

The University of Texas at Arlington

# ELECTRICAL ENGINEERING

## GRADUATE PROGRAM

Advising Office  
Nedderman Hall, Room 501  
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Arlington, Texas 76019  
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Graduate Advisors:  
Dr. Alan Davis  
adavis@uta.edu  
Dr. Stephen Gibbs  
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<http://www-ee.uta.edu>  
Graduate Catalog at <http://www.uta.edu/orgs>

**Information for New or Prospective Students**

*This document has been prepared to assist the new or prospective student in acquiring an understanding of the graduate program in Electrical Engineering offered at The University of Texas at Arlington. Answers to often-asked questions are provided, but it serves only as a supplement to the UTA Graduate Catalog.*

*The Catalog is the authoritative source of university information. You should become familiar with it and consult it for answers to questions regarding policies, regulations, and course descriptions. Information of special interest to EE students will be posted outside the Advising Office (Room 501). Any questions should be directed to Dr. Davis, Dr. Gibbs or the staff of the EE Advising Office.*

## **The University, College, and Department**

The University of Texas at Arlington is situated in the center of the Dallas/Fort Worth Metroplex, the heart of the North Texas technology region. The university, a component of the University of Texas System, has nearly 25,000 students enrolled in 52 Bachelor Degree programs, 74 Master Degree programs, and 34 Ph.D. Degree programs. It is the sixth largest university in Texas.

The College of Engineering, with approximately 4,000 students, is the third largest in Texas. The college presently has approximately 100 faculty members. The goals of the college are to provide quality engineering education at both the undergraduate and graduate levels and to provide a research and educational resource especially to technology-based enterprises in North Texas.

UTA is emerging as a major research institution. The Department of Electrical Engineering has laboratories, offices and classrooms in the College of Engineering. Research facilities of the Department of Electrical Engineering are included in the following institutes, research centers, and laboratories: The Automation and Robotics Research Institute; Human Performance Institute; ElectroOptics Research Center; Energy Systems Research Center; National Science Foundation Center for Electronic Materials, Devices and Systems; Wave Scattering Research Center; and the Digital Image Processing; Image Processing and Neural Networks; Magnetic Resonance Imaging, and Systems; Controls and Manufacturing Laboratories. Current externally funded research programs in the EE Department amount to nearly \$2 million per year.

The EE Department has undergone many changes in the areas of instruction and research since the first class of 14 students graduated in 1961, and it is now one of the largest in the state. There are over 80 graduating seniors and 170 advanced degrees awarded in the EE Department every year.

The department goals for the future are to provide the very best possible education in electrical engineering allowing the graduate to choose from a large variety of career options. We maintain very important relationships with industry which include co-op programs, adjunct lecturers, and research programs. Every attempt is made to keep our program relevant to the technical needs and challenges of the future.

The Electrical Engineering Graduate Program is managed by the Graduate Advisors, Dr. Alan Davis and Dr. Stephen Gibbs, assisted by the Advising Office Staff. Students seeking consultation should contact the Advising Office for more information regarding advisor schedules. The EE Advising Office hours are Monday - Friday 8 AM to 12 Noon and 1 PM to 5 PM.

## **Financial Aid**

Graduate Research and Teaching Assistantships (GRA/GTA) are awarded on a competitive basis. The GTA or GRA cannot be awarded to probationary or provisional students. In addition, GTAs are not usually awarded the first semester. Graduate Research Assistantships are awarded at the discretion of individual faculty members and are subject to available funding. They are very competitive and are typically obtained by contacting the professor once you are on campus, enrolled as a full-time graduate student. If you are interested in other types of financial aid, you may contact:

The University of Texas at Arlington  
Financial Aid Office  
Box 19199  
Arlington, TX 76019

## **Admission Criteria**

The admission process considers all of the application material including official transcripts, GRE scores, letters of recommendation and the statement of purpose. No single objective factor is used to finalize the decision for admission or to deny admission. An attempt will be made to match the technical aspirations of the potential graduate students with the departmental resources in order to provide a stimulating academic environment for the students and their graduate education.

Admission decisions will be based on the following criteria:

1. *Admission with Unconditional status:* A typical applicant who is “admitted” into the graduate program will have met the following admission requirements.
  - The minimum undergraduate GPA requirement
    - For MSEE admission 3.25 (on a 4.0 scale) based on upper division course work (junior and senior level or equivalent)

- For Ph.D. admission 3.5 based on MSEE or equivalent
- Relevance of the student's undergraduate degree (background) to the EE curriculum.
- Rigor of the student's Bachelors degree.
- Reputation of the University/College that the student has received his/her previous degrees
- For Ph.D. applicants, the publications in scholarly conferences/journals are optional, but will improve both a student's chances of securing admission and receiving financial support.
- Three recommendation letters from individuals who can judge the probability of success of the student's graduate study.
- GRE scores of at least the following:
  - a. Quantitative score  
 $\geq 720$  for MS  
 or  
 $\geq 750$  for Ph.D.
  - b. Verbal score  $\geq 500$
  - c. Analytical Writing  $\geq 4$
- For an International Student, an additional requirement beyond those stated above:  
 TOEFL  $\geq 560$  for the paper and pencil test, 220 for the computer-based test, and 79 for the Internet-based test.
- 2. *Admission with Provisional status:* An applicant unable to supply all required official documentation prior to the admission deadline, but whose available documentation otherwise appears to meet admission requirements may be granted provisional admission.
- 3. *Deferred status:* A deferred decision may be granted when a file is incomplete.
- 4. *Denied status:* An applicant that does not meet categories 1, 2, or 3 above will be denied admission.
- 5. *Fellowships:* Award of a fellowship will be based on the criteria required by the sponsor agency (including the graduate school) on a competitive basis.

### **Requirements for the Master of Science in Electrical Engineering**

#### **General Requirements Applicable to Thesis, Thesis Substitute, and Non-Thesis Degrees**

1. Each degree plan must have courses in at least four different areas of specialization, called Technical Areas. EE has nine such areas. Please see the catalog to determine which Technical Area a course is assigned to.
  1. Digital and Microprocessor/Controller Systems:  
 Digital signal processors, embedded microcontrollers, Microprocessors, Advanced microprocessor systems.
  2. Solid-State Devices, Circuits and Systems:  
 Semiconductor Theory, Microwave Devices and Circuits, Analog Electronics.
  3. Systems, Controls and Automated Manufacturing:  
 Systems, Controls, Manufacturing, Discrete Event Control, Neural and Fuzzy Control, Nonlinear Modern Control, Biomedical Signal Processing and Instrumentation
  4. Electromagnetic Fields and Applications:  
 Remote Sensing, Electromagnetic Fields, Propagation, Scattering, Radiation, and Microwave Systems.
  5. Digital Signal and Image Processing:  
 Vision Systems, Neural Networks, Statistical Signal Processing, Nonlinear Image Processing, Virtual Prototyping, and Virtual Environments.
  6. Telecommunications and Information Systems:  
 Information Transmission and Communication Systems
  7. Power Systems and Industrial Power Electronics:  
 Efficient Operation, Generation, Transmission, Distribution, Deregulation; Power Electronics Engineering.
  8. Optical Devices and Systems:  
 Optics Electro-optics, Diffractive Optics, Nonlinear Optics, and Lasers.
  9. Nanotechnology and MEMS – Materials and Devices  
 Quantum Electronic Devices, Semiconductor Surfaces and Interfaces, Single Electron Devices, Sensors and Detectors, Carbon Nanotube Devices, Noise and Reliability in Nanoelectronic Devices, Micro-actuators, RF MEMS, Polymer Electronics, and Nanophotonics

2. The maximum combined number of transfer and non-UTA Electrical Engineering credits is nine (9) hours. Only graduate level courses in Engineering, Math, and Physics may be used. The grade earned must be a B or higher. Courses taken outside the EE department are considered as a single Technical Area (of the four Technical Areas required for the MSEE degree).
3. The EE course work GPA must be 3.0 or greater. The overall graduate GPA must be 3.0 or greater.

Thesis Degree Requirements

1. Minimum total degree requirement: 30 hours (minimum 24 course hours plus EE 5698).
2. The student must orally defend the thesis before the Supervising Committee. The defense is documented as the Final Master's Examination. The Supervising Committee will consist of three faculty, one of whom may be outside the EE Department.
3. EE 5391 (Advanced Study in EE) may not be used on a thesis degree plan.

Thesis Substitute Degree Requirements

1. Minimum total degree requirement: 33 hours (30 course hours plus EE 5392).
2. The student must present the project results to the EE Faculty. The project presentation is documented as the Final Master's Examination. A minimum of three faculty must serve as project examiners.
3. EE 5391 (Advanced Study in EE) may not be used on a thesis-substitute degree plan.

Non-Thesis Degree Requirements

1. Minimum degree requirement: 36 course hours
2. Fulfillment of the requirement of the Final Master's Exam in Electrical Engineering for MSEE non-thesis degree candidates:
  - The purpose of the Master's Final Exam is to demonstrate a comprehensive knowledge of at least three of the major areas of study in Electrical Engineering.
  - This will be demonstrated by earning a GPA of 3.3 or better in three Technical Proficiency Courses or their equivalents (one each from at least three areas). **The courses used should be completed prior to the final semester.**
  - The examination committee of record will consist of the Graduate Advisor (chairman), Graduate Studies Committee Chairman, and Associate Chairman of the EE Department.
3. EE 5391 (Advanced Study in EE) may be used once on a non-thesis degree plan.

**Technical Proficiency Courses  
(At least three of the areas below must be covered)**

Technical Area	Technical Proficiency Courses
1. Digital and Microprocessor/Controller Systems	EE 5313 – Microprocessor Systems Approved Substitution: EE _____
2. Solid State Devices, Circuits and Systems	EE 5305 – Advanced Electronics EE 5310 – Digital VLSI Design EE 5340 – Semiconductor Device Theory EE 5341 – Fundamentals for Semiconductor Devices Approved Substitution: EE _____
3. Systems, Controls and Automated Manufacturing	EE 5307 – Linear Control Systems Theory EE 5320 – Control System Design EE 5328 – Instrumentation and Measurement Approved Substitution: EE _____
4. Electromagnetic Fields and Applications	EE 5306 – Electromagnetic Theory EE 5331 – Microwave Systems Engineering Approved Substitution: EE _____
5. Digital Signal and Image Processing	EE 5302 – Random Signals and Noise EE 5350 – Digital Signal Processing EE 5356 – Digital Image Processing Approved Substitution: EE _____

6. Telecommunications and Information Systems	EE 5360 – Data Communication Engineering EE 5361 – Fundamentals of Telecommunications Systems EE 5362 – Digital Communications Approved Substitution: EE _____
7. Power Systems and Industrial Power Electronics	EE 5308 – Power System Modeling and Analysis EE 5371 – Power System Transmission I Approved Substitution: EE _____
8. Optical Devices and Systems	EE 5380 – Principals of Photonics and Optical Engineering EE 5386 – Integrated Optics Approved Substitution: EE _____
9. Nanotechnology and MEMS – Materials and Devices	EE 5343 – Silicon IC Fabrication Technology EE 5344 – Introduction to MEMS EE 5381 – Foundations in Semiconductors Approved Substitution: EE _____

### **Requirements for the Ph.D. in Electrical Engineering**

The Ph.D. is a degree with emphasis on research. Requirements for the doctoral degree are described in detail in the UTA Graduate Catalog section on Degree Offerings/Requirements. Permission to continue beyond the master's degree will be based on the grade point average and GRE scores as described above. Approval to continue in the doctoral program is given by satisfactory completion of the following procedure:

- 1) Earning at least a 3.5 GPA in four of the faculty-approved list of Technical Proficiency Courses taken from four different areas,
- 2) Obtaining the approval of a dissertation adviser, and
- 3) Passing the Diagnostic Examination. This exam will be over the four Technical Proficiency Courses.

The course requirements for the Diagnostic Examination should be completed during the MS degree or during the first 30 graduate hours required for entrance into the Ph.D. program. If the student is required to take some of the Technical Proficiency Courses in order to take the Diagnostic Exam, these hours will be in addition to the required advanced level course specified later.

This procedure must be completed within the first year of coursework toward the Ph.D. A student not having attempted the Diagnostic Examination by this time will be allowed one more opportunity to take the examination during the next full semester.

The program of work is expected to include a **minimum** of 18 semester hours of advanced graduate level coursework beyond the master's degree and sufficient dissertation semester hours as required to complete the dissertation. These courses may include graduate level mathematics, science, or engineering relevant to the student's dissertation research program, but only with approval of the graduate advisor.

Status as a doctoral candidate is assigned for students who have passed an oral Comprehensive Examination (a comprehensive dissertation proposal) and submitted a Final Program of Work. The comprehensive Examination will be required by the time the student has completed the required course work. If the student fails the examination, he may be given one more chance to pass it no later than during the following semester. Upon completion of the Comprehensive Examination, the candidate should enroll in the dissertation course (EE 6399, EE 6699, or EE 6999) continuously until defense of the dissertation. The last semester the student must be enrolled in EE 6999. This ordinarily requires approximately 30 semester hours of dissertation credit.

### **Continuation**

The Electrical Engineering Graduate Program, in fulfillment of its responsibility to graduate highly qualified engineers, has established certain policies and procedures. In addition to the requirements of the Graduate School listed elsewhere, to continue in the program each electrical engineering graduate student must maintain at least a B (3.0) GPA in all electrical engineering coursework and at least a B (3.0) GPA in all coursework for M.S. students. A student working toward a Ph.D. must maintain a 3.5 GPA in all electrical engineering coursework and at least a 3.5 GPA in all coursework.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements. A grade of X cannot be changed by enrolling again in the same course. At the discretion of the instructor, a final grade can be assigned through a change of grade form.

Three-hour thesis courses and three- and six-hour research and dissertation courses are graded R/F/W only. The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six-hour thesis courses and nine-hour dissertation courses.

### **Undergraduate Requirements to Qualify a Non-BSEE Graduate for the EE Graduate Program**

The purpose of this qualifying procedure is to prepare a student holding a BS degree in a field closely related to Electrical Engineering to a level commensurate with the BSEE in order to enter the EE Graduate program. This can apply to students with the BS in other engineering programs, Engineering Physics, and possibly other science majors. These requirements go beyond fulfilling the prerequisite for desired graduate courses and are intended to qualify the student with a broad background in the undergraduate EE curriculum.

A student may qualify for entering the MSEE program from a background other than the BSEE by taking a sequence of courses approved by the Graduate Advisor. The following standards apply:

1. A grade of B or better must be received in each course taken.
2. The course may be waived by scoring in the upper 30% of the class in the final (comprehensive) exam for the course.
3. The course may be waived by establishing that a grade of B or better has been obtained in equivalent course or courses.
4. Earning a grade of B or better in a closely related EE graduate level course.

A student from a background other than the BSEE should show competence in the following thirteen course areas. A student with a BS in another engineering discipline can usually qualify by taking from 4 to 10 of these courses. A student from a science background may need to take the majority of these courses.

- |   |   |
|---|---|
| 1. EE 1347 Computer Solution of Electrical Engineering Problems | 8. EE 3317 Linear Systems                             |
| 2. EE 2307 Electromagnetics I                                   | 9. EE 3330 Probability and Random Signals             |
| 3. EE 2315 Circuit Analysis I                                   | 10. EE 3341 Digital Circuit Design                    |
| 4. EE 2446 Circuit Analysis II                                  | 11. EE 3444 Electronics II                            |
| 5. EE 3302 Fundamentals of Power Systems                        | 12. EE 4314 Control Systems                           |
| 6. EE 3308 Electromagnetics II                                  | 13. EE 4330 Fundamentals of Telecommunication Systems |
| 7. EE 3310 Microprocessors                                      |   |

### **Degreed Undergraduate (DUG) Enrollment Guidelines**

Applicants to the Master's program may be allowed to take undergraduate electrical engineering courses as a Degreed Undergraduate if application to the UTA Graduate Program in Electrical Engineering has been made and if the Electrical Engineering Advising Office has been provided with the following information:

1. A copy of all transcripts for the junior and senior years of course work.
2. A letter of intent indicating the reason for enrolling in courses as a Degreed Undergraduate. (Form available in EE Advising Office).

The student must be in one of the following three categories:

1. Have a GPA that is too low to allow admission into the Graduate Program and wish to take junior or senior EE courses to raise the GPA.
2. Have a degree in physics or another branch of engineering (NOT engineering technology) and need to take required undergraduate electrical engineering courses to meet the background requirements necessary for admission to the Electrical Engineering Graduate Program.
3. Be admissible to the Graduate Program but have missed the application deadline for the semester in which enrollment is desired. The student could then be allowed to take courses for one semester in order to complete the application procedure.

No student will be allowed to take Graduate courses to be used toward a graduate degree as a Degreed Undergraduate unless she/he has acceptable GRE scores and an undergraduate Grade Point Average 3.25 or above for the junior and senior years.

Degreed Undergraduates will be allowed to take courses only as long as they are making reasonable progress toward their goals as listed above. Therefore, students who make grades below B in such courses may be denied further enrollment. A cumulative GPA of 3.25 must be maintained for all Degreed Undergraduate courses taken.

### **Required Course Load for Graduate Teaching Assistants/Associates and Graduate Research Assistants/Associates**

1. During the fall and spring semesters, all students enrolled in the master's program in Electrical Engineering who are employed in the Electrical Engineering Department as Graduate Teaching Assistants or Graduate Research Assistants are required to enroll in 9 semester hours. At least 6 semester hours are required in the summer semester.
2. During the fall and spring semesters, all students enrolled in the doctoral program in Electrical Engineering (with a master's degree completed) who are employed in the Electrical Engineering Department as Graduate Teaching Assistants or Graduate Research Assistants are required to enroll in at least 9 semester hours. At least 6 semester hours are required in the summer semester.
3. Doctoral students who have passed the Diagnostic Exam are eligible to enroll for dissertation credit. Once a student has enrolled in the dissertation course, continuous enrollment is required each fall and spring semester. Enrollment in EE 6999 is required in the graduating semester.

### **The Electrical Engineering Faculty and Major Research Interests**

#### **Digital and Microprocessor/Embedded Controller Systems**

- DANIEL ENGELS, Ph.D., MIT, 2000. (817-272-1058) Radio frequency identification systems and applications, wireless mobile, ad hoc and sensor networks, advanced identification and sensing technologies applied to healthcare, and embedded systems. dengels@uta.edu
- BABAK FAHIMI, Ph.D., Texas A&M, 1999. (817-272-2667) Power electronics, digital control of drivers, microscopic energy conversion. fahimi@uta.edu
- GEORGE V. KONDRASKE, Ph.D., UTA and UTSWMC, 1982. (817-272-3473) General systems performance theory; human performance modeling and measurement; task characterization; performance-related issues associated with any type of system; cybernetics; virtual reality; sensor development; and microprocessor-based instrumentation. kondraske@uta.edu
- WEI-JEN LEE, Ph.D., UTA, 1985. (817-272-5046) Power system transient stability analysis; power system dynamic stability analysis and control; power system load flow analysis; power system operations; numerical methods in power system simulations; low voltage surge protection; power electronics. wlee@uta.edu
- BERNARD SVIHEL, M.S., MIT, 1963. (817-272-3329) Telecommunications, electro-magnetics, control systems, digital systems. svihel@uta.edu

#### **Solid State Devices: Circuits & Systems**

- RONALD L. CARTER, Ph.D., Michigan St., 1971. (817-272-3466) Development of device models for use in computer-aided design of integrated circuits, simulation and characterization of solid state devices, silicon and heterojunction bipolar transistors, step-recovery and PIN diodes, electronics manufacturing, statistical process control and quality management. ronc@uta.edu
- ZEYNEP CELIK-BUTLER, Ph.D., Rochester, 1987. (817-272-1309) Measurements, analysis and modeling of noise in advanced electronic devices, semiconductor device reliability, microelectromechanical systems (MEMS), infrared microsensors, electronic devices on flexible substrates, nanoelectronic transport, superconducting devices. zbutler@uta.edu
- JUNG-CHIH CHIAO, Ph.D. Caltech, 1995. (817-272-1337) MEMS (microelectromechanical system) RF and optical devices (RF MEMS and MOEM), nanofabrication and applications, wavelength-division-multiplexing (WDM) optical components and networking, monolithic microwave/millimeterwave integrated-circuit (MMIC) components and antennas, and quasi-optical systems and sensors. jchiao@uta.edu
- W. ALAN DAVIS, Ph.D., Michigan, 1971. (817-272-3495) Microwave and RF circuit component design, microwave semiconductor device modeling. adavis@uta.edu

- SUNGYONG JUNG, Ph.D., Georgia Tech, 2002. (817-272-1338) Analog and mixed signal integrated circuit design, high-speed transceiver circuit design for telecommunication, systems-on-chip implementation, modeling of high speed circuit parasitics, digital signal processing. jung@uta.edu
- WILEY KIRK, Ph.D., SUNY Stony Brook, 1970. (817-272-5632) Nanoscale science and technology; quantum electronic devices; semiconductor devices and materials; molecular beam epitaxy and semiconductor processing. kirk@uta.edu
- ENJUN XIAO, Ph.D., Central Florida, 2003. (817-272-2351) RF integrated circuit design and reliability for wireless communications; analog, digital and mixed signal circuit and system design. exiao@uta.edu

#### **Systems, Controls, and Automated Manufacturing**

- GEORGE V. KONDRASKE, Ph.D., UTA and UTSWMC, 1982. (817-272-3473) General systems performance theory; human performance modeling and measurement; task characterization; performance-related issues associated with any type of system; cybernetics; virtual reality; sensor development; and microprocessor-based instrumentation. kondraske@uta.edu
- FRANK L. LEWIS, Ph.D., Georgia Tech, 1981, IEEE Fellow. (817-272-5972) System modeling and control; robotics and nonlinear process control; neural networks and fuzzy logic systems in feedback control; discrete event manufacturing controllers; robust and adaptive systems. lewis@uta.edu
- QILIAN LIANG, Ph.D., USC, 2000. (817-232-1339) Wireless communications and networking. liang@uta.edu.
- DAN POPA, Ph.D., Rensselaer Polytechnic Inst., 1998. (817-272-3342) Robotics and control systems, micro technology and MEMS. popa@uta.edu
- HARRY STEPHANOU, Ph.D., Purdue, 1976. (817-272-5903) MEMS, control systems, automated manufacturing. stephanou@uta.edu
- KAI-SHING YEUNG, Dr.-Ing., Karlsruhe, 1977. (817-272-3467) Nonlinear control; robust control; systems theory; signal processing. yeung@uta.edu

#### **Electromagnetic Fields and Applications**

- KAMBIZ ALAVI, Ph.D., MIT, 1981. (817-272-5633) Molecular Beam Epitaxy (MBE) of compound semiconductors, physics and applications of heterostructures, multiple quantum wells and superlattices for optoelectronic and electronic devices, magneto-optics; nonlinear optics. alavi@uta.edu
- JONATHAN W. BREDOW, Ph.D., Kansas, 1989. (817-272-3497) Remote sensing, radar, microwave circuits, antennas, electromagnetics, digital signal processing, digital systems. jbredow@uta.edu
- MINGYU LU, Ph.D., Illinois at Urbana-Champaign. (817-272-0709) Computational electromagnetics, fast algorithms, antenna design, numerical analysis. mingyulu@uta.edu
- SAIBUN TJUATJA, Ph.D., UTA, 1992. (817-272-3974) Remote sensing of the environment; wave scattering and emission from random media; parametric retrieval using remotely sensed data; wireless communications; numerical techniques for electromagnetics. tjuatja@uta.edu
- MICHAEL VASILYEV, Ph.D. Northwestern, 1999. (817-272-1224) Quantum and nonlinear optics, quantum electronics, optical communications, electromagnetics, nanophotonics. vasilyev@uta.edu

#### **Digital Signal and Image Processing**

- VENKAT DEVARAJAN, Ph.D., UTA, 1979. (817-272-3485) Digital photogrammetry, computer vision and image processing. venkat@uta.edu
- MICHAEL T. MANRY, Ph.D., UT Austin, 1976. (817-272-3483) Neural networks, image processing, digital signal processing, parameter estimation, and pattern recognition. manry@uta.edu
- SOONTORN ORAINTARA, Ph.D., Boston, 2000. (817-272-3482) Wavelets, filter banks, digital signal processing, image/video/audio processing and compression, low-powered transforms and signal processing. oraintar@uta.edu
- K. R. RAO, Ph.D., New Mexico, 1966. (817-272-3478) Digital image/video/audio compression and coding for transmission and storage based on international standards (ITU, ISO, IEC). Multimedia, video indexing & retrieval. rao@uta.edu
- ZHOU WANG, Ph.D., UT Austin, 2001. (817-272-5024) Digital and biomedical signal and image processing, multimedia communications, computer vision. zhouwang@uta.edu

#### **Telecommunications and Information Systems**

- JONATHAN W. BREDOW, Ph.D., Kansas, 1989. (817-272-3497) Remote sensing, radar, microwave circuits, antennas, electromagnetics, digital signal processing, digital systems. jbredow@uta.edu
- R. STEPHEN GIBBS, Ph.D. UT Dallas, 2003 (817-272-3470) Digital and analog communications and systems. sgibbs@uta.edu.
- QILIAN LIANG, Ph.D., USC, 2000. (817-272-1339) Wireless communications, communication systems and communication theory, wireless networks, ad hoc networks, signal processing for communications, multimedia network traffic modeling and classification. liang@uta.edu

- SOONTORN ORAINTARA, Ph.D., Boston, 2000. (817-272-3482) Wavelets, filter banks, digital signal processing, image/video/audio processing and compression, low-powered transforms and signal processing. oraintar@uta.edu
- VASANT K. PRABHU, D.Sc., MIT, 1963, IEEE Fellow. (817-272-2552) Telecommunications systems, digital and analog communications, communication theory, error correcting codes, simulation of communications systems, microwave propagation and transmission, point-to-point radio transmission, interference analysis of communications systems, spread spectrum communications, cellular radio communications, light wave communications, satellite communications, network theory, optical communications, personal communications systems, digital signal processing. prabhu@uta.edu
- SAIBUN TJUATJA, Ph.D., UTA, 1992. (817-272-3974) Remote sensing of the environment; wave scattering and emission from random media; parametric retrieval using remotely sensed data; wireless communications; numerical techniques for electromagnetics. tjuatja@uta.edu

### **Power Systems and Industrial Power Electronics**

- WILLIAM E. DILLON, Ph.D., UTA, 1972. (817-272-5720) Power electronics; space power applications; high voltage techniques; conventional power system analysis; computer simulation of electrical components and systems. dillon@uta.edu
- BABAK FAHIMI, Ph.D., Texas A&M, 1999. (817-272-2667) Power electronics, digital control of drivers, microscopic energy conversion. fahimi@uta.edu
- BEI GOU, Ph.D., Texas A&M, 2000. (817-272-5049) Electric power system analysis, control, generation, power quality and power marketing. bgou@uta.edu
- RASOOL KENARANGUI, Ph.D., Iowa State, 1980. (817-272-3423) Power systems analysis and operation. kenarang@uta.edu
- WEI-JEN LEE, Ph.D., UTA, 1985. (817-272-5046) Power system transient stability analysis; power system dynamic stability analysis and control; power system load flow analysis; power system operations; numerical methods in power system simulations; low voltage surge protection; power electronics. wlee@uta.edu
- RAYMOND R. SHOULTS, Ph.D., UTA, 1974. (817-272-3472) Advanced computer methods for power system engineering; computer simulation of power system planning; analysis of large-scale networks; optimization in power system analysis; rapid and conventional power flow techniques; reactive power flow analysis; power system operation and control; advanced automatic generation control strategies and simulation; industrial short-circuit calculations for breaker application; reliability methods in power system analysis. shoults@uta.edu

### **Optical Devices and Systems**

- KAMBIZ ALAVI, Ph.D., MIT, 1981. (817-272-5633) Molecular Beam Epitaxy (MBE) of compound semiconductors, physics and applications of heterostructures, multiple quantum wells and superlattices for optoelectronic and electronic devices, magneto-optics; nonlinear optics. alavi@uta.edu
- DONALD P. BUTLER, Ph.D., Rochester, 1986. (817-272-1305) Microelectromechanical devices, micromachined uncooled infrared detectors, semiconductor and superconductor devices and materials, thin film deposition. dbutler@uta.edu
- JUNG-CHIH CHIAO, Ph.D. Caltech, 1995. (817-272-1337) MEMS (microelectromechanical system) RF and optical devices (RF MEMS and MOEM), nanofabrication and applications, wavelength-division-multiplexing (WDM) optical components and networking, monolithic microwave/millimeterwave integrated-circuit (MMIC) components and antennas, and quasi-optical systems and sensors. jchiao@uta.edu
- NIKOLAI STELMAKH, Ph.D. Ioffe Physico-Technical Research Institute, 1989. (817-272-5176) High-power and ultra-fast semiconductor lasers, optical system design, planar light-wave circuits design and fabrication. nikolais@uta.edu
- MICHAEL VASILYEV, Ph.D. Northwestern, 1999. (817-272-1224) Nonlinear, quantum and ultra-fast optics, optical systems & networks, photonic devices. vasilyev@uta.edu
- WEIDONG ZHOU, Ph.D., Michigan, 2001. (817-272-1227) Photonics and optoelectronic materials and devices; photonic crystal materials, devices and photonic integrated circuits; optical interconnect and system on a chip; nanofabrication techniques and applications. wzhou@uta.edu

### **Nanotechnology and MEMS: Materials & Devices**

- KAMBIZ ALAVI, Ph.D., MIT, 1981. (817-272-5633) Molecular Beam Epitaxy (MBE) of compound semiconductors, physics and applications of heterostructures, multiple quantum wells and superlattices for optoelectronic and electronic devices, magneto-optics; nonlinear optics. alavi@uta.edu

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