

Spring 2020 Registration Announcement

The University of Tennessee
Space Institute



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CALENDAR - 2020 SPRING SEMESTER

Priority Registration.....	October 14, 2019 – January 6, 2020
Admission to Candidacy Forms for Spring 2020 Commencement.....	December 4, 2019
Spring 2020 Graduation Application Deadline (submit online)	December 4, 2019
Graduation Fee Payment Deadline (MS \$30, PhD \$75)	December 4, 2019
Priority registration payment deadline 4:30 p.m. EST	January 6, 2020
Late Registration and late fee begins (\$100 Late Fee).....	January 8, 2020 – January 21, 2020
Classes begin.....	January 8, 2020
Last Day to final register, add, change grading options or drop without a “W”	January 17, 2020
Late registration payment deadline 4:30 p.m. EST	January 17, 2020
Martin Luther King Holiday	January 20, 2020
Late Registration and late fee begins (after 14 th day) (\$200 Late Fee) ..	January 22, 2020 - Forward
Preliminary Thesis/Dissertation Review Deadline	February 19, 2020
Spring Break (No Classes).....	March 16 - 20, 2020
Last day to schedule final exam (thesis/dissertation).....	March 26, 2020
Drop with a “W”	March 31, 2020
Last day to Defend (thesis/dissertation).....	April 2, 2020
No Class Day	April 9, 2020
Spring Recess (No Classes)	April 10, 2020
Thesis/Dissertation Deadline 5:00 p.m. EST (submitted and approved)	April 16, 2020
Thesis/Dissertation Approval Form.....	April 16, 2020
Dissertation Survey of Earned Doctorates Certificate	April 16, 2020
Submit Pass/Fail form (thesis/dissertation).....	April 16, 2020
Submit Pass/Fail form (non-thesis).....	April 22, 2020
All "INCOMPLETE" must be removed for Graduation.....	April 24, 2020
Deadline for Submission of Admission to Candidacy for students	
Graduating Summer 2020 and Graduation Application.....	April 24, 2020
Classes End	April 24, 2020
Total Withdraw from the University Deadline	April 24, 2020
Study Period.....	April 27, 2020
Exam Period.....	April 28, 29 & 30, 2020
Graduate Hooding Ceremony (UTK).....	May 7, 2020
COMMENCEMENT (UTK)	May 7 - 9, 2020
Official Graduation Date.....	May 9, 2020

Second thesis/dissertation deadlines

Defense Completed by April 24, 2020

Second Deadline Application Submitted by April 24, 2020

<https://gradschool.utk.edu/forms-central/second-deadline-graduation-application/>

Thesis/Dissertation Submitted and Accepted by 5:00 p.m. EST May 20, 2020

(Student will receive diploma summer 2020 semester, but will not be required to register for thesis/dissertation credits)

SUMMER SEMESTER 2020

Priority Registration.....	TBD
Final Registration	TBD
Memorial Day Holiday	May 25, 2020
Classes begin.....	May 28, 2020
No Class Day	July, 2, 2020
Independence Holiday.....	July 3, 2020
Classes End	August 7, 2020

REGISTRATION ANNOUNCEMENT SPRING SEMESTER 2020

REGISTRATION PROCEDURE

GRADUATE ACADEMIC ADVISING

Graduate students should contact your departmental faculty to arrange an advising appointment. If you're not accepted into a specific program, the assistant to the dean of graduate studies or the designee may act as your advisor. When the web registration system asks if you've discussed your program with your advisor, you must answer yes to continue with the registration process.

REGISTRATION

Students will register at <http://my.utk.edu>. You will need to log in using your NetID and your NetID password. If you do not know your NetID and NetID password, go to <http://onestop.utk.edu/your-classes/registering-for-classes/>.

*Log in to MyUTK. You can find a link by looking under "M" on the A-Z index (<http://www.utk.edu/alpha/>) or by typing myutk.utk.edu directly into your browser. You will need to log in by typing utk\your NetID in the "username" field and then your NetID password in the "password" field.

*Before you attempt to register, clear and pay any financial holds (parking tickets, library fines, fees, etc.).

*Look under the "For Your Review" heading on the MyUTK portal page (located in the upper right-hand corner) for notification of any holds you may have.

*Once you are logged into "My UTK," scroll down to "UTK Student Registration Links." Click on "Search for Classes" to look up sections and then register.

*Print a copy of your schedule when you are finished registering.

If you have any questions, call the Office of the University Registrar at 865-974-2101 or contact Charlene Hane in Student Services room D-100, phone 931-393-7228, email chane@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)-37234
Budget and Finance Office: 1-888-822-UTSI (8874)-37297
Student Services..... 1-888-822-UTSI (8874)-37228

APPLICATION FOR ADMISSION

No student will be allowed to register unless a completed Application 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 completed online at <https://www.applyweb.com/utg> and accompanied by a \$60.00 non-refundable application fee made payable to The University of Tennessee Space Institute. All applicants are required to

provide one official transcript of all undergraduate and graduate records, GRE test scores and three letters of recommendation when applying. International applicants will also need to include TOEFL scores. GRE scores are a requirement of all departments at UTSI except the Master of Science degree in Industrial Engineering/Engineering Management concentration. Please select UT Space Institute if you plan to attend the Tullahoma campus location. All applications need to be submitted online to the office of Graduate Admissions Knoxville, TN.

Graduate Research Assistantship applications need to be submitted to Clara Ferguson, Office of Admissions and Recruiting, University of Tennessee Space Institute, MS-6, Tullahoma, TN 37388-9700. Assistantship applications must include GRE test scores and three letters of recommendation. All International applicants will need to provide TOEFL test scores in addition to GRE's. Official transcripts and test scores should be sent to College Code 1843, Graduate Admissions Office, 201 Student Services Building, Knoxville, TN 37996-0221. Once admitted, a full admission will not be granted until all official test scores and degree confirmation are received in the Graduate Admissions Office in Knoxville. Please contact Clara Ferguson at (931) 393-7234 or 888-822-8874 ext. 37234 if you have questions.

TOTAL WITHDRAWAL 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 Charlene Hane, Student Services, 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 MyUTK or contact Charlene Hane, Student Services, Office D-100, (931) 393-7228.

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 Charlene Hane, Student Services 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/Summer semesters are considered full-time. Full-time enrollment (9 hours) for two consecutive semesters or part-time enrollment (6 hours) for 3 consecutive semesters is required to full fill the admission to candidacy doctoral degree residency requirement.

Graduate Research Assistants (GRAs) must be enrolled for 9 hours during the Fall/Spring semesters and 6 hours during the Summer in addition to one credit hour of seminar each semester in which seminars are offered, unless a waiver is granted by the Associate Executive Director.

REMOVAL OF INCOMPLETE GRADES

All Incomplete Grades (I) must be removed prior to graduation. The instructor, in consultation with the student, decides the terms for the removal of the I, including the time limit for removal. If the I is not removed within one calendar year, the grade will be changed to an F. The course will not be counted in the cumulative grade point average until a final grade is assigned. No student may graduate with an I on the record. Students planning to graduate Spring Semester 2019 must remove all INCOMPLETE GRADES by April 24, 2020. Contact Charlene Hane, Student Services, to remove an Incomplete Grade.

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 a completed and signed Admission to Candidacy Application at least one semester prior to receiving the degree.

Candidacy committee changes or course changes must be submitted to the committee chairman using a Revision form. If changing from a thesis option to a non-thesis option or vice versa, a new Admission to Candidacy Application must be submitted. All forms must be processed through Student Services.

DOCTORAL DEGREE:

A Doctoral Committee should be formed during the student's first year of doctoral study. Any changes to the doctoral committee (deletions or additions) must be submitted to the Committee Chairman using a Revision form for approval. Each doctoral student is responsible for submitting a completed Admission to Candidacy form signed by the doctoral committee at least one semester prior to receiving the degree. All forms must be processed through Student Services.

CONTINUOUS ENROLLMENT

All degree-seeking graduate students are expected to make a full commitment to their graduate and professional study in order to ensure that they can complete all degree requirements without unnecessary delay. Graduate students are therefore required to maintain an active status through continuous enrollment from the time of first enrollment until graduation.

Continuous enrollment is maintained by registering for a minimum of one graduate credit hour per semester (excluding the summer, unless stipulated otherwise by the program or department). However, students who have started taking dissertation hours (course 600) must maintain a minimum of three credit hours per semester during all semesters, including the summer, as stipulated in the policy on "Registration for Course 600 (Doctoral Research and Dissertation)" in order to comply with the Continuous Enrollment requirement (see under Doctoral Programs for details).

The minimum enrollment for international students may be different, and international students always need to check with the Center for International Education (CIE) in order to determine what minimum enrollment they need to maintain in order to satisfy all enrollment requirements attached to their specific visa.

CONSEQUENCES OF NON-ENROLLMENT WITHOUT LEAVE OF ABSENCE

Graduate students who do not maintain continuous enrollment as stipulated in the "Continuous Enrollment" policy will lose their active student status. A student who has lost his or her active status without having been granted a Leave of Absence for the period of non-enrollment ahead of time will not be allowed to continue in his her graduate program until readmitted. (see policy on "Readmission" in the Graduate Catalog for more details).

Non-enrollment other than during an approved Leave of Absence (LOA) does not alter or affect any of the milestone deadlines, such as admission to candidacy, time to degree, and other milestones depending upon the program.

Upon approval for readmission to complete the interrupted degree program, students will be retroactively enrolled in every semester of missed enrollment for one graduate credit hour of Course 502 or for three graduate credit hours of Course 600 (whichever is appropriate). Students will be responsible for paying the past tuition charges and fees as well as the current university per semester late registration penalty. All past due charges will need to be paid before the Graduate School will approve the student for any future enrollment. For more information, go to: https://catalog.utk.edu/content.php?catoid=27&navoid=3506#leave_absence_reinstate

FINAL EXAM 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 Student Services. Failure to notify Student Services 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 2019-2020 academic year is provided by United HealthCare Student Resources. The premium must be paid before registration. Contact the Student Services Office (room D-100 ext. 37228) 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

Study Day – April 27, 2020
Final Exams – April 28, 29 & 30, 2020

FINANCIAL CALENDAR, FEES, REFUNDS, AND TUITION

Please click <http://onestop.utk.edu/tuition-fees/> link to the most current information.

The UTSI Budget and Finance Accounts Receivable Office will no longer accept payment for tuition and fees by credit card. All students will need to login to MyUTK One Stop to make secure payments online.

Please see One Stop - Paying Tuition and Fees webpage for more details <http://onestop.utk.edu/pay/> .

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 at <http://catalog.utk.edu>. The student handbook "Hilltopics" is available online at <https://hilltopics.utk.edu/>

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

THE UNIVERSITY OF TENNESSEE POLICY ON A DRUG-FREE CAMPUS AND WORKPLACE

In support of the Drug-Free Workplace Act of 1988 (Public Law 100-690) and the Drug-Free Schools and communities Act of 1989, the University of Tennessee is notifying all students, faculty, and staff of the following university policy approved by the UT Board of Trustees on 21 June 1990.

It is the policy of the University of Tennessee to maintain a safe and healthful environment for its students and employees. Therefore, university policy prohibits the unlawful use, manufacture, possession, distribution, or dispensing of drugs ("controlled substances" as defined in the Controlled Substances Act, 21 U.S.C. 812) and alcohol on university property or during university activities.

Violation of this policy is grounds for disciplinary action--up to and including immediate discharge for an employee and permanent dismissal of a student. Federal and state laws provide additional penalties for such unlawful activities, including fines and imprisonment (21 U.S.C. 841 et seq.; T.C.A. 39-6-401 et seq.). Local ordinances also provide various penalties for drug- and alcohol-related offenses. The university is bound to take all appropriate actions against violators, which may include referral for legal prosecution or requiring the individual to participate satisfactorily in an approved drug use or alcohol abuse assistance or rehabilitation program.

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

**The University of Tennessee Space Institute
Spring 2020 Course Listings**

AEROSPACE ENGINEERING

AE	500	Master's Thesis (1-15)	
SEC.	009	CRN 23946	Abedi
	011	CRN 23947	Balas
	012	CRN 23948	Brooks
	013	CRN 23949	Kreth
	014	CRN 23950	Moeller
	015	CRN 23951	Schmisser
	016	CRN 23952	Solies
	021	CRN 23957	Vakili
	022	CRN 24873	Zhang

Grading Restriction: P/NP only.

Repeatability: May be repeated.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

AE	502	Registration for Use of Facilities (1-15)	
SEC.	002	CRN 23959	Moeller

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate

AE	512	Viscous Flow (3)		
SEC.	001	CRN 23960		
TEXT:	TBD			
TIME:	Tuesday & Thursday	2:40 – 3:55		E-113
PROF:	Dr. Mark Gragston			

Derivation of fundamental equations of compressible viscous flow; boundary conditions for viscous heat-conducting flow; exact solutions for Newtonian viscous flow (Navier-Stokes) equations for special cases; similarity solutions. Thermal boundary layers, stability of laminar flows, transition to turbulence, 2-D turbulent boundary layer equations. Incompressible-turbulent mean flow, and compressible boundary layer flow.

Registration Permission: Consent of instructor.

AE 525 Hypersonic Flow (3)
SEC. 001 CRN 33254
TEXT: TBD
TIME: Monday & Wednesday 8:40 – 9:55 E-111
PROF: Dr. John Schmisser

Slender body flow; similitude; Newtonian theory; blunt body flow; viscous interactions; free molecule and rarefied gas flow.

(DE) Prerequisite(s): 512

AE 557 Aerospace Vehicle Flutter and Vibration (3)
SEC. 001 CRN 30148
TEXT: *Aircraft Vibration and Flutter*; Scanlan, R.H. and Rosenbaum, R; Dover Publications; New York, NY; 1968
TIME: Tuesday and Friday 1:00 – 2:15 E-111
PROF: Dr. Peter Solies

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

(DE) Prerequisites 551.

AE 590 Selected Engineering Problems (2-6)
SEC. 001 CRN 23965 Abedi
003 CRN 23966 Balas
004 CRN 25289 Brooks
005 CRN 25290 Kreth
006 CRN 25291 Moeller
007 CRN 25292 Schmisser
008 CRN 25293 Solies
009 CRN 25294 Vakili
010 CRN 27266 Zhang

Repeatability: May be repeated. Maximum 6 hours.

Comment(s): Enrollment limited to students in problems option.

Registration Permission: Consent of advisor.

AE 595 Aerospace Engineering Seminar (1)
SEC. 001 CRN 23967
TEXT: None
TIME: Will be announced through email
PROF: Dr. Trevor Moeller

All phases of aerospace engineering, reports on current research at the University of Tennessee, Knoxville, and UTSI.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 20 hours.

AE 599 Special Topics: Atmospheric Sciences for Aerospace & Mechanical Engineers (3)
SEC. 001 CRN 23969 (Same as ME 599 002 CRN 26621)
TEXT: *Atmospheric Science: An Introductory Survey*; Wallace and Hobbs; Academic Press; 2nd Edition; February 15, 2006; ISBN 13: 978-0127329512

TIME: Monday & Wednesday 1:00 – 2:15 E-111
PROF: Dr. Steve Brooks

Structure of the atmosphere, energy balance, turbulence, satellite drag, hypersonic flight in the upper atmosphere, aircraft icing and volcanic ash hazards. These topics will be extended to the Venusian, Martian and Jovian atmospheres.

Repeatability: May be repeated. Maximum 6 hours.

AE 599 Special Topics: Computer Methods in Dynamics of Continua (3)
SEC. 003 CRN 26620 (Same as ME 599 013 CRN 27651)
TEXT: There is no required textbook and I'll provide course notes to students. There are also some recommended textbooks in the syllabus which are copied here as well:

[Strikwerda, 2004] Strikwerda, J. C. (2004). Finite difference schemes and partial differential equations. SIAM.

[Hughes, 2012] Hughes, T. J. (2012). The finite element method: linear static and dynamic finite element analysis. Courier Corporation.

[Bathe, 2006] Bathe, K.-J. (2006). Finite element procedures. Klaus-Jurgen Bathe.

[Farlow, 2012] Farlow, S. J. (2012). Partial differential equations for scientists and engineers. Courier Corporation.

[LeVeque, 2002] LeVeque, R. L. (2002). Finite Volume Methods for Hyperbolic Problems. Cambridge University Press.

[Chapra and Canale, 2010] Chapra, S. C. and Canale, R. P. (2010). Numerical methods for engineers, volume 2. McGraw-Hill. 6th edition.

TIME: Monday & Wednesday 1:10 – 2:25 E-110
PROF: Dr. Reza Abedi

This course is intended to serve as a sequel to an introductory finite element or computational mechanics courses. It is designed to deepen student's understanding of the characteristics of elliptic, parabolic, and hyperbolic partial differential equations (PDE) and get familiar with solution techniques for dynamic problems.

Course Objectives

Provide sufficient mathematical background to read the current literature and understand new developments in the field.

Familiarize the students with various numerical schemes for continuum dynamics.

Relate theory to practical applications in computational science and engineering.

Develop the student's capabilities for technical communication and independent research in computational science and engineering.

Repeatability: May be repeated. Maximum 6 hours.

AE 599 Special Topics: Data Measurement and Analysis (3)
SEC. 008 CRN 25918 (Same as ME 599 029 CRN 33098)
TEXT: *Random Data: Analysis and Measurement Procedures*; Julius S. Bendat and Allan G. Piersol; Wiley; 4th Ed.; ISBN 978-0-470-24877-5; COST OF TEXTBOOK(s): \$133.03 (new, via Amazon)
TIME: Monday & Wednesday 10:10 – 11:25 E-111
PROF: Dr. Phil Kreth

Tools for random data analysis (including types of random data, mean values, mean-square values, probability density and distribution functions, moments and characteristic functions, spectral and

correlation analyses); bias and random error estimates in data measurements; input-output system models; measurement examples.

Repeatability: May be repeated. Maximum 6 hours.

AE 599 Special Topics: Aircraft Flight Control (3)

SEC. 013 CRN 28668

TEXT: Nelson, Robert C; *Flight Stability and Automatic Control*; 2nd Edition 1988 or newer; McGraw-Hill, NY; 1988; ISBN 0-07-046273-9

TIME: Tuesday & Friday 11:00 – 12:15

E-111

PROF: Dr. Peter Solies

Static and dynamic longitudinal, directional, and lateral stability of aerospace vehicles will be investigated. Topics include contribution of vehicle components to stability and control, motion with fixed and free control surfaces, steady flight and maneuvering flight, flight test techniques, and introduction to control theory and design of automatic controls.

Repeatability: May be repeated. Maximum 6 hours.

AE 600 Doctoral Research/Dissertation (3-15)

SEC. 007 CRN 23977 Abedi

008 CRN 23978 Balas

009 CRN 23979 Brooks

010 CRN 23980 Kreth

013 CRN 23983 Moeller

015 CRN 25295 Schmisser

017 CRN 23985 Solies

018 CRN 25060 Vakili

020 CRN 32373 Zhang

Grading Restriction: P/NP only.

Repeatability: May be repeated.

Registration Restriction(s): Minimum student level – graduate.

AE 601 Doctoral Research Methodology (3)

SEC. 002 CRN 28551

TEXT: TBD

TIME: TBD

PROF: Dr. Kivanc Ekici

Methods of planning and conducting original research and proposal writing.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: Maximum 6 hours. May be repeated once.

Registration Restriction(s): Minimum student level – graduate / doctoral students.

Registration Permission: Departmental approval.

AE 690 Advanced Topics: Discontinuous Galerkin Finite Element Methods (3)

SEC. 004 CRN 26835

TEXT: None

TIME: Monday & Wednesday 11:40 – 12:55

E-110

PROF: Dr. Reza Abedi

This course is intended to serve as a sequel to an introductory finite element method (FEM) course where conventional (continuous) FEM method is covered. The main difference of Discontinuous Galerkin (DG) methods to continuous FEMs the weak enforcement of jump conditions on the boundary of the elements. DG methods generally are more stable and perform better for dynamic problems involving shocks and other discontinuities. In this course we cover:

1. Rankine-Hugoniot jump conditions for conservation laws; Exact and some approximate Riemann solution schemes.
2. Differential forms (exterior calculus) to objectively express and combine space and time quantities.
3. Finite element formulation for DG methods.
4. Computational geometry aspects of DG methods (mesh smoothing, h-, p-, and hp-adaptive operations, moving boundaries, etc.).
5. Object-oriented design and implementation of DG (and FEM) methods

Repeatability: May be repeated. Maximum 9 hours.

Registration Restriction(s): Minimum student level – graduate.

Registration Permission: Consent of instructor.

AVIATION SYSTEMS

AVSY 516 Aircraft Flight Controls (Same as AE 599 013 CRN 28668) (3)

SEC. 001 CRN 24035

TEXT: Nelson, Robert C; *Flight Stability and Automatic Control*; 2nd Edition 1988 or newer; McGraw-Hill, NY; ISBN 0-07-046273-9

TIME: Tuesday & Friday

11:00 – 12:15

E-111

PROF: Dr. Peter Solies

Static and dynamic longitudinal, directional, and lateral stability of aerospace vehicles will be investigated. Topics include contribution of vehicle components to stability and control, motion with fixed and free control surfaces, steady flight and maneuvering flight, flight test techniques, and introduction to control theory and design of automatic controls.

BIOMEDICAL ENGINEERING

BME 500 Master's Thesis (1-15)

SEC. 012 CRN 25804 Johnson

Grading Restriction: P/NP only.

Repeatability: May be repeated.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

BME 505 All Things Carbon (3)

SEC. 001 CRN 33064

TEXT: None

TIME: Zoom

PROF: Dr. Jackie Johnson

Carbon is the basis of life; as such biomedical engineering students have the ability to study this element along with associated biological applications. Diamond-like carbon has potential as a coating for orthopedic implants. Nano-crystalline diamond can be used as a biosensor. Carbon nanotubes have applications in pharmacy and medicine due to their large surface area. Carbon is a suitable coating for

magnetic nanoparticles, which can be used for hyperthermia and magnetic resonance imaging. In summary, the ability of carbon to enhance medical diagnostics and treatment is wide-ranging and not fully exploited. Students will learn current applications of carbon in medicine and be able to project future uses once this course is completed.

BME 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 001 CRN 24061 (Video Recorded)
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
COST OF TEXTBOOK(s): \$135.00 Hardback, \$52.16 eBook, PDF available via UTK
University Libraries OneSearch
TIME: Tuesday & Friday 9:30 – 10:45 E-111
PROF: Dr. Monty Smith

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion, LU decomposition. Vector spaces: spanning sets, orthogonality, QR factorization, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Chemical and Biomolecular Engineering 529; Civil Engineering 529, Electrical and Computer Engineering 529; Environmental Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529; Nuclear Engineering 529).

Comment(s): Graduate standing or consent of instructor required.

BME 560 Tissue Engineering and Regenerative Medicine (3)
SEC. 002 CRN 33260
TEXT: TBD
TIME: Tuesday & Thursday 1:10 – 2:25 Zoom
PROF: Dr. Sara Hanrahan

Develop an understanding of cell-cell interactions and the role of the extracellular matrix in the structure and function of normal and pathological tissues. Topics include the harvesting of stem cells from specific tissues, the use of artificial and natural scaffolds in three-dimensional tissue culture, and the role of maintaining the stem cell state in culture.

(DE) Prerequisite(s): 503, 511, 521.

BME 590 Selected Biomedical Engineering Problems (2-6)
SEC. 001 CRN 26717 Johnson

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 6 hours.

Comment(s): Enrollment is limited to students in the non-thesis option.

Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate.
Registration Permission: Consent of instructor.

BME 595 Biomedical Seminar (1)
SEC. 002 CRN 25942
TEXT: None
TIME: Will be announced through email
PROF: Dr. Jacqueline Johnson

All phases of biomedical engineering, reports on current research at UTK and UTSL.
Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 20 hours.
Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate

BME 600 Doctoral Research/Dissertation (3-15)
SEC. 011 CRN 25805 Johnson

Grading Restriction: P/NP only.
Repeatability: May be repeated.
Registration Restriction(s): Minimum student level – graduate.

BME 601 Doctoral Research Methodology (3)
SEC. 002 CRN 28552
TEXT: TBD
TIME: TBD
PROF: Dr. Jeffery Reinbolt

Intensive, individualized experience in reviewing literature, evaluating experimental or theoretical methods, planning a research project, and presenting research project plans orally and in writing.
Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: Maximum 6 hours. May be repeated once.
Registration Restriction(s): Minimum student level – graduate. PhD students only.
Registration Permission: Consent of instructor.

ENGINEERING MANAGEMENT

EM 500 Master's Thesis (1-15)
SEC. 001 CRN 27294 Simonton
002 CRN 28434 Yu

Grading Restriction: P/NP only.
Repeatability: May be repeated.
Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate.

EM 501 Capstone Project (3-6)
SEC. 001 CRN 21978 Tolk UT Space Institute Campus
005 CRN 33293 Tolk UT Distance Education Campus

Application-oriented project to show competence in major academic area.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 6 hours.

Comment(s): Requires enrollment in engineering management.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

EM 502 Registration for Use of Facilities (1-15)
SEC. 001 CRN 21979 Simonton
002 CRN 29139 Yu

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated.

Credit Restriction: May not be used toward degree requirements.

Credit Level Restriction: Graduate credit only.

Registration Restriction(s): Minimum student level – graduate.

EM 533 Theory and Practice of Engineering Management (3)
SEC. 001 CRN 21980 UT Space Institute Campus
002 CRN 21981 UT Knoxville Campus
003 CRN 21982 Distance Education Campus

TEXT: Required: *Organizational Behavior*; Fred Luthans; McGraw-Hill Irwin; 13th Edition, ISBN-13: 978-1681231204 ISBN-10: 1681231204
References: *The Fifth Discipline*, Peter M. Senge, ISBN-10: 9780385517256 ISBN-13: 978-0385517256

TIME: Monday 4:00 – 6:35 E-113
PROF: Dr. Denise Jackson

Principles of engineering management, including: business and organization design, culture, leadership, marketing and competition in global economy, motivation and performance management, empowerment, organizational behavior, and diversity. Systems thinking, learning organizations, and systems dynamics modeling. Principle application to work settings and case studies.

EM 534 Financial Management for Engineering Managers (3)
SEC. 001 CRN 21984 UT Space Institute Campus
002 CRN 21985 UT Knoxville Campus
003 CRN 21986 Distance Education Campus

TEXT: TBD

TIME: Monday 10:00 – 12:30 E-113
PROF: Dr. Andrew Yu

Financial and managerial accounting in engineering and technology management. Transaction recording, financial statements, ratios and analysis, activity-based accounting, and standard practices for costing, budgeting, assessment, and control.

EM 538 New Venture Formation (3)
SEC. 001 CRN 27301 UT Space Institute Campus
002 CRN 27302 UT Knoxville Campus
003 CRN 27303 Distance Education Campus

CANCELLED

TEXT: TBD
TIME: Tuesday 10:30 – 12:30 E-113
PROF: TBD

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

Recommended Background: Graduate standing in Engineering or Business.

EM 541 Managing Change and Improvement in Technical Organizations (3) **CANCELLED**
SEC. 001 CRN 21988 UT Space Institute Campus (Pre-recorded)
002 CRN 21989 UT Knoxville Campus
003 CRN 21990 Distance Education Campus

TEXT: TBD
TIME: Thursday 10:30 – 12:30 E-113
PROF: TBD

Current topics, theories, and applications for managing change and innovation for performance improvement in organizations. Multi-initiative approaches: quality management, organizational effectiveness, employee empowerment, performance measurement, and application of statistical tools and techniques. Self-assessment and Baldrige criteria for performance excellence. Change agent, team building, and leadership issues. Case studies.

Recommended Background: Graduate standing in Engineering or Business.

EM 600 Doctoral Research/Dissertation (3-15)
SEC. 001 CRN 25030 Simonton UT Space Institute Campus
006 CRN 32386 Simonton Distance Education Campus
003 CRN 28444 Yu UT Space Institute Campus
007 CRN 33291 Yu Distance Education Campus

Grading Restriction: P/NP only.

Repeatability: May be repeated.

Registration Restriction(s): Minimum student level – graduate.

EM 601 Systems Theory and Engineering (3)
SEC. 001 CRN 31865 UT Space Institute Campus
002 CRN 31866 UT Knoxville Campus
003 CRN 31867 Distance Education Campus
TIME: Tuesday 10:30 – 12:30 E-113
TEXT: *Systems Engineering Principles and Practice*, Alexander Kossiakoff, William N. Sweet, Sam Seymour, Steven M. Biemer, 2nd edition, Wiley Publisher ISBN #978-1-119-09504-0
Amazon ISBN #13: 978-0470405482
PROF: Dr. James Simonton

Technology course that will examine theoretical foundations of General System Theory applied to engineering and organizational enterprises addressing issues concerning systems, the effectiveness of organizations in the context of traditional management related issues, as well as incorporating the critical impact of systems thinking on the socio-technical environment. Among the topics to be covered in the course are: the meaning of General Systems Theory (GST); GST and the unity of science; the concept of Equifinality; the characteristics and modeling of open systems; the concepts of the Learning Organization; the principle of Leverage; building Learning Organizations; and issues related to Socio-

Technical Systems. Systems Engineering focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem including operations, performance, test, manufacturing, cost, and schedule. This subject emphasizes the links of systems engineering to fundamentals of decision theory, statistics, and optimization.

(RE) Prerequisite(s): 533.

Registration Restriction(s): Minimum student level – graduate.

INDUSTRIAL ENGINEERING

IE 529 Applications of Linear Algebra in Engineering Systems (3)
 SEC. 001 CRN 21706 (Video Recorded)
 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
 COST OF TEXTBOOK(s): \$135.00 Hardback, \$52.16 eBook, PDF available via UTK University Libraries OneSearch
 TIME: Tuesday & Friday 9:30 – 10:45 E-111
 PROF: Dr. Monty Smith

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion, LU decomposition. Vector spaces: spanning sets, orthogonality, QR factorization, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Chemical and Biomolecular Engineering 529; Civil Engineering 529, Electrical and Computer Engineering 529; Environmental Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529; Nuclear Engineering 529).

Comment(s): Graduate standing or consent of instructor required.

MECHANICAL ENGINEERING

ME 500 Master's Thesis (1-15)
 SEC. 001 CRN 21580 Abedi
 021 CRN 21600 Balas
 022 CRN 21601 Brooks
 023 CRN 21602 Kreth
 024 CRN 21603 Moeller
 025 CRN 21604 Schmisser
 026 CRN 21605 Solies
 034 CRN 25526 Vakili
 035 CRN 27280 Zhang

Grading Restriction: P/NP only.
Repeatability: May be repeated.
Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate.

ME 502 Registration for Use of Facilities (1-15)
SEC. 002 CRN 25081 Moeller

Required for the student not otherwise registered during any semester when student uses university facilities and/or faculty time before degree is completed.

Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated.
Credit Restriction: May not be used toward degree requirements.
Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate.

ME 512 Convection Heat Transfer (3)
SEC. 001 CRN 21616
TEXT: Adrian Bejan; *Convection Heat Transfer*; 4th Edition; John Wiley

Reference:

R.B. Bird, W.E. Stewart, and E.N. Lightfoot, *Transport Phenomena*, Second Edition, Wiley, 2001. F.P. Incropera, D.P. DeWitt, T.L. Bergman and A.S. Lavine, *Fundamentals of Heat and Mass Transfer, Sixth Edition*, John Wiley & Sons, 2006.

TIME: Monday & Wednesday 2:40 –3:55 E-110
PROF: Dr. Feng Yuan Zhang

Models and equations for fluid motion, the general energy equation, and transport properties. Exact, approximate, and boundary layer solutions for laminar flow heat transfer problems. Heat transfer in internal and external forced and buoyancy driven flows. Application of similarity concepts and analogies to convection heat transfer.

Recommended Background: Undergraduate heat transfer course.

ME 529 Applications of Linear Algebra in Engineering Systems (3)
SEC. 001 CRN 21620 (Video Recorded)
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
COST OF TEXTBOOK(s): \$135.00 Hardback, \$52.16 eBook, PDF available via UTK University Libraries OneSearch

TIME: Tuesday & Friday 9:30 – 10:45 E-111
PROF: Dr. Monty Smith

Methods of linear algebra with application to engineering problems. Systems of linear equations: matrix-vector notation, solutions to linear equations, determinants, matrix inversion, LU decomposition. Vector spaces: spanning sets, orthogonality, QR factorization, linear transformations. Eigenvalues and eigenvectors: characteristic polynomials, singular value decomposition. The Cayley-Hamilton theorem: matrix polynomials, functions of matrices. Optimization: least-squares and weighted least-squares methods.

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of

linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.

Cross-listed: (Same as Chemical and Biomolecular Engineering 529; Civil Engineering 529, Electrical and Computer Engineering 529; Environmental Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529; Nuclear Engineering 529).

Comment(s): Graduate standing or consent of instructor required.

ME 570 Numerical Methods for Engineers (3)
SEC. 001 CRN 28707
TEXT: TBD
TIME: Tuesday & Thursday 1:10 – 2:25 E-110
PROF: Dr. Kivanc Ekici

Review and implementation of basic numerical techniques. Explicit and implicit solution techniques of ordinary differential equations and partial differential equations. Applications include heat transfer and fluid mechanics.

Recommended Background: Numerical analysis, fluid mechanics, heat transfer and differential equations.

Registration Permission: Consent of Instructor.

ME 590 Selected Engineering Problems (2-6)
SEC. 002 CRN 21626 Abedi
003 CRN 25514 Balas
005 CRN 25515 Brooks
006 CRN 25516 Kreth
007 CRN 25517 Moeller
008 CRN 25518 Schmisser
009 CRN 25519 Solies
010 CRN 25520 Vakili
011 CRN 25521 Zhang

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 6 hours.

Comment(s): Enrollment limited to students in problems option.

Registration Permission: Consent of advisor.

ME 595 Mechanical Engineering Seminar (1)
SEC. 001 CRN 21627
TEXT: None
TIME: Will be announced through email
PROF: Dr. Trevor Moeller

All phases of mechanical engineering, reports on current research at the University of Tennessee, Knoxville, and the University of Tennessee Space Institute.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: May be repeated. Maximum 20 hours.

ME 599 Special Topics: Atmospheric Sciences for Aerospace and Mechanical Engineers (3)
SEC. 002 CRN 26621 (Same as AE 599 001 CRN 23969)
TEXT: *Atmospheric Science: An Introductory Survey*; Wallace and Hobbs; Academic Press; 2nd Edition; February 15, 2006; ISBN 13: 978-0127329512

TIME: Monday & Wednesday 1:00 – 2:15 E-111
PROF: Dr. Steve Brooks

Structure of the atmosphere, energy balance, turbulence, satellite drag, hypersonic flight in the upper atmosphere, aircraft icing and volcanic ash hazards. These topics will be extended to the Venusian, Martian and Jovian atmospheres.

Repeatability: May be repeated. Maximum 6 hours

Registration Permission: Consent of instructor.

ME 599 Special Topics: Computer Methods in Dynamics of Continua (3)

SEC. 013 CRN 27651 (Same as AE 599 003 CRN 26620)

TEXT: There is no required textbook and I'll provide course notes to students. There are also some recommended textbooks in the syllabus which are copied here as well:
[Strikwerda, 2004] Strikwerda, J. C. (2004). Finite difference schemes and partial differential equations. SIAM.
[Hughes, 2012] Hughes, T. J. (2012). The finite element method: linear static and dynamic finite element analysis. Courier Corporation.
[Bathe, 2006] Bathe, K.-J. (2006). Finite element procedures. Klaus-Jurgen Bathe.
[Farlow, 2012] Farlow, S. J. (2012). Partial differential equations for scientists and engineers. Courier Corporation.
[LeVeque, 2002] LeVeque, R. L. (2002). Finite Volume Methods for Hyperbolic Problems. Cambridge University Press.
[Chapra and Canale, 2010] Chapra, S. C. and Canale, R. P. (2010). Numerical methods for engineers, volume 2. McGraw-Hill. 6th edition.

TIME: Monday & Wednesday 1:10 – 2:25 E-110
PROF: Dr. Reza Abedi

This course is intended to serve as a sequel to an introductory finite element or computational mechanics courses. It is designed to deepen student's understanding of the characteristics of elliptic, parabolic, and hyperbolic partial differential equations (PDE) and get familiar with solution techniques for dynamic problems.

Course Objectives

Provide sufficient mathematical background to read the current literature and understand new developments in the field.

Familiarize the students with various numerical schemes for continuum dynamics.

Relate theory to practical applications in computational science and engineering.

Develop the student's capabilities for technical communication and independent research in computational science and engineering.

Repeatability: May be repeated. Maximum 6 hours.

Registration Permission: Consent of instructor.

ME 599 Special Topics: Data Measurement & Analysis (3)

SEC. 029 CRN 33098 (Same as AE 599 008 CRN 25918)

TEXT: Random Data: Analysis and Measurement Procedures; Julius S. Bendat and Allan G. Piersol; Wiley; 4th Ed.; ISBN 978-0-470-24877-5; COST OF TEXTBOOK(s): \$133.03 (new, via Amazon)

TIME: Monday & Wednesday 10:10 – 11:25 E-111
PROF: Dr. Phil Kreth

Tools for random data analysis (including types of random data, mean values, mean-square values, probability density and distribution functions, moments and characteristic functions, spectral and

correlation analyses); bias and random error estimates in data measurements; input-output system models; measurement examples.

Repeatability: May be repeated. Maximum 6 hours.

Registration Permission: Consent of instructor.

ME	600	Doctoral Research/Dissertation (3-15)	
SEC.	015	CRN 21645	Abedi
	016	CRN 21646	Balas
	018	CRN 21648	Brooks
	019	CRN 21649	Kreth
	027	CRN 21657	Moeller
	028	CRN 21658	Schmisser
	029	CRN 25522	Solies
	030	CRN 25523	Vakili
	039	CRN 32702	Zhang

Grading Restriction: P/NP only.

Repeatability: May be repeated.

Registration Restriction(s): Minimum student level – graduate.

ME	601	Doctoral Research Methodology (3)	
SEC.	002	CRN 28553	
TEXT:	TBD		
TIME:	TBD		
PROF:	Dr. Kivanc Ekici		

Methods of planning and conducting original research and proposal writing.

Grading Restriction: Satisfactory/No Credit grading only.

Repeatability: Maximum 6 hours. May be repeated once.

Registration Restriction(s): Minimum student level – doctoral student.

Registration Permission: Departmental approval.

ME	610	Advanced Topics in Thermal/Fluid Science (3)		
SEC.	008	CRN 30104		
TEXT:	TBD			
TIME:	Tuesday & Thursday		10:10 – 11:25	E-110
PROF:	Dr. Jay Frankel			

Advanced theory and applications in the thermal/fluid sciences.

Repeatability: May be repeated. Maximum 9 hours.

Registration Restriction(s): Minimum student level – graduate.

Registration Permission: Consent of instructor.

PHYSICS

Phys	500	Master's Thesis (1-15)	
SEC.	002	CRN 23438	Davis
	003	CRN 23439	Parigger

Grading Restriction: P/NP only.

Repeatability: May be repeated.

Credit Level Restriction: Graduate credit only.
Registration Restriction(s): Minimum student level – graduate.

Phys 503 Physics Colloquium (1)
SEC. 002 CRN 23446
TEXT: Classic texts and literature
TIME: 2nd & 4th Thursday TBD TBD
PROF: Dr. Christian Parigger

Lectures and discussion on current research topics. Continuous registration required for current graduate students.

Grading Restriction: Satisfactory/No Credit grading only.
Repeatability: May be repeated. Maximum 6 hours.

Phys 541 Electromagnetic Theory (3)
SEC. 002 CRN 24775
TEXT: I will use four book references: the first one is the major course book. (1) M. Chaichian et al. “Electrodynamics – An Intensive Course”, Springer Verlag, 2016, ISBN 978-3-642-17380-6 ISBN 978-3-642-17381-3 (eBook) DOI 10.1007/978-3-642-17381-3 (2) W. Greiner “Classical Electrodynamics”, Springer Verlag, New York, NY, USA, ISBN 0-387-94799-X (3) B. Thidé “Electromagnetic Field Theory”, Upsilon books, Uppsala, SE, www.plasma.uu.se/CED; (4) J.D. Jackson “Classical Electrodynamics”, Wiley, NH, USA, 3rd Ed. ISBN 047130932X
TIME: Thursday TBD E-111
PROF: Dr. Christian Parigger

Review of electrostatics, magnetostatics, and quasi-static problems; Maxwell’s field equations and their solutions in dielectric and conducting media; electrodynamics and relativity, retarded potentials and gauge transformations, radiation produced by accelerating charges.

(DE) Prerequisite(s): 571.

Phys 600 Doctoral Research/Dissertation (3-15)
SEC. 002 CRN 23465 Davis
003 CRN 23466 Parigger

Grading Restriction: P/NP only.
Repeatability: May be repeated.
Registration Restriction(s): Minimum student level – graduate.

Phys 642 Adv. Top: Analysis of Laboratory & Stellar Astrophysics Spectra (3)
SEC. 003 CRN 26825
TEXT: Lecture notes and current literature
TIME: Thursday TBD E-111
PROF: Dr. Chris Parigger

Advanced theoretical or experimental topics not covered in other courses.

Repeatability: May be repeated with consent of department. Maximum 9 hours.

Registration Restriction(s): Minimum student level – graduate.

Phys 642 Adv. Top: Nanophotonics (3)
SEC. 005 CRN 31855
TEXT: https://www.amazon.com/Principles-Nano-Optics-Lukas-Novotny-ebook/dp/B00INYGCQG/ref=mt_kindle?_encoding=UTF8&me=
Principles of Nano-Optics 2nd Edition, by Lukas Novotny (Author), Bert Hecht (Author)

TIME: Tuesday & Thursday
PROF: Dr. Lloyd Davis

1:10 – 2:25

Zoom

Optical phenomena on the nanometer scale, in nanoscience, and in nanotechnology; sub-diffraction microscopy, near-field probes, plasmonics/surface plasmons, forces in confined fields.

Advanced theoretical or experimental topics not covered in other courses.

Repeatability: May be repeated with consent of department. Maximum 9 hours.

Registration Restriction(s): Minimum student level – graduate.