

Summer 2010



THE UNIVERSITY of TENNESSEE 
SPACE INSTITUTE

411 B.H. Goethert Parkway
Tullahoma, TN 37388-9700
888-822-8874 x-37228
www.utsi.edu

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

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**CALENDAR
SUMMER SEMESTER 2010**

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

FALL SEMESTER 2010

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

SUMMER SEMESTER 2010

FINAL STUDY DAY AND EXAM SCHEDULE

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

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

Monday, Thursday and Tuesday, Friday

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

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

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

**REGISTRATION ANNOUNCEMENT
SUMMER SEMESTER 2010**

REGISTRATION PROCEDURE

ADVISING

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

REGISTRATION

UTSI students **MUST** register on the web at Circle Park Online. The registration system will be available Monday through Saturday, 6:00 AM - 11:00 PM (CST) and Sundays 12:00 PM - 5:00 PM (CST). Registration will be March 1, 2010 – May 25, 2010. Late registration will be May 26, 2010 – June 11, 2010. Classes begin June 3, 2010.

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

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

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

CPO Technical Support: Send email including your return email address in the text of your message to cpo@utk.edu

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

Days of the Week

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

FINANCIAL CALENDAR

Last Registration Day for Receiving Statements by Mail	May 15, 2010
Statement Information Available in Bursar Areas or at CPO.UTK.EDU	May 17, 2010
Priority Registration Payment/Confirmation Deadline (3:30 pm CDT)	May 25, 2010
Late Registration/Late Fees Begin	May 26, 2010
Late Registration Payment/Confirmation Deadline (3:30 pm CDT)	June 11, 2010

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. 37297 or by email jboyles@utsi.edu

TOLL-FREE NUMBER

For a specific office:	1-888-822-UTSI (8874) and the extension number.
For general information:	1-888-822-UTSI (8874)
Admissions Office:	1-888-822-UTSI (8874)-37293
Bookstore:	1-888-822-UTSI (8874)-37204
Business Office:	1-888-822-UTSI (8874)-37204
Registrar's Office:	1-888-822-UTSI (8874)-37228

BOOKSTORE HOURS

The Bookstore is located in Lower C-Wing Business Office. The Bookstore hours are 8:00 a.m. - 4:00 p.m. All textbooks will be returned to the publisher one week after midterm. For further information concerning books contact the Bookstore, ext. 37204 or 37314 or by email Robin Nee at rne@utsi.edu; or Vicki Carr at vcarr@utsi.edu

APPLICATION FOR ADMISSION

No student will be allowed to register unless a completed Application for Admission to the Graduate School of the University of Tennessee, Knoxville (UTK) is on file in the Registrar's Office. An Application for Admission to the UTK Graduate School must be accompanied by a \$35.00 non-refundable application fee, payable to The University of Tennessee Space Institute. Applicants are required to provide one official transcript of all undergraduate and graduate records. Students may apply on-line at <http://admissions.utk.edu/graduate/apply.shtml> [click on APPLY ONLINE and Follow Directions]. Students may send Application for Admission, transcripts, GRE scores (if required); and if international application, TOEFL scores to the Admissions Office, E-109, Mail Stop 19, UTSI, Tullahoma, TN 37388-9700.

PAYMENT OF FEES

Payment of fees is due at time of registration. Late fees will begin on May 26, 2010. The University of Tennessee Space Institute accepts Visa, MasterCard and Discover.

FEES OF DISTANCE STUDENTS

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

Aviation Systems	Stephen Corda	931-393-7413	scorda@utsi.edu
Engineering Mgt.	Dee Merriman	931-393-7293	dmerrima@utsi.edu

TUITION AND/OR MAINTENANCE FEES*

Full Fees For In-State Students (per semester)

Maintenance Fee	\$3,413.00 *
Programs and Services Fee	75.00
Total	\$3,488.00

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

Maintenance Fee	\$3,413.00*
Programs and Services Fee	75.00
Tuition	6,898.00
Total	\$10,386.00

***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 3 hrs.	\$380.00 per semester hour \$1,140.00
OUT-OF-STATE 3 hrs.	\$1,147.00 per semester hour \$3,441.00

PROGRAMS AND SERVICES FEE

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

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

RETURNED CHECK POLICY

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

DEFERRED PAYMENT PLAN

Although fees, rent and other University expenses are due and payable at the beginning of each term, a full-time student in good financial standing with a definite anticipated source of funds may request the deferment of up to 50% of the total charges at registration. The deferred payment may be divided into two equal payments with the second payment due on the 45th (July 14, 2010) day of the semester. All financial aid monies must be applied to fees before a deferment will be considered. A deferred payment service fee of \$20.00 is assessed when any portion of tuition, fees, and other charges are deferred with the approval of the Business Office. An additional \$35.00 late payment charge will be assessed if the second installment is not paid on or before the due date. For more details, contact the Business Office.

LATE PAYMENT FEES

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

TUITION/FEE POLICY FOR DROPPED COURSES OR WITHDRAWAL

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

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

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

DROP DATE	CHARGE	REFUND
June 3 – June 7	NO CHARGE	100%
July 8 – June 13	20% CHARGE	80%
June 14 – June 18	40% CHARGE	60%
June 19 – June 23	60% CHARGE	40%
June 24 - End of Term	100% CHARGE	NO REFUND

TUITION/FEE REFUND POLICY FOR WITHDRAWALS

Withdrawal from school for the term after registration has been processed, even though classes have not been attended or fees paid, must be by official notification to the Registrar's office. The effective date of withdrawal is the date the Registrar's office is notified by completion of the Change of Registration request form. **FAILURE TO ATTEND CLASS DOES NOT AUTOMATICALLY CANCEL ENROLLMENT.** The appropriate percentage of fees will be charged unless the Registrar's Office is notified by the close of the last day designated for registration and before the first official day of classes for the semester or term. **WITHDRAWAL DOES NOT CANCEL FEES AND CHARGES ALREADY INCURRED. THE DROP/ADD PROCEDURE CAN NOT BE USED TO WITHDRAW FROM SCHOOL FOR THE SEMESTER OR TERM.** When a course is canceled by UTSI administration, the students who have registered for the course will be notified by either the instructor and/or the Registrar's Office and required to file a Change of Registration form with the Registrar's Office, UTSI, Room D-100, 393-7228.

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

REFUNDS

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

REPAYMENTS

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

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

WITHDRAWAL (TOTAL) FROM THE UNIVERSITY

If, after registering for classes and either returning your fee payment or your Confirmation of Attendance form to the Bursar's Office, you decide not to enroll for this term, you must immediately notify the Registrar's Office at UTSI. If you withdraw officially on or before a Change of Registration deadline, but after the no "W" deadline for a particular session, the grade of "W" will be issued.

GRADES

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

GRADUATE STUDENTS CHANGE OF REGISTRATION AFTER THE DEADLINE

To change registration in any way after the deadline, a graduate student must present a request, signed by the instructor(s) and adviser as evidence of their knowledge of the request to the Registrar's Office at UTSI. Graduate students must verify that ALL changes have been approved by their academic adviser. If the Office of Graduate Student Services approves the change of registration, the change will be noted on the student's permanent record. **THE DROP DEADLINE FOR GRADES AND THE DROP DEADLINES FOR FEE REFUNDS ARE NOT THE SAME.**

FULL-TIME STUDENTS

Students enrolled in at least 9 semester hours during the Fall/Spring semesters or 6 hours in the Summer Term are considered full-time students. Research Assistants must be full-time students and also enroll in one of the MAES 595 seminars or a PHYS 503 seminar each term, unless a waiver is granted by the Dean for Academic Affairs.

REMOVAL OF INCOMPLETE GRADES

All Incomplete Grades (I) must be removed within one semester, excluding the Summer Term. If a supplementary grade report has not been received in the Registrar's Office at the end of the following semester, the I will be changed to an E. The course will not be counted in the cumulative grade point average until a final grade is assigned. Students wishing to graduate Summer Semester 2010 must remove all INCOMPLETE GRADES by August 10, 2010.

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

REPEATING A COURSE

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

ADMISSION TO CANDIDACY

MASTER OF SCIENCE DEGREE:

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

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

ADMISSION TO CANDIDACY

DOCTOR OF PHILOSOPHY DEGREE:

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

CONTINUOUS REGISTRATION OF DOCTORAL STUDENTS

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

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

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

apply for re-examination until the following semester. The result of the second examination is final.

UT POLICY ON INSURANCE FOR INTERNATIONAL STUDENTS

All foreign national students registered with the University of Tennessee, Knoxville, are required to have comprehensive medical insurance. The policy for the 2010 academic year is provided by United Healthcare. The premium must be paid before registration. Contact the Human Resources Department (C-104, ext. 37267) for further information.

GENERAL SEMINAR

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

FINAL EXAM DATES FOR SUMMER SEMESTER 2010

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

HONOR STATEMENT

The following Honor Statement is signed by all students applying to The Graduate School:

"An essential feature of The University of Tennessee, Knoxville is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity."

For official information on all UTK Graduate School policies, refer to the current UTK Graduate Catalog available in the Registrar's Office, D-100.

The University of Tennessee Space Institute reserves the right to cancel any class with an insufficient number of students, or for other reasons.

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

**THE UNIVERSITY OF TENNESSEE
SPACE INSTITUTE
SUMMER 2010 SEMESTER COURSE LISTINGS**

AEROSPACE ENGINEERING

AE 422 AERODYNAMICS (3)

SEC. 002 (Video Recorded)

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

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

PROFESSOR: Dr. Peter Solies

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

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

SEC. 003 Antar

004 Flandro

005 Majdalani

006 Steinhoff

012 Corda

013 Moeller

015 Vakili

016 Schulz

017 Solies

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

SEC. 001 Antar

SEC. 003 Corda

AE 513 EXPERIMENTAL METHODS IN FLUID MECHANICS (3)

SEC. 001

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

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

PROFESSOR: Dr. Ahmad Vakili

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

AE 532 INTRODUCTION TO TURBULENCE (3)

SEC. 001 (Same as ME 599 Sec. 001)

TIME: Tuesday & Friday 9:30 – 11:30 E211

TEXT: H. Tennekes and J.L. Lumley; A First Course in Turbulence; MIT Press;
Latest Ed.; ISBN# 0262200198
PROFESSOR: Dr. Basil Antar

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

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

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

AE 590 SELECTED ENGINEERING PROBLEMS (2-6)

SEC. 001 PROFESSOR: Dr. Ahmad Vakili

SEC. 002 PROFESSOR: Dr. Milton Davis

SEC. 003 PROFESSOR: Dr. Monty Smith

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

SEC. 003 Antar

004 Flandro

005 Majdalani

006 Steinhoff

014 Vakili

015 Moeller

AE 690 ADVANCED TOPICS IN AEROSPACE ENGINEERING: (3)

SEC. 001

TIME: TBD

TEXT: TBD

PROFESSOR: Dr. Stephen Corda

Repeatability: May be repeated. Maximun 9 hours. Registration Permission: Consent of Instructor

AVIATION SYSTEMS

AS 500 MASTER'S THESIS (1 - 15)

SEC. 001 Corda

002 Collins

003 Martos

004 Muratore

005 Pujol

006 Solies

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

SEC. 001 Corda

002 Collins

003 Martos

004 Muratore

005 Pujol
006 Solies

AS 507 INTRODUCTION TO AIRBORNE RADAR (3)

SEC. 001 (Video Recorded)

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

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

PROFESSOR: Dr. Alfonso Pujol

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

AS 510 FLIGHT TEST DATA PROCESSING (3)

SEC. 001 (Video Recorded)

TEXT: Class Notes

TIME: Monday & Thursday 10:15 – 12:00 E113

PROFESSOR: John Muratore

This course will introduce the student to the typical data processing techniques and issues unique to a flight test. The course will discuss the unique nature of flight test data sources (telemetry, recordings, military and commercial databus formats, audio and video formats) and unique processing algorithms to deal with these formats. The course will discuss data compression and processing algorithms typically used in real time as well as postflight data reduction. The course will discuss techniques for reducing noise in flight test data such as digital filtering and wildpoint elimination, techniques for performing statistical analysis of flight data such as regression analysis and techniques for analyzing flight test data in the time and frequency domain (fourier and spectral analysis). The course will discuss the problems associated with planning for flight test data reduction including problems in managing databases and building data simulators for flight test data processing operations and validation. Special topics such as data archiving and flight visualization will also be discussed. The course will make extensive use of LabVIEW and MATLAB and the students will be expected to program and test algorithms in these languages. Excel will also be used.

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

***AS 510 SPECIAL TOPICS: ATMOSPHERIC SCIENCE (3) CANCELLED**

SEC. 002 (Video Recorded)

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

TIME: Tuesday & Friday 1:00 – 3:00 E113

PROFESSOR: Dr. Basil Antar

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

1. A brief Survey of the Atmosphere
2. The Earth System: The hydrologic cycle; The Carbon cycle; Oxygen in the Earth system and; History of Climate.

3. Atmospheric Thermodynamics
4. Radiative Transfer
5. Atmospheric Chemistry
6. Cloud Microphysics
7. Atmospheric Dynamics

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

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

BIOMEDICAL ENGINEERING

BE 529 APPLICATIONS OF LINEAR ALGEBRA IN ENGINEERING SYSTEMS (3)
 SEC. 001 (Same as CBE/ECE/IE/MSE/ME 529)
 TEXT: Advanced Linear Algebra for Engineers with MATLAB; Sohail A. Dianat and Eli S. Saber; CRC Press; Latest Edition; ISBN # 978-1-4200-9523-4
 TIME: Pre-Recorded Video Lectures, Exam Periods TBA
 PROFESSOR: Dr. Montgomery Smith

Methods of linear algebra as applied to engineering. Topics to be covered include: systems of linear equations, matrices, solutions of linear equations, Gaussian elimination, vector spaces, linear transformations, orthogonality, least-squares approximations, determinants, eigenvalues and eigenvectors, positive definite matrices, singular value decomposition, and numerical computational methods. Course assignments will consist of pencil-and-paper exercises and numerical exercises involving MATLAB. Students registering for this course are expected to have access to at least The Student Edition of MATLAB.

*BE 587 DYNAMIC MODELING AND SIMULATION (3) **CANCELLED**
 SEC. 001 (Interactive Video) (Same as ME 587).
 TEXT: An Introduction to Mathematical Modeling; Edward A. Bender; Dover Publications; ISBN# 0-486-41180-X
 TIME: Wednesday & Friday 1:00 – 3:00 E111
 PROFESSOR: Dr. Kenneth Kimble

Modeling and analysis of physical systems. Systems and parameter identification. Mathematical modeling methods and approximations. Digital simulation techniques and practices. Design and control applications.

CHEMICAL/BIOMEDICAL ENGINEERING

CBE 529 APPLICATIONS OF LINEAR ALGEBRA IN ENGINEERING SYSTEMS (3)

SEC. 001 (Same as BE/ECE/IE/MSE/ME 529)
 TEXT: Advanced Linear Algebra for Engineers with MATLAB; Sohail A. Dianat and Eli S. Saber; CRC Press; Latest Edition; ISBN # 978-1-4200-9523-4
 TIME: Pre-Recorded Video Lectures, Exam Periods TBA
 PROFESSOR: Dr. Montgomery Smith

Methods of linear algebra as applied to engineering. Topics to be covered include: systems of linear equations, matrices, solutions of linear equations, Gaussian elimination, vector spaces, linear transformations, orthogonality, least-squares approximations, determinants, eigenvalues and eigenvectors, positive definite matrices, singular value decomposition, and numerical computational methods. Course assignments will consist of pencil-and-paper exercises and numerical exercises involving MATLAB. Students registering for this course are expected to have access to at least The Student Edition of MATLAB.

COMPUTER SCIENCE

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

CS 572 NUMERICAL MATHEMATICS II (3)
 SEC. 004 (Interactive Video) (Same as Math 572)
 TEXT: Texts in Applied Mathematics 37; Alfio Quarteroni et al; Springer; 2nd edition 2006; ISBN# 0939-2475.
 Other References include: Survey of Computational Physics; Rubin Landau et al; Princeton 2008; ISBN# 978-0-691-13137-5. Numerical Recipes; William Press et al; 3rd Edition (2007); ISBN-10: 0521880688; Example codes including references to computer languages such as FORTRAN, C, C++, Java, and/or implementations of software packages/libraries. For example, "Numerical Analysis", Rainer Kress, Graduate Texts in Mathematics 181, Springer (1998), ISBN# 0-387-98408-9, or Erich Schmid et al; Theoretical Physics on the Personal Computer; 2nd Edition; Springer (1987), ISBN# 0-387-52243-3. Numerical Mathematics II will also include references to Zwillinger's Handbook on Differential Equations; 3rd Edition; Academic Press (1997); ISBN# 0-12-784396-5.
 TIME: Monday & Wednesday 10:00 – 12:00 E211
 PROFESSOR: Dr. Christian Parigger

This course is part II of a two-part course series, recommended to be taken in sequence. The first part, "Numerical Mathematics I" was offered in Summer 2009. However, please contact the instructor for detailed information on Numerical Mathematics I. UT's electronic "blackboard" will be used for this course. This course qualifies as a Mathematics portion for students seeking the so-called "Interdisciplinary Graduate Minor in Computer Science."

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

ELECTRICAL and COMPUTER ENGINEERING

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

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

ECE 502 REGISTRATION FOR USE OF FACILITIES
 SEC. 002 Bomar
 003 Smith
 004 Pujol
 005 Whitehead

ECE 529 APPLICATIONS OF LINEAR ALGEBRA IN ENGINEERING SYSTEMS (3)
 SEC. 001 (Same as BE/CBE/IE/MSE/ME 529)
 TEXT: Advanced Linear Algebra for Engineers with MATLAB; Sohail A. Dianat and Eli S. Saber; CRC Press; Latest Edition; ISBN # 978-1-4200-9523-4
 TIME: Pre-Recorded Video Lectures, Exam Periods TBA
 PROFESSOR: Dr. Montgomery Smith

Methods of linear algebra as applied to engineering. Topics to be covered include: systems of linear equations, matrices, solutions of linear equations, Gaussian elimination, vector spaces, linear transformations, orthogonality, least-squares approximations, determinants, eigenvalues and eigenvectors, positive definite matrices, singular value decomposition, and numerical computational methods. Course assignments will consist of pencil-and-paper exercises and numerical exercises involving MATLAB. Students registering for this course are expected to have access to at least The Student Edition of MATLAB.

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

ENGINEERING SCIENCE

ES 500 MASTER'S THESIS (3, 6, or 9)
 SEC. 001 Schulz
 003 Flandro
 004 Majdalani
 005 Steinhoff
 006 Vakili
 014 Antar

ES 502 Use of Facilities
 SEC. 002 Dr. Ahmad Vakili

ES 600 DOCTORAL AND RESEARCH DISSERTATION (3, 6, 9)
 SEC. 004 Majdalani
 005 Steinhoff
 006 Vakili
 011 Antar
 014 Moeller

ENGINEERING MANAGEMENT:

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

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

EM 502 REGISTRATION FOR USE OF FACILITIES for EM STUDENTS (1-15)
SEC. 001 Dr. Gregory Sedrick
SEC. 002 Dr. Denise Jackson

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

EM 536 PROJECT MANAGEMENT (3)
SEC. 001 UTSI Students participating at Tullahoma or Oak Ridge
SEC. 002 UTSI Students participating elsewhere
SEC. 003 UTK Students participating at Knoxville DE Classrooms
SEC. 004 UTK Students participating elsewhere
TEXT: http://www.utsi.edu/academics/ieandem/student_services.htm
TIME: Tuesday & Thursday 4:00 – 6:35 E113
PROFESSOR: Dr. Denise Jackson

Development and management of engineering and technology projects. Project proposal preparation; resource and cost estimating; and project planning, organizing and controlling; network diagrams and other techniques. Role of project manager: team building, conflict resolution, and contract negotiations. Discussion of typical problems and alternative solutions. Case studies and student projects. *(DE) Prerequisite(s): 537 or consent of instructor.*

EM 542 DESIGN OF EXPERIMENTS FOR ENGINEERING MANAGERS (3)
SEC. 001 UTSI Students Participating at Tullahoma or Oak Ridge
SEC. 002 UTSI Students Participating elsewhere
SEC. 003 UTK Students participating at Knoxville DE Classrooms
SEC. 004 UTK Students participating elsewhere
TEXT: http://www.utsi.edu/academics/ieandem/student_services.htm
TIME: Monday & Wednesday 4:00 – 6:35 E113
PROFESSOR: Dr. Alberto Garcia

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

EM 543 LEGAL AND ETHICAL ASPECTS OF ENGINEERING MANAGEMENT (3)
SEC. 001 UTSI Students Participating at Tullahoma or Oak Ridge
SEC. 002 UTSI Students Participating elsewhere
SEC. 003 UTK Students participating at Knoxville DE Classrooms

SEC. 004 UTK Students participating elsewhere
TEXT: http://www.utsi.edu/academics/ieandem/student_services.htm
TIME: Monday & Wednesday 4:30 – 7:00 E111
PROFESSOR: Dr. Frank W. Steinle, Jr.

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

EM 600 DOCTORAL & RESEARCH DISSERTATION (3-15)
SEC. 001 Sedrick

INDUSTRIAL ENGINEERING

IE 500 MASTER'S THESIS (1-15)
SEC. 005 Dr. Gregory Sedrick
SEC. 008 Dr. Denise Jackson

IE 529 APPLICATIONS OF LINEAR ALGEBRA IN ENGINEERING SYSTEMS (3)
SEC. 001 (Same as BE/CBE/ECE/MSE/ME 529)
TEXT: Advanced Linear Algebra for Engineers with MATLAB; Sohail A. Dianat and Eli S. Saber; CRC Press; Latest Edition; ISBN # 978-1-4200-9523-4
TIME: Pre-Recorded Video Lectures, Exam Periods TBA
PROFESSOR: Dr. Montgomery Smith

Methods of linear algebra as applied to engineering. Topics to be covered include: systems of linear equations, matrices, solutions of linear equations, Gaussian elimination, vector spaces, linear transformations, orthogonality, least-squares approximations, determinants, eigenvalues and eigenvectors, positive definite matrices, singular value decomposition, and numerical computational methods. Course assignments will consist of pencil-and-paper exercises and numerical exercises involving MATLAB. Students registering for this course are expected to have access to at least The Student Edition of MATLAB.

IE 600 DOCTORAL & RESEARCH DISSERTATION (3-15)
SEC. 002 Jackson
SEC. 008 Sedrick

MATERIALS SCIENCE & ENGINEERING

MSE 500 MASTER'S THESIS (3, 6 or 9)
SEC. 002 Hofmeister
SEC. 003 Murray
SEC. 004 Johnson

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

MSE 529 APPLICATIONS OF LINEAR ALGEBRA IN ENGINEERING SYSTEMS (3)

SEC. 001 (Same as BE/CBE/ECE/IE/ME 529)
 TEXT: Advanced Linear Algebra for Engineers with MATLAB; Sohail A. Dianat and Eli S. Saber; CRC Press; Latest Edition; ISBN # 978-1-4200-9523-4
 TIME: Pre-Recorded Video Lectures, Exam Periods TBA
 PROFESSOR: Dr. Montgomery Smith

Methods of linear algebra as applied to engineering. Topics to be covered include: systems of linear equations, matrices, solutions of linear equations, Gaussian elimination, vector spaces, linear transformations, orthogonality, least-squares approximations, determinants, eigenvalues and eigenvectors, positive definite matrices, singular value decomposition, and numerical computational methods. Course assignments will consist of pencil-and-paper exercises and numerical exercises involving MATLAB. Students registering for this course are expected to have access to at least The Student Edition of MATLAB.

MATHEMATICS

MATH 443 COMPLEX VARIABLES (3)
 SEC. 001 (Video Recorded)
 TEXT: M. Spiegel: Complex Variables Schaum's Outline; Mc-Graw Hill; 29th Ed; ISBN# 07-060230-1
 TIME: Monday & Thursday 1:00 – 3:00 E113
 PROFESSOR: Dr. Horace Crater

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

MATH 500 MASTER'S THESIS (3, 6, 9)
 SEC. 001 Reddy

MATH 572 NUMERICAL MATHEMATICS II (3)
 SEC. 004 (Interactive Video) (Same as CS 572)
 TEXT: Texts in Applied Mathematics 37; Alfio Quarteroni et al; Springer; 2nd edition 2006; ISBN# 0939-2475.
 Other References include: Survey of Computational Physics; Rubin Landau et al; Princeton 2008; ISBN# 978-0-691-13137-5. Numerical Recipes; William Press et al; 3rd Edition (2007); ISBN-10: 0521880688; Example codes including references to computer languages such as FORTRAN, C, C++, Java, and/or implementations of software packages/libraries. For example, "Numerical Analysis", Rainer Kress, Graduate Texts in Mathematics 181, Springer (1998), ISBN# 0-387-98408-9, or Erich Schmid et al; Theoretical Physics on the Personal Computer; 2nd Edition; Springer (1987), ISBN# 0-387-52243-3. Numerical Mathematics II will also include references to Zwillinger's Handbook on Differential Equations; 3rd Edition; Academic Press (1997); ISBN# 0-12-784396-5.
 TIME: Monday & Wednesday 10:00 – 12:00 E211
 PROFESSOR: Dr. Christian Parigger

This course is part II of a two-part course series, recommended to be taken in sequence. The first part, "Numerical Mathematics I" was offered in Summer 2009. However, please contact the instructor for detailed information on Numerical Mathematics I. UT's electronic "blackboard" will be used for this course. This course qualifies as a Mathematics portion for students seeking the so-called "Interdisciplinary Graduate Minor in Computer Science."

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

MATH 598 GRADUATE READING IN MATHEMATICS (1-3)
SEC. 002 Dr. K.C. Reddy

Independent study with faculty guidance. *Repeatability: May be repeated. Maximum 6 hours.*
Comments: Graduate standing required. Registration Permission: consent of instructor.

MECHANICAL ENGINEERING

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

ME 502 REGISTRATION FOR USE OF FACILITIES (1-15)
SEC. 004 Dr. Monty Smith

ME 525 COMBUSTION AND CHEMICALLY REACTING FLOWS I (3)
SEC. 002
TEXT: Combustion Physics; Chung K. Law; Available from Amazon and Barnes and Noble.
TIME: Monday & Thursday 1:00 – 3:00 F252
PROFESSOR: Dr. Trevor Moeller

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. *(DE) Prerequisite(s): 522 and 541 or consent of instructor*

ME 529 APPLICATIONS OF LINEAR ALGEBRA IN ENGINEERING SYSTEMS (3)
SEC. 001 (Same as BE/CBE/ECE/IE/MSE 529)
TEXT: Advanced Linear Algebra for Engineers with MATLAB; Sohail A. Dianat and Eli S. Saber; CRC Press; Latest Edition; ISBN # 978-1-4200-9523-4
TIME: Pre-Recorded Video Lectures, Exam Periods TBA
PROFESSOR: Dr. Montgomery Smith

Methods of linear algebra as applied to engineering. Topics to be covered include: systems of linear equations, matrices, solutions of linear equations, Gaussian elimination, vector spaces, linear transformations, orthogonality, least-squares approximations, determinants, eigenvalues and eigenvectors, positive definite matrices, singular value decomposition, and numerical

computational methods. Course assignments will consist of pencil-and-paper exercises and numerical exercises involving MATLAB. Students registering for this course are expected to have access to at least The Student Edition of MATLAB.

***ME 587 DYNAMIC MODELING AND SIMULATION (3) CANCELLED**

SEC. 001 (Interactive Video) (Same as BE 587).

TEXT: An Introduction to Mathematical Modeling; Edward A. Bender; Dover Publications; ISBN# 0-486-41180-X

TIME: Wednesday & Friday 1:00 – 3:00 E111

PROFESSOR: Dr. Kenneth Kimble

Modeling and analysis of physical systems. Systems and parameter identification. Mathematical modeling methods and approximations.

Digital simulation techniques and practices. Design and control applications.

ME 590 SPECIAL TOPICS IN MECHANICAL ENGINEERING (3)

SEC. 001 Moeller

ME 590 SPECIAL TOPICS IN MECHANICAL ENGINEERING (3)

SEC. 002 Milt Davis

ME 590 SPECIAL TOPICS IN MECHANICAL ENGINEERING (3)

SEC. 003 Smith

ME 599 SPECIAL TOPICS: THEORY OF TURBULENCE (3)

SEC. 001 (Same as AE 532 Sec. 001)

TIME: Tuesday & Friday 9:30 – 11:30 E211

TEXT: H. Tennekes and J.L. Lumley; A First Course in Turbulence; MIT Press; Latest Ed; ISBN# 0262200198

PROFESSOR: Dr. Basil Antar

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

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

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

ME 599 SPECIAL TOPICS: VIBRATIONS AND WAVES (3)

SEC. 003

TIME: TBD

TEXT: TBD

PROFESSOR: Dr. John Steinhoff

Repeatability: May be repeated. Maximum 6 hours. Registration Permission: Consent of instructor.

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

PHYSICS

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

PHYS 501 GRADUATE RESEARCH PARTICIPATION (3)
SEC. 002
TEXT: TBD
TIME: Monday & Thursday 1:00 – 3:00 E211
PROFESSOR: Dr. Lloyd Davis

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

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

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

This course will cover a variety of materials not normally offered in the academic year and will be tailored to individual student needs. This summer we anticipate offering material in modern physics and introductory quantum mechanics. This will aid students who wish to take the core physics courses (521-22) in quantum mechanics. It will be tailored to the individual students' needs. Engineering students, including students in material science, are encouraged as well as students who wish to enter the physics program. Independently this course will serve those students preparing for the physics preliminary exam.

PHYS 599 SEMINARS: GENERAL RELATIVITY AND QUATERNIONS
RESEARCH PROBLEMS (1-3)
SEC. 001
TEXT: To Be Selected
TIME: TBD
PROFESSOR: Dr. Horace Crater

Mechanics; Radiation; Heat and Thermodynamics; Electricity and Magnetism; Modern Physics. *Repeatability: May be repeated with consent of department. Maximum 18 hours.*

PHYS 600 DISSERTATION (3, 6, or 9)

SEC. 001 Crater
003 Davis
004 Parigger
005 Chen
006 Lewis

PHYS 605 LASER SPECTROSCOPY (3)

SEC. 001 (Video Recorded)

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

TIME: Monday & Wednesday

1:00 – 3:00

E111

PROFESSOR: Dr. Christian Parigger

Applications of lasers to spectroscopy of atomic and molecular systems; absorption, laser-induced fluorescence, and Raman spectroscopy; molecular and atomic coherence, quantum beats, resonance fluorescence, photon echoes, self-induced transparency; saturation and Doppler-free spectroscopy; laser cooling and trapping. *Prereq: 521, 541.*