at UTK	September 29, 2008
Final Registration for UTSI students	TBD
Classes begin	January 7, 2009
Martin Luther King Day (Holiday)	January 19, 2009
Spring Break.....	March 16 – 20, 2009
Spring Recess - Good Friday Holiday.....	April 10, 2009
Classes End	April 24, 2009
Study Period	April 27 (25&26), 2009
Exam Period	April 28, 29, 30, & May 1, 2009
Graduate Hooding Ceremony (UTK).....	May 7, 2009
Commencement (UTK).....	May 8, 2009

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

LAST DAY OF CLASSES.....December 2, 2008

STUDY PERIOD December 3, 6, and 7, 2008

FINAL EXAMS - - - December 4, 5 and 8, 9, 10 and 11, 2008

REGULAR CLASS TIME (Same Classroom) EXAM TIME

1ST Day - Thursday, December 4, 2008

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 5, 2008

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 8, 2008

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 2008

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 2008 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 10, - August 12, 2008. Late registration will be August 13 – August 29, 2008. Classes begin August 20, 2008.

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 1, 2008
Statement information available on CPO.utk.edu	August 4, 2008
Priority registration, payment/confirmation deadline	August 12, 2008 (4:30 p.m. CST)
Late registration/late fees begin	August 13, 2008
Late registration payment/confirmation deadline	August 29, 2008 (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 13, 2008. 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.	Gregory Sedrick	931-393-7292	gsedrick@utsi.edu

TUITION AND/OR MAINTENANCE FEES*

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

Maintenance Fee	\$3,131.00*
Programs and Services Fee	\$90.00
Total	\$3,221.00

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

Maintenance Fee	\$3,131.00*
Programs and Services Fee	\$90.00
Tuition	\$6,329.00*
Total	\$9,550.00

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

TUITION FOR PART-TIME STUDENTS

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

IN-STATE	\$ 348.00 per semester hour
3 hrs.	\$ 1,044.00
OUT-OF-STATE	\$ 1052.00 per semester hour
3 hrs.	\$ 3,156.00

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, 2008) day of the semester. All financial aid monies must be applied to fees before a deferment will be considered. A deferred payment service fee of \$20.00 is assessed when any portion of tuition, fees, and other charges are deferred with the approval of the Business Office. An additional \$35.00 late payment charge will be assessed if the second installment is not paid on or before the due date. For more details, contact the Business Office.

LATE PAYMENT FEES

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

TUITION/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 20 – August 24	NO CHARGE	100%
August 25 – August 30	20% CHARGE	80%
August 31 – September 4	40% CHARGE	60%
September 3 – September 9	60% CHARGE	40%
September 10 – 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 2008 must remove all **INCOMPLETE GRADES** by **December 2, 2008**.

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

REPEATING A COURSE

No graduate student may repeat a course for the purpose of raising a grade already received, with the exception of a NC course. A graduate student cannot do additional work nor repeat an examination to raise a final grade.

ADMISSION TO CANDIDACY

MASTER OF SCIENCE DEGREE:

Each M.S. student, including IE Capstone Project students, is responsible for submitting to the Registrar's Office a completed and signed Application for Admission to Candidacy form at least one semester prior to receiving the degree.

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

ADMISSION TO CANDIDACY

DOCTOR OF PHILOSOPHY DEGREE:

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

CONTINUOUS REGISTRATION OF DOCTORAL STUDENTS

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

FINAL EXAMINATION FOR NON-THESIS, CAPSTONE PROJECT STUDENTS, THESIS AND DISSERTATION STUDENTS

A candidate presenting a thesis or dissertation must pass a final oral examination on all work offered for the degree. The examination is scheduled through the Registrar's Office. Failure to notify the Registrar's Office of the examination date will put the student at risk for graduating that semester. Final examinations not properly scheduled MUST be repeated. The final draft of the thesis must be distributed to the committee members at least two weeks prior to the date of the final examination. In case of a grade of "Fail", the candidate may not apply for re-examination until the following semester. The result of the second examination is final.

UT POLICY ON INSURANCE FOR INTERNATIONAL STUDENTS

All foreign national students registered with UTSI, are required to have comprehensive medical insurance. The policy for the 2008 - 2009 academic year will be announced in August 2008. 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.

FINAL EXAM DATES FOR FALL SEMESTER 2008

STUDY PERIOD...December 3, 6, and 7, 2008

FINAL EXAMS.....December 4, 5, and 8, 9, 10 and 11, 2008

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 6:00 – 8:00

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 2008 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) **CANCELLED**

SEC. 001

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

TIME: Monday & Thursday 1:00 – 2:15 E211

PROFESSOR: Dr. Ahmad Vakili

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

AE 515 AIR VEHICLE AERODYNAMICS AND PERFORMANCE (3)

SEC. 001

TEXT: TBD

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

PROFESSOR: Dr. Roy Schulz

Application of aerodynamics principles to air vehicles to provide estimates of performance, stability, and control characteristics for subsonic to hypersonic speeds. Relations among thrust, drag, lift and attitude, propulsion systems, vehicle performance characteristics, and trajectory optimization. *Prerequisite(s): 422.*

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. *Prerequisite: 422.*

*AE 525 HYPERSONIC FLOW (3) **CANCELLED**
SEC. 002
TEXT: TBD
TIME: Tuesday & Friday 7:45 – 9:00 B210
PROFESSOR: Dr. Roy Schulz

Slender body flow; similitude; Newtonian theory; blunt body flow; viscous interactions; free molecule and rarefied gas flow. *Prerequisite(s): 512.*

*AE 527 AEROSPACE GROUND TEST FACILITIES (3) **CANCELLED**
SEC. 001
TEXT: Instructor Lecture Notes and Short Course Notes
TIME: Tuesday & Friday 10:45 – 12:00 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. *Prerequisite(s): 521, 541 and Mechanical Engineering 522.*

AE 531 MAGNETOHYDRODYNAMICS (3)
SEC. 002 (Same as ECE 599 Section 010)
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: Monday & Thursday 10:45 – 12:00 F252
PROFESSOR: Dr. Trevor Moeller

This course will also address 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. Electromagnetic field theory; chemical kinetics; thermodynamic and thermophysical properties of gas plasmas; governing equations and applications. *Prerequisite(s): 422 and Mathematics 471.*

AE 539 CONTINUUM MECHANICS (3)
SEC. 001 (Same as ES 539 & ME 539)
TEXT: TBD
TIME: Tuesday & Friday 1:00 – 2:15 B112
PROFESSOR: Dr. Trevor Moulden

Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics. (*Same as Engineering Science 539; Biomedical Engineering 539; Mechanical Engineering 539.*)

AE 541 FLUID MECHANICS I (3)
SEC. 001 (Same as ES 541 & ME 541)
TEXT: R.L. Panton: Incompressible Flow; Wiley Interscience; 3rd ISBN# 047126122X
TIME: Tuesday & Friday 9:15 – 10:30 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. (*Same as Engineering Science 541; Mechanical Engineering 541*). Prerequisite: AE 511 or equivalent, or consent of instructor.

*AE 571 FINITE ELEMENTS FOR ENGINEERING APPLICATIONS (3) **CANCELLED**
SEC. 009 (Same as ES 551 & ME 561)
TEXT: Class Notes/Handouts
TIME: Tuesday & Friday 1:00 – 2:15 E210
PROFESSOR: Dr. Roy Schulz

Modern computational theory applied to conservation principles across the engineering sciences. Weak forms, extremization, boundary conditions, discrete implementation via finite element, finite difference, finite volume methods. Asymptotic error estimates, accuracy, convergence, stability. Linear problem applications in 1, 2 and 3 dimensions, extensions to non-linearity, non-smooth data, unsteady, spectral analysis techniques, coupled equation systems. Computer projects in heat transfer, structural mechanics, mechanical vibrations, fluid mechanics, heat/mass transport. (*Same as Biomedical Engineering 561; Mechanical Engineering 561; Engineering Science 551*). Comment(s): Bachelor's degree in engineering or natural science required.

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. (*Same as Engineering Science 552; Mechanical Engineering 562*).

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

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

AE 600 DOCTORAL RESEARCH AND DISSERTATION (3, 6, 9)
SEC. 004 Schulz
005 Vakili
006 Majdalani

007 Steinhoff
008 Flandro
009 Antar
010 Corda

*AE 661 ADVANCED TOPICS IN COMPUTATIONAL FLUID DYNAMICS (3) **CANCELLED**
SEC. 001 (Same as ES 651 & ME 651)
TEXT: TBD
TIME: Monday & Thursday 2:30 – 3:45 E210
PROFESSOR: Dr. Roy Schulz

Modern approximation theory for Euler and Navier-Stokes conservation systems, compressible flow, hyperbolic forms, boundary conditions. Weak forms, extremization, finite element/finite volume/flux vector discrete implementations, a priori error estimates, accuracy, convergence stability. Numerical linear algebra, approximate factorization, sparse matrix methods. Dissipation, Fourier spectral analysis, smooth and non-smooth solutions. (*Same as Engineering Science 651; Mechanical Engineering 651*). *Prerequisite(s): 552.*

*AE 681 ADVANCED VISCOUS FLOW THEORY (3) **CANCELLED**
SEC. 001
TEXT: TBD
TIME: Monday & Thursday 2:30 – 3:45 B210
PROFESSOR: Dr. Trevor Moulden

Critical review of significance to governing equations. Nature of boundary layer approximation as singular perturbation problem. Uniqueness and existence of solutions. Applications of group theory. Special problem areas of interest to students. *Prerequisite(s): 512, Continuum Mechanics and Mathematics 562.*

AE 690 ADVANCED TOPICS IN AEROSPACE ENGINEERING:
ADVANCED PERTURBATION METHODS (3)
SEC. 001
TEXT: Class Notes
TIME: Tuesday & Friday 3:00 – 4:15 B210
PROFESSOR: Dr. Joseph Majdalani

Objectives: The purpose of this course is to advance students through real life problems requiring the subtle use of asymptotic methods. The goal is to solve problems that arise in propulsion related applications or other fields of science. By the end of the course students will be able to: understand the use of several advanced perturbation techniques; these include:

- 1) WKB Method (Type I and Type II) with Multiple Distinguished Limits
- 2) Latta's Method of Composite Expansions
- 3) Method of Averaging (van der Pol's Method/ Krylov-Bogoliubov Method)
- 4) Asymptotic Expansion of Integrals (Watson's Lemma)
- 5) Laplace's Method

obtain perturbation solutions to complex physical settings involving small or large parameters; understand how to model highly oscillatory solutions; treat partial differential equations; treat problems exhibiting a nonlinear scaling structure; treat compressible flow problems. *Prerequisites: Differential Equations and Perturbation Methods I.*

AVIATION SYSTEMS

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

AS 502 REGISTRATION USE OF FACILITIES (1 –15)
SEC. 001 Corda
002 Solies
003 Collins
004 Ranaudo
005 Muratore
007 Pujol

AS 503 AIR VEHICLES (3)
SEC. 001 (Video Recorded)

TEXT: Roskam, J, and Lan, E. C.-T.; Airplane Aerodynamics and Performance; any edition;
Roskam Aviation and Engineering Corporation; Ottawa, Kansas, 1981, 1988, or 2000.

TIME: Tuesday & Friday 1:00 – 2:15 E112

PROFESSOR: Dr. Peter Solies

Current capabilities and future requirements for civilian and military air vehicles. Parameters significant for air vehicle type selection, integration of air vehicle into aviation systems.

COMMENT: The course focuses on the study of air vehicles as they evolved to enable human flight or unmanned flight missions. In a historical review the development of aviation technology, mission requirements, and economical aspects are emphasized. Fundamentals of aerodynamic principles and their application to air vehicles will be developed to determine performance in level flight, climb, glide and maneuvering flight, as well as characteristic parameters as range and endurance. The state of the art of present air vehicles is investigated, as well as current problems in aviation and possible solutions.

AS 508 FLIGHT TEST INSTRUMENTATION (3)

SEC. 003

TEXT: TBD

TIME: Monday & Thursday 1:30 – 2:45 H111

PROFESSOR: John Muratore

Principles of measurement, measuring devices with views toward both ground and flight aerospace testing: measurement fundamentals, sensors for specific parameters (e.g. temperature, heat flux, flow rate, pressure, acceleration, vibration, strain, and humidity), data bus integration, signal condition, telemetry, and fabrication.

COMMENT: The objective of this course is to familiarize the student with the principles of flight test instrumentation sufficient to allow the student to plan and instrument an aircraft to conduct a series of tests. Subjects to be covered include basic principles of measurement theory, components of an instrumentation system, specific sensors used for flight test and the signal conditioning required to deal with typical flight test sensors. The class will also cover interfacing and data acquisition with digital sensors that output their results in computer compatible format such as serial data streams. The class will make extensive use of LabVIEW to experiment with

sensors and instruments in the laboratory and then will take selected instruments into UTSI aircraft for flight experience. This class is offered only to resident graduate students.

AS 510 SPECIAL TOPICS IN AVIATION SYSTEMS: INTRODUCTION TO AVIONICS I (3)
SEC 001 (Video Recorded)
TEXT: Avionics Training: Systems, Installation and Troubleshooting; Len Buckwalter; Avionics Communications, Inc.; Latest Ed.; ISBN# 1-88-5544-21-9
TIME: Tuesday & Friday 10:30 – 12:00 E113
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 515 AVIATION HUMAN FACTORS (3)
SEC 001 (Interactive from UTK)
TEXT: Human Factors in Aviation; Earl L. Wiener and David C. Nagel; ISBN# 0-12-750031-6.
TIME: Tuesday & Thursday 10:15 – 11:30 E112
PROFESSOR: Professor Richard Ranaudo

Human factors pertinent to aviation: concept of human factors, human error, fatigue, body rhythms, performances, motivation, vision and visual illusions, communication, attitudes, training devices, displays and controls, crew systems integration, system safety, workload, Human Factors evaluation methods. Applications to various aviation operations.

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: Drs. Stephen Corda/Peter Solies and John Muratore

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. *Prerequisite: AS 521 Fixed Wing Performance or consent of instructor.*

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

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

COMPUTER SCIENCE

CS 471 NUMERICAL ANALYSIS (3)
SEC. 001 (Video Recorded) (Same as Math 471)
TEXT: TBD
TIME: Monday & Wednesday 2:30 – 3:45 E112
PROFESSOR: Dr. Trevor Moulden

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. *Prerequisite: Numerical Algorithms I or consent of instructor.*

CS 594 SPECIAL TOPICS: INTRODUCTION TO COMPUTER SCIENCE FOR
COMPUTATIONAL SCIENTISTS (3)
SEC. 010
TEXT: TBD
TIME: Tuesday & Friday 1:00 – 2:15 E211
PROFESSOR: Dr. Bruce Whitehead

This course is necessary to meet the Computer Science requirement for the Interdisciplinary Graduate Minor in Computational Science (IGMCS) at UTSI. Students in any field are welcome in the course, whether or not interested in IGMCS. Topics include basic data structures, effective compiler toolchain use, Fortran/C interoperability, concurrency, parallel computing models & application programming interfaces (APIs), and cluster computing. *Prerequisite: Students are expected to enter this course already proficient in either C or Fortran programming, but not necessarily both.* If you don't yet know either language, the best one to learn for this course is C, and a good tutorial is available at http://www.physics.drexel.edu/courses/Comp_Phys/General/C_basics/. For further information about this course or about the IGMCS program at UTSI, please contact Dr. Whitehead at bwhitehe@utsi.edu or 931-393-7296.

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 555 EMBEDDED SYSTEMS (3)

SEC. 004

TEXT: Embedded Systems: A Contemporary Design Tool; James K. Peckol; 1st Edition; University of Washington; ISBN # 978-0-471-72180-2.

TIME: Tuesday & Friday 10:45 – 12:00 F253

PROFESSOR: Dr. Bruce Bomar

Design principles, analysis methods and case studies of microprocessor-based and time-critical embedded systems, such as sensor and actuator networks, multimedia devices and avionics. Topics include real-time operating systems, single-processor scheduling, multi-processor scheduling, and distributed systems, quality of service, resource management, end-to-end processor utilization control, embedded middleware, power-aware computing, energy management, and fault-tolerance. *Followed in Spring 2009 by 556 Wireless Sensor Networks.*

ECE 572 DIGITAL IMAGE PROCESSING (3)

SEC. 004

TEXT: Image Processing: Theory, Algorithms and Architecture; M. A. Sid-Ahmed; McGraw-Hill; 1st Edition; ISBN# 0-07-057240-2

TIME: Monday & Thursday 9:15 – 10:30 F252

PROFESSOR: Dr. L. Montgomery Smith

Recent advances in computers, displays and data communications have given rise to a need for more complete understanding of the basic principles regarding image processing and manipulation. While in the past, many of the concepts of image processing were lost in the “nuts and bolts” of image display and data storage, the current availability of hardware and software has overcome those difficulties. However, the result is that the underlying principles governing image processing are often masked in the “user-friendliness” of the equipment.

This course in digital image processing concentrates on the signal processing aspects of imaging science, with the course grade based primarily on hands-on computer projects. The topics to be covered include (a) Digital Image Fundamentals: acquisition, storage, 2-D sequences and systems; (b) Image Enhancement: contrast manipulation, histogram equalization, edge enhancement; (c) Multidimensional Filtering: convolution, design of 2-D digital filters; (d) Multidimensional Transforms: the Fourier and discrete Fourier transforms including the fast Fourier transform (FFT) algorithm and filtering using the FFT; (e) Image Restoration: blur models, inverse filtering; and (f) Image Sample Rate Conversion: interpolation and decimation.

ECE 599 SPECIAL TOPICS: MAGNETOHYDRODYNAMICS (3)

SEC. 010 (Same as AE 531 Section 002)

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: Monday & Thursday 10:45 – 12:00 F252

PROFESSOR: Dr. Trevor Moeller

This course will also address 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. Electromagnetic field theory; chemical kinetics; thermodynamic and thermophysical properties of gas plasmas; governing equations and applications. *Prerequisite(s): 422 and Mathematics 471.*

ECE 600 DOCTORAL RESEARCH AND DISSERTATION (3-15)
SEC. 026
PROFESSOR: Dr. Bruce Bomar

Repeatability: May be repeated.

ECE 692 SPECIAL TOPICS (1-3)
SEC. 002
PROFESSOR: Dr. Bruce Bomar

Advanced topics of current interest to PhD students in electrical engineering. *Repeatability: May be repeated. Maximum 9 hours.*

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 539 CONTINUUM MECHANICS (3)
SEC. 001 (Same as AE 539 & ME 539)
TEXT: TBD
TIME: Tuesday & Friday 1:00 – 2:15 B112
PROFESSOR: Dr. Trevor Moulden

Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics. (*Same as Aerospace Engineering 539; Biomedical Engineering 539; Mechanical Engineering 539*).

ES 541 FLUID DYNAMICS I (3)
SEC. 001 (Same as AE 541 & ME 541)
TEXT: R.L. Panton: Incompressible Flow; Wiley Interscience; 3rd: ISBN# 047126122X
TIME: Tuesday & Friday 9:15 – 10:30 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. (*Same as Aerospace Engineering 541; Mechanical Engineering 541*). *Prerequisite: AE 511 or equivalent, or consent of instructor.*

*ES 551 FINITE ELEMENTS FOR ENGINEERING APPLICATIONS (3) **CANCELLED**
SEC. 009 (Same as AE 571 & ME 561)
TEXT: Class Notes/Handouts
TIME: Tuesday & Friday 1:00 – 2:15 E210
PROFESSOR: Dr. Roy Schulz

Modern computational theory applied to conservation principles across the engineering sciences. Weak forms, extremization, boundary conditions, discrete implementation via finite element, finite difference, finite volume methods. Asymptotic error estimates, accuracy, convergence, stability. Linear problem applications in 1, 2 and 3 dimensions, extensions to non-linearity, non-smooth data, unsteady, spectral analysis techniques, coupled equation systems. Computer projects in heat transfer, structural mechanics, mechanical vibrations, fluid mechanics, heat/mass transport. *(Same as Aerospace Engineering 571; Biomedical Engineering 561; Mechanical Engineering 561)*. *Comment(s): Bachelor's degree in engineering or natural science required.*

ES 552 COMPUTATIONAL FLUID DYNAMICS (3)
 SEC. 001 (Same as AE 572 & 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. *(Same as Aerospace Engineering 572; Mechanical Engineering 562)*.

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

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

*ES 651 ADVANCED TOPICS IN COMPUTATIONAL FLUID DYNAMICS (3) **CANCELLED**
 SEC. 001 (Same as AE 661 & ME 651)
 TEXT: TBD
 TIME: Monday & Thursday 2:30 – 3:45 E210
 PROFESSOR: Dr. Roy Schulz

Modern approximation theory for Euler and Navier-Stokes conservation systems, compressible flow, hyperbolic forms, boundary conditions. Weak forms, extremization, finite element/finite volume/flux vector discrete implementations, a priori error estimates, accuracy, convergence stability. Numerical linear algebra, approximate factorization, sparse matrix methods. Dissipation, Fourier spectral analysis, smooth and non-smooth solutions. *(Same as Aerospace Engineering 661; Mechanical Engineering 651)*. *Prerequisite(s): 552.*

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
SEC. 005 Students located at Tullahoma or Oak Ridge
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 (3)
SEC. 001 UTSI ON Campus Students Use This Number
SEC. 002 UTSI OFF CAMPUS Students Receiving Tapes/CD/Interactive Use this Number
SEC. 005 Students located at Tullahoma or Oak Ridge
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 532 PROUCTIVITY AND QUALITY ENGINEERING (3)
SEC. 001 (Interactive Video)
SEC. 002 UTSI OFF CAMPUS Students Receiving Tapes/CD/Interactive Use this Number
TEXT: Juran's Quality Planning & Analysis for Enterprise Quality (5th Ed.); Frank Gryna, Richard Chua, Joseph DeFeo; McGrawHill, 2007.
TIME: Tuesday 4:00 – 6:35 (CST) E113
PROFESSOR: Dr. Denise Jackson

EM 533 THEORY AND PRACTICE OF ENGINEERING MANAGEMENT (3)
SEC. 001 (Interactive Video)
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 (CST) 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)
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: Thursday 4:00 – 6:35 E113
PROFESSOR: Dr. George Garrison

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.

EM 539 STRATEGIC MANAGEMENT IN TECHNICAL ORGANIZATIONS (3)
SEC. 001 (Interactive Video)
SEC. 002 UTSI OFF CAMPUS Students Receiving Tapes/CD/Interactive Use this Number
TEXT: TBD
TIME: Wednesday 4:00 – 6:35 (CST) E113
PROFESSOR: Dr. Gregory Sedrick

Strategic planning process and strategic management in practice, corporate vision and mission; product, market, organizational, and financial strategies; external factors; commercialization of new analysis to determine commercial feasibility of new ventures. *Prerequisite(s): 553 and Industrial Engineering 518 or consent of instructor.*

INDUSTRIAL ENGINEERING

IE 500 MASTER'S THESIS
SEC. 008 Sedrick
003 Jackson

IE 515 ADVANCED PRODUCTION AND INVENTORY SYSTEMS (3)
SEC. 003 UTSI ON Campus Students CENTRA (Web-based Course from UTK)
SEC. 004
TEXT: TBD
TIME: Monday, Wednesday & Friday 3:35 – 4:25 (EST) Knoxville
PROFESSOR: Dr. Xiaoyan Zhu

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. *Prerequisite: 402 or consent of instructor.*

IE 516 STATISTICAL METHODS IN INDUSTRIAL ENGINEERING (3)
SEC. 003
SEC. 004 UTSI OFF CAMPUS Students Receiving Tapes/CD/Interactive Use this Number
TEXT: Montgomery and Runger; Applied Statistics and Probability for Engineers; Latest Edition; Publisher John Wiley; ISBN# 978-0-471-74589-1.
TIME: Monday 4:00 – 6:35 (CST) E112
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.
Prerequisite: Probability and Statistics for Scientists and Engineers, or equivalent.

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: Tuesday & Thursday 2:10 – 3:25 (EST) Knoxville
PROFESSOR: Dr. Xueping 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*). *Prerequisite(s): 306 or 525.*

IE 591 SPECIAL TOPICS IN INDUSTRIAL ENGINEERING (1-3)
SEC. 006 Jackson

IE 600 DOCTORIAL RESEARCH AND DISSERTATION (3-15)
SEC. 003 Jackson
008 Sedrick

IE 691 ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)
SEC. 003 Sedrick
SEC. 004 Jackson

IE 692 ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)
SEC. 001 Sedrick

IE 693 ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)
SEC. 001 Sedrick

MATERIAL SCIENCE & ENGINEERING

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

MSE 515 PHYSICAL METALLURGY – DIFFUSION AND PHASE TRANSFORMATIONS (3)

SEC. 002
TEXT: TBD

TIME: Monday & Thursday 1:00 – 2:15 E211
PROFESSOR: Drs. William Hofmeister and Charles Johnson

Applications of diffusion to material processing. Diffusion in dilute and concentrated alloys. Thermo- and electro-transport in solids. Grain boundaries and interfaces. Grain boundary diffusion. Recovery, recrystallization, and grain growth. Thermally activated phase transformations. Diffusionless transformations.

*MSE 540 BASIC POLYMER CHEMISTRY (3) **CANCELLED**
SEC. 002

TEXT: TBD
TIME: Tuesday & Friday 9:15 – 10:30 F253
PROFESSOR: Dr. Zhongren Yue

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

COMMENTS: Introductory concepts and definitions of polymers. Polymer solution properties, conformation and molecular weight characterization. Fundamentals of polymer science and engineering. The structure and characterization of polymers. Rheological and viscoelastic behavior: relaxations and transitions, rubber elasticity. Crystallinity, morphology and deformation of crystalline polymers. Compounding and processing of plastics. Description of major structure, properties and utilization of polymers and polymer materials - plastics, fibers, rubbers, composites, etc.

***MSE 552 BASIC POLYMER CHEMISTRY (3) CANCELLED**

SEC. 002

TEXT: TBD and class notes

TIME: Monday & Thursday 1:00 – 2:15 F253

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. Matrix for composites- polymers, (thermosetting, high temperature and thermoplastic), metal, and ceramic. Fabrication of fiber reinforced composite materials.

MSE 576 SPECIAL TOPICS IN MATERIALS SCIENCE AND ENGINEERING (3)

SEC. 003

TEXT: TBD

TIME: Tuesday & Friday 2:30 – 3:45 F252

PROFESSOR: Drs. Jackie Johnson and George Murray

Thin films and surface analysis.

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 2:30 - 3:45 B210

PROFESSOR: Dr. Kenneth Kimble

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. 003
TEXT: G. Strang: Linear Algebra and It's Applications; 4th Ed.; Brooks and Cole;
ISBN-10 0030105676; ISBN-13 978-0030105678.
TIME: Tuesday & Friday 2:30 – 3:45 E211
PROFESSOR: Dr. Trevor Moulden

Advanced topics in matrix theory including Jordan canonical form. *Prerequisite(s) 251 or 257*

MATH 471 NUMERICAL ANALYSIS (3)
SEC. 001 (Video Recorded)
TEXT: TBD
TIME: Monday & Wednesday 2:30 – 3:45 E112
PROFESSOR: Dr. Trevor Moulden

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. *Prerequisite: 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 B112
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. *Prerequisite: MATH 432. This course is a prerequisite for ES 539.*

MATH 500 MASTER'S THESIS (3, 6, or 9)
SEC. 001 PROFESSOR: Dr. Boris Kupershmidt

MATH 513 MATHEMATICAL PRINCIPLES OF FLUID MECHANICS I (3)
SEC. 003
TEXT: TBD
TIME: Tuesday & Thursday 10:10 – 11:25(CST) TBD
PROFESSOR: Dr. Gary Flandro

Equations of motion, incompressible and compressible potential flow, shock waves, viscous flows. Navier-Stokes equations.

MATH 519 SEMINAR IN APPLIED MATHEMATICS (1-3)
SEC. 002
TEXT: Notes provided by Instructor
TIME: Monday & Thursday 8:45 – 10:00 E112
PROFESSOR: Dr. Boris Kupershmidt

Repeatability: May be repeated. Maximum 12 hours.

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 (Interactive Video)

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

TIME: Tuesday & Friday 1:00 – 2:15 E113
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 515 NUMERICAL HEAT AND MASS TRANSFER (3) **CANCELLED**

SEC. 002

TEXT: TBD

TIME: Monday & Thursday 1:00 – 2:15 E210
PROFESSOR: Dr. Roy Schulz

Discrete modeling of Navier-Stokes equations and energy equation via control volume methods. Difference methods for discretization of convective term, iterative solution algorithms for pressure-linked equations modeling forced and buoyancy driven flows. Computer project. *Recommended Background: Undergraduate fluid mechanics and heat transfer course.*

ME 521 THERMODYNAMICS I (3)
SEC. 001

TEXT: Thermodynamics, and Engineering Approach; Y. Cengel and M. Boles;
Half.com_Books_Thermodynamics_An Engineering Approach.webarchive;
Amazon.com_Thermodynamics_An Engineering Approach w_version 1.2 CD
ROM_Yunus A. Cengel, Michael Boles_Books.webarchive.

TIME: Monday & Thursday 4:30 – 5:45 E211
PROFESSOR: Dr. Roy Schulz

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: Monday & Thursday 7:45 – 9:00 E210
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. *Prerequisite(s): 522 and 541 or consent of instructor.*

ME 533 DYNAMICS (3)
SEC. 007
TEXT: Goldstein, H.; Classical Mechanics; 3rd Ed.; McMillan.
TIME: Tuesday & Friday 7:45 – 9:00 E210
PROFESSOR: Dr. Gary Flandro

Kinematics and dynamics of particles in three dimensions. Rotating coordinate systems. Hamilton's principle. Lagrange's equations of motion. Kinematics and dynamics of rigid bodies. *(Same as Aerospace Engineering 533: Engineering Science 533.) (DE) Prerequisite(s): 391 or Mathematics 431 and an undergraduate vibrations course.*

ME 539 CONTINUUM MECHANICS (3)
SEC. 001 (Same as AE 539 & ES 539)
TEXT: TBD
TIME: Tuesday & Friday 1:00 – 2:15 B112
PROFESSOR: Dr. Trevor Moulden

Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics. *(Same as Aerospace Engineering 539; Biomedical Engineering 539; Engineering Science 539).*

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 9:15 – 10:30 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. *(Same as Aerospace Engineering 541; Engineering Science 541). Prerequisite: AE 511 or equivalent, or consent of instructor.*

*ME 561 FINITE ELEMENTS FOR ENGINEERING APPLICATIONS (3) **CANCELLED**
SEC. 009 (Same as AE 571 & ES 551)
TEXT: Class Notes/Handouts
TIME: Tuesday & Friday 1:00 – 2:15 E210
PROFESSOR: Dr. Roy Schulz

Modern computational theory applied to conservation principles across the engineering sciences. Weak forms, extremization, boundary conditions, discrete implementation via finite element,

finite difference, finite volume methods. Asymptotic error estimates, accuracy, convergence, stability. Linear problem applications in 1, 2 and 3 dimensions, extensions to non-linearity, non-smooth data, unsteady, spectral analysis techniques, coupled equation systems. Computer projects in heat transfer, structural mechanics, mechanical vibrations, fluid mechanics, heat/mass transport. (*Same as Aerospace Engineering 571; Biomedical Engineering 561; Engineering Science 551*). *Comment(s): Bachelor's degree in engineering or natural science required.*

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. (*Same as Aerospace Engineering 572; Engineering Science 552*).

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 (Videotaped)
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 (3) **CANCELLED**
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: Tuesday & Friday 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 600 DOCTORAL AND RESEARCH DISSERTATION (3 - 15)
SEC. 014 Schulz
015 Vakili
016 Majdalani
017 Steinhoff
018 Flandro
019 Antar
29 Desmidt

*ME 610 ADVANCED TOPICS IN THERMAL/FLUID SCIENCE: ADVANCED **CANCELLED**
THEORY AND APPLICATIONS IN THE THERMAL/FLUID SCIENCES (3)

SEC. 003

TEXT: Vectors, Tensors and the Basic Equations of Fluid Mechanics; Rutherford Aris, Dover Publishing; ISBN # 978-0486661100.
Tensors, Differential Forms and Variational Principles; David Lovelock & Hanno Rund; Dover Publishing; ISBN # 978-0486658407.
Instructors Course Notes

TIME: Monday & Thursday 2:30 – 3:45 E211
PROFESSOR: Dr. Thad Morton

This course will cover modern mathematical methods in fluid mechanics, including methods from tensor analysis and differential geometry for obtaining useful descriptions of material in motion, particularly for vortex flows. The course will include the study of transformations to streamline coordinates and other general coordinate systems. The Navier-Stokes and vorticity equations will be studied in terms of general coordinate systems.

*ME 613 ADVANCED RADIATION HEAT TRANSFER (3) **CANCELLED**
 SEC. 002
 TEXT: TBD
 TIME: Tuesday & Friday 2:30 – 3:45 E210
 PROFESSOR: Dr. Roy Schulz

Radiation heat transfer in absorbing, emitting and scattering media; interaction of thermal radiation with conduction and convection heat transfer. *Prerequisite(s): 511 and 512.*

*ME 651 ADVANCED TOPICS IN COMPUTATIONAL FLUID DYNAMICS (3) **CANCELLED**
 SEC. 001 (Same as AE 661 & ES 651)
 TEXT: TBD
 TIME: Monday & Thursday 9:15 – 10:30 E210
 PROFESSOR: Dr. Roy Schulz

Modern approximation theory for Euler and Navier-Stokes conservation systems, compressible flow, hyperbolic forms, boundary conditions. Weak forms, extremization, finite element/finite volume/flux vector discrete implementations, a priori error estimates, accuracy, convergence stability. Numerical linear algebra, approximate factorization, sparse matrix methods. Dissipation, Fourier spectral analysis, smooth and non-smooth solutions. *(Same as Aerospace Engineering 661; Engineering Science 651). Prerequisite(s): 552.*

PHYSICS

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

PHYS 501 GRADUATE RESEARCH PARTICIPATION (3)
 SEC. 003
 TEXT: TBD
 TIME: Tuesday & Friday 10:45– 12:00 F252
 PROFESSOR: Dr. Ann Chen

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

PHYS 503 PHYSICS COLLOQUIUM (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. Christian Parigger

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

PHYS 513 PROBLEMS IN THEORETICAL PHYSICS I (3)
SEC. 002 (Interactive from UTK, Distance Ed)
TEXT: Check with Instructor
TIME: Wednesday 10:00 – 11:30 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 (Video Recorded)
TEXT: Sakurai: Modern Quantum Mechanics; Addison Wesley
TIME: Monday & Thursday 8:45 – 9:45 E113
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. *Prerequisite(s): 531, 571.*

PHYS 531 CLASSICAL MECHANICS (3)
SEC. 002
TEXT: Goldstein: Classical Mechanics; Addison Wesley
TIME: Monday & Thursday 2:30 – 3:45 F252
PROFESSOR: Dr. Christian Parigger

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

*PHYS 555 SOLID STATE PHYSICS (3) **CANCELLED**
SEC. 001 (Same as ME 599)

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.cmp.ucl.ac.uk/~aph/Teaching/3C25/index.html> and specifically the e-book <http://www.cmp.ucl.ac.uk/~aph/Teaching/3C25/notes.pdf> and additional electronic notes <http://www.cmp.ucl.ac.uk/~aph/Teaching/3C25/HighTc.pdf> and <http://www.cmp.ucl.ac.uk/~aph/Teaching/3C25/HTSCnotes.pdf>
TIME: Tuesday & Friday 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 593 INDEPENDENT STUDY (1)
SEC. 002
TEXT: Paras N. Prasad; Nanophotonics; ISBN# 0-471-64988-0
TIME: Wednesday 7:30 – 8:45 CLA
PROFESSOR: Dr. Lloyd Davis

Topics in Classical Physics.

PHYS 599 SEMINARS (1-3)
SEC. 007
TEXT: TBD
TIME: Monday & Thursday 9:15 – 10:30 F253
PROFESSOR: Dr. Lloyd Davis

(a) Mechanics; (b) Radiation; (c) Heat and Thermodynamics; (d) Electricity and Magnetism; (e) Modern Physics. *Repeatability: may be repeated with consent of department. Maximum 18 hours.*

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

*PHYS 627 ELEMENTARY PARTICLE PHYSICS (3) **CANCELLED**
SEC. 001
TEXT: TBD
TIME: Monday & Thursday 1:00 – 2:15 B210
PROFESSOR: Dr. Horace Crater

Advanced topics – quark models, electroweak interactions, and unification of elementary forces. **(Comment(s): Intended for students specializing in the field).**

PHYS 642 ADVANCED TOPICS IN MODERN PHYSICS (3)
SEC. 004
TIME: Monday and Thursday 1:00 – 2:15 B210
TEXT: TBD
PROFESSOR: Dr. Horace Crater

Advanced theoretical or experimental topics not covered in other courses. May be repeated with consent of department. Maximum 9 hrs.

PHYS 643 COMPUTATIONAL PHYSICS (3)
SEC. 001
TIME: Wednesday 4:00 – 6:00 (CST) E112 (UTSI)
5:00 – 7:00 (EST) South College Room 105 (UTK)
TEXT: TBD
PROFESSOR: Dr. Christian Parigger

Developing computer algorithms for solving representative problems in various fields of physics, celestial dynamics in astrophysics, boundary value problems in electromagnetism, atomic and nuclear structures, band structure in solid state physics, transport problems in statistical mechanics, Monte Carlo simulation of liquids, fitting and interpolation of data, correlation analysis, or optimization strategy. *Prerequisite(s): 521, 531 and 571.*

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