

COLLEGE OF ENGINEERING

MECHANICAL ENGINEERING DEPARTMENT

Graduate Program Opportunities at U of A

Dr. Joseph J. Rencis, P.E.
Professor and Head

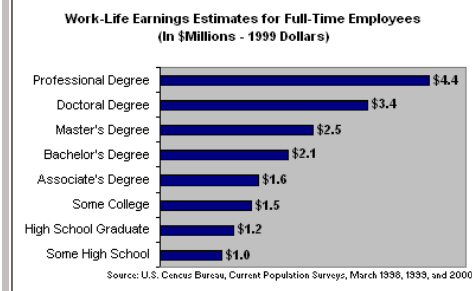
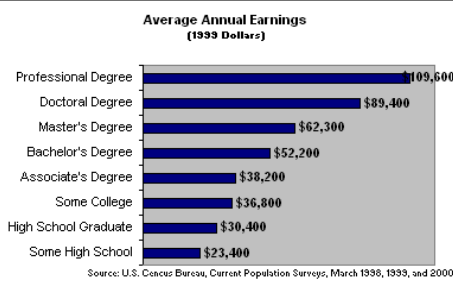
Why Attend Graduate School?

- Career
 - Require Advanced Degrees
 - College and University Teaching
 - Research Labs
 - Dentistry, Law and Medicine
 - Advancement in Many Companies
- Personal
 - Specialize in an Area that you Like and Feel is Important
 - Must have a good reason to attend graduate school!
 - Being jobless is not a good reason.



Does the Time to go to Graduate School Pay Off?

- More Education Yields Higher
 - Salary per Year
 - Income over Lifetime



Does the Time to go to Graduate School Pay Off?

- Highly Competitive Compared to Other Professions

ME Median Salary	
Degree	Salary
Ph.D.	\$103,000
M.S.	\$95,000
Dual B.S.	\$80,000
B.S.	\$80,000

In past, Dual B.S. higher than B.S.
<http://www.abbott-langer.com/asme.html>

How does your profession compare?*


Physician	\$144,363
Lawyer	\$89,964
Engineer	\$73,002
Veterinarian	\$63,021
Account executives (sales)	\$55,041
Architects	\$52,539
Staff nurse	\$45,558
Insurance agent	\$35,990
Drivers (material)	\$35,453
Ranch manager	\$31,606
Cashiers	\$16,528


* median salary data listed in 2002
 Source: Salary.com






UA & COE Overview

- University of Arkansas
 - 17,900 Students – All-time High
 - 6 Colleges
- College of Engineering
 - 7 Departments – All B.S. Engineering Programs are Accredited
 - Biological Systems & Agriculture
 - Chemical
 - Civil & Environmental
 - Computer Science and Computer
 - Electrical
 - Industrial
 - Mechanical
 - 2,100 Students
 - 1,600 Undergraduates
 - 500 Graduate – M.S. & Ph.D. Programs












People

- 332 Undergraduate Students
 - 116 Freshmen in Fall 2006
 - Off-site Program at Fort Smith
 - Junior-Senior Year
 - 20 Students
- 45 Graduate Students
 - 30 M.S. (w/ microElectronics Photonics & Space Planetary Sciences)
 - 15 Ph.D. (w/ microEP & Space Planetary Sciences)
 - Financial Support – Discuss Opportunities Later
 - All but 2 graduate students are on department support.
 - The 2 students are new.







People

- Faculty
 - 18
 - 1 to be Added Fall 2007
- 5 Office Staff
- 2 Technical Staff



Office Staff



Priscilla Griffin
Office Manager



Jessica Prater
Undergraduate & Graduate Secretary



Melissa Longmore
Accountant



Erica Frazier
Receptionist



Debbie Haynes
Receptionist



Technical Staff



Ben Fleming
Machinist



David Ray
Computer/Electronics



ME Graduate Application Contacts



Dr. Rick Couvillion
Graduate Program Coordinator
V-mail: 479-575-4155
E-mail: rjc@uark.edu



Jessica Prater
Graduate Program Secretary
V-mail: 479-575-2640
E-mail: japrater@uark.edu



M.S. in Mechanical Engineering

- *Thesis Option*
 - Typically 2 Years to Complete
 - 30 Semester Hours
 - 6 Hours Thesis
 - 6 Hours Math Required
 - Math and/or ME Math Based Courses
 - At Least 12 Hours ME Courses 5000 or Above
 - Required for GTAs and RAs



M.S. in Mechanical Engineering

- *Non-Thesis Option*
 - Typically 1 ½ - 2 Years to Complete
 - 33 Semester Hours
 - 6 Hours Math Required
 - Math and/or ME Math Based Courses
 - At Least 18 Hours ME Courses 5000 or Above
 - At Least 21 Hours ME Courses
 - Maximum of 6 Hours & No Less than 3 Hours Special Projects



Admission Requirement to M.S. in Mechanical Engineering

- 2.7 GPA or 3.0 GPA Last 60 Hours for ABET Accredited B.S. ME Degree or Equivalent
- May be Deficiencies for non-Mechanical Engineers
- GRE Scores Helpful for Financial Aid
- Helpful for Marginal Applications
 - GRE Scores
 - Passing FE Exam



Admitting

GRE





Ph.D. in Mechanical Engineering

- Common to Have M.S. Degree
- Typical Time Duration
 - 3-3.5 Years after M.S.
 - 4.5-5.5 after B.S.
- 54 Hours Coursework Beyond B.S. (Says you could skip M.S. w/ B.S. ME)
- 24 Hours Dissertation (6 Hours from M.S.)
- Future Trend (Not Approved)
 - 48 Hours Coursework
 - 30 Hours Dissertation



Admission Requirements to Ph.D. in Mechanical Engineering

- 3.0 GPA or 3.2 GPA Last 60 Hours whether Pursuing B.S. ABET Accredited ME Degree or M.S. degree, or Equivalent
- May be Deficiencies for non-Mechanical Engineers
- GRE Scores Helpful for Financial Aid
- Helpful for Marginal Applications
 - GRE Scores 
 - Passing FE Exam 
- Someone Pursuing non-ME B.S. that is Applying to Ph.D. Program, may have be Admitted to M.S. Program



Web Sites



<http://www.meeg.uark.edu/>

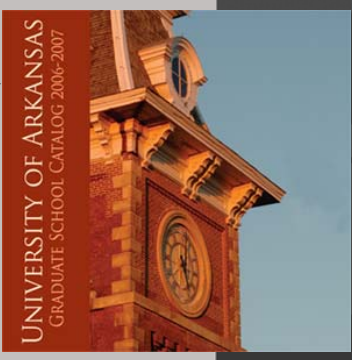


<http://www.uark.edu/depts/gradinfo/>



Application Material

- 2006-07 Catalog: <http://catalogofstudies.uark.edu/1518.htm>
- Application Form: <http://www.uark.edu/depts/gradinfo/forms/student/appl-admission.pdf>
- Application Fee
 - \$40 Domestic Applicants
 - \$50 International Applicants
- Two Official Transcripts per University Attended
- Statement of Interest
- 3 Letters of Recommendation
- Application for Assistantship
- GRE Scores Recommended for Financial Aid
- Deadlines
 - Fall Semester August 1st
 - Spring Semester December 1st
 - Summer Semester March 1st
 - Best to Submit Earlier for TA and RA Positions!
- Preferred Deadlines for Financial Aid
 - Fall Semester January 1st
 - Spring Semester October 1st



Estimated Cost per Semester

2006-07 Academic Year

- Arkansas Resident – Based on 12 credit hours per semester.

– Tuition	\$3,240 (\$270/hr)
– University Fees	\$ 346
– <u>College Fees</u>	<u>\$ 350</u>
– Subtotal	\$3,936
– <u>Room and Board</u>	<u>\$3,270 (on-campus)</u>
– Total	\$7,206
- + Books and Supplies
- Board includes Unlimited Meal Plan



Estimated Cost per Semester

2006-07 Academic Year

- Non-Resident – Based on 12 credit hours per semester.

– Tuition	\$7,665 (\$639/hr)
– University Fees	\$ 346
– <u>College Fees</u>	<u>\$ 350</u>
– Subtotal	\$8,361
– <u>Room and Board</u>	<u>\$3,270 (on-campus)</u>
– Total	\$11,631



- + Books and Supplies
- Board includes Unlimited Meal Plan



Financial Support

- Graduate Teaching Assistantships (GTAs)
 - Merit Based
 - Foreign Students are Eligible
 - Given out by Department Head
 - Time Duration
 - 9 Month Academic Year
 - Some Summer GTAs at Reduced Tuition Waiver & Stipend
 - Tuition Waiver – 9 Hours per Semester
 - Fees Paid by all TAs at \$70 per Semester Hour
 - Stipend
 - M.S. \$1,275 per Month
 - Ph.D. \$1,500 per Month
 - Passed Ph.D. Qualifying Exam \$1,725 per Month
 - Responsibilities
 - 20 Hours per Week
 - Assigned to Undergraduate Course(s)
 - Grading, Leading Drill Sessions, Lab, Proctor Exams, etc.
 - 8-9.5 GTAs per Semester
 - M.S. Students on GTA are Required to do Thesis Option
 - Deadline: Rolling



Financial Support

- Research Assistantships (RAs)
 - Awarded by Faculty Member
 - Foreign Students are Eligible
 - Talk to Faculty Regarding Support
 - Time Duration Varies w/ Research Grants
 - Tuition Wavier – 9 Hours per Semester
 - Fees May Have to be Paid at \$70 per Semester Hour
 - \$1,275 – 1,725 per Month Stipend
 - Responsibilities
 - Focused on Research Grant Area
 - 20 Hours per Week
 - M.S. Students on RA are Required to do Thesis Option



Financial Support

- Distinguished Doctoral Fellowships (DDF)
 - Given out by Graduate School
 - Separate Application Required
 - U.S. Citizens
 - Stipend
 - \$20,000 per Year Supplement
 - + Base Stipend from GTA/RA
 - Tuition Wavier
 - 4 Years Maximum
 - Must Submit Proposal for NSF Fellowship
 - 3.8 GPA Minimum
 - 1200 Verbal+Quantitative GRE & 5.0 Analytical Writing
 - Nominated by ME Department Head
 - Deadline February 1st



Financial Support





- Doctoral Academy Fellowships (DAF)
 - Given out by Graduate School
 - Separate Application Required
 - Foreign Student Eligible
 - Stipend
 - \$10,000 per Year Supplement
 - + Base Stipend from GTA/RA
 - Tuition Wavier
 - 4 Years Maximum
 - Must Submit Proposal for NSF Fellowship
 - 3.5 GPA Minimum
 - 1100 Verbal+Quantitative GRE & 5.0 Analytical Writing
 - Nominated by ME Department Head
 - No Deadline – Awarded Throughout Year



Apartments Near Campus

January 2006 Rates

- Studio
 - \$300-375 per Month Furnished or Unfurnished
- 1 Bedroom
 - \$425-500 per Month Unfurnished
 - \$500-525 per Month Furnished
- 2 Bedroom
 - \$550 per Month Unfurnished
 - \$550-625 per Month Furnished
- Most Places Require Residents Pay Electric and Water and the Heat is Included



Program & Research Areas

- Program Areas
 - Mechanical Systems
 - Thermal Systems
 - Materials
 - Aerospace
- Research Areas




Faculty Overview


- 18 Full-time
 - 7 Professors
 - 4 Endowed Chairs
 - 2 \$3M Chairs
 - 2 \$1.5M Chairs
 - 6 Associate Professors
 - 4 Assistant Professors
 - 1 Instructor






Mechanical Systems Faculty



Dr. Ing-Chang Jong, P.E.
Mechanics, Dynamic Stability,
Nonlinear Vibrations & Applied
Mathematics
icjong@uark.edu



Dr. Bill Springer, P.E.
Machine Design, Vibrations,
Mechanisms, Structural Dynamics,
Modal Analysis, NDE & Robotics
wts@uark.edu



Mechanical Systems Faculty



Dr. Joe Rencis, P.E.
Mechanics, Finite & Boundary
Elements, Multiscale
Modeling
jjrencis@uark.edu



Dr. Sulin Zhang
Multiscale Methods, Molecular
Dynamics, Nanostructured
Materials & Nano-bio Interfaces
szhang1@uark.edu



Mechanical Systems Faculty



Dr. Bill Schmidt, P.E.
Finite Elements, Solid
Mechanics, Electronic Packaging
& Coating of Cutting Tools
wfs@uark.edu



Dr. Leon West, P.E.
Nuclear Engineering, Vehicle
Dynamics, Robotics, CAD,
Microcontrollers & Nuclear Instruments
west@uark.edu



Thermal Systems Faculty



Dr. Darin Nutter, P.E.
Heat Transfer, Liquid-Vapor Phase
Change, Air-conditioning/Heat Pumps,
Energy Systems & Energy Conservation
dnutter@uark.edu



Dr. Matt Gordon, P.E.
Plasma Sciences, Optical Diagnostic
Methods, Lab-on-Chip
& Electronic Packaging
mhg@uark.edu



Thermal Systems Faculty



Dr. Rick Couvillion, P.E.
Energy Systems, Electronic Cooling &
Geothermal Energy
rjc@uark.edu



Dr. James Davis, P.E.
Fluids, Heat Transfer, CFD, Energy
Systems & Chemical Process Design
jad1@uark.edu



Materials Faculty



Dr. Ajay Malshe
*21st Century Chair of Materials,
Manufacturing and Integrated Systems*
Nanomanufacturing, Surface
Engineering, MEMS & High-density
Microelectronic Packaging
apm2@uark.edu



Dr. Deepak Bhat, P.E.
Giffels Chair
Surface Engineering, Power Metallurgy,
Cutting Tools & Materials Processing
dgbhat@uark.edu

at NSF 2006-07



Materials Faculty



Dr. Steve Tung
Micro and Nano Fluidics, MEMS,
Carbon Nanotubes, Electroactive
Polymer & Space Inflatable Structures
chstung2@uark.edu



Dr. Doug Spearot
Nanoscale Structure-Property Relationships,
Molecular Dynamics, Interface Behavior &
Dislocations and Defects in Materials
dspearot@uark.edu



Materials Faculty




Dr. Ashok Saxena
*21st Century Chair in Material
Science and Engineering*
Fracture Mechanics
asaxena@uark.edu




Dr. Min Zou
Nano-surface-engineering,
Nanomechanics & Nanotribology
mzou@uark.edu






Aerospace Faculty




Dr. Larry Roe, P.E.
Combustion, Fluid Dynamics,
Propulsion & Spacecraft Systems
lar@uark.edu





Dr. Adam Huang
Pico-nano Satellites &
Multi-scale Interactions
phuang@uark.edu



Additional Faculty in Fall 2007



21st Century Chair in Nano Technology



Buildings

- ME Building
 - Academics
 - 30,000 ft²
- Engineering Research Center (ENRC)
 - 2 Miles South of Campus
 - Research
 - 180,000 ft² ENRC
 - 15,500 ft² for ME Research
 - Free Parking
- Key Access for Grad Students 24/7



Research Laboratories

1. Mechanical Behavior of Materials – Dr. Saxena
2. Energy Systems Studies - Drs. Nutter & Couvillion
3. Surface Engineering - Dr. Bhat
4. Combustion - Dr. Roe
5. Southwest Radiation Calibration Center - Dr. West
6. Nano-surface-engineering & Nanomechanics - Dr. Zou
7. Micro, Nano & Bio - Dr. Tung
8. Materials and Manufacturing Research - Dr. Malshe
9. Multiscale Modeling - Drs. Spearot, Zhang & Rencis
10. Engineered Micro/Nano & Robotic Systems - Dr. Adam Huang



Graduate Student Offices

- All Graduate Students Have an Office
- ME Building
 - All GTAs
 - Some RAs
 - Small Offices: 2-3 Students
 - Large Offices: 6-10 Students
 - Network Computer for Office and/or Individual
- Engineering Research Center (ENRC)
 - RAs
 - Office Vary w/ Lab
 - Network Computer for Office and/or Individual



Computer Classroom & Lab

- in ME Building
- 24/7 Access
- Engineering Software
- Computer Classroom - Networked
 - 28 Computers w/ Flat Panels
 - 1 High End Printers
- Computer Lab - Networked
 - 24 Computers w/ Flat Panels
 - 2 High End Printers
 - 1 Color Printer
 - 2 Scanners
- No Charge for Printing
- Wireless Network on Campus



Computer Classroom



Graduate Student Conference Travel

- Supported by
 - Faculty Member
 - Graduate School
 - Ph.D. Students
 - Presenting Author
 - 1 Conference per Year
 - Up to \$1,000 per Year w/ 10% Matching from Faculty or Department
 - M.S. Students
 - Presenting Author
 - 1 Conference per Year
 - Up to \$500 per Year w/ 10% Matching from Faculty or Department
- Many Graduate Students Attend Multiple Conferences per Year



Annual Social Activities

- Graduate Student Socials
- ASME Fall Picnic
- ASME Holiday Party
- Department Head Holiday Party
- Holiday Pot Luck Lunch
- ASME End of Year Bash - Pig Roast



Engineering Expo: Job Fair

- For Undergraduate & Graduate Students
- Held September & February
- September 2006
 - 84 Companies
 - 52 Looking for MEs
 - <http://career.uark.edu/students/careerfairs.asp#engexpo>
- Full-time, Co-op & Internship Opportunities
 - Graduate Students can Participate in Co-op Program



Who are some employers who hire ME grads?



Who are some employers who hire ME grads?
















Undergraduate Summer Research Opportunities at UA

- Provides Stipend, Travel, Housing, etc.
- Great Opportunity
 - Interested in Research
 - Edge for Admission to Graduate School
- ME Department
 - Focus: Nanomaterials and Nanomechanics
 - <http://comp.uark.edu/~jjrencis/REU/>
 - See Information in Packet
- Microelectronics-Photonics
 - Focus: Micro/Nanotechnology
 - <http://microep.uark.edu/>
- Space and Planetary Sciences
 - Focus: Space and Planetary Sciences
 - <http://spacecenter.uark.edu/97.htm>









ASME World Solar Splash Competition

- Solar/Electrical Boat Competition
- Fayetteville, AR
- June 21-25, 2006
- ME and EE Students
- Collegiate World Champion (1st Overall)
- Awards
 - 1st Sprint Event
 - 2nd Solar Endurance
 - Outstanding Solar System Design



2006-2008 in Fayetteville!

Hosted by U of A
June 20-24, 2007

UA Faculty Advisors



Dr. Bill Springer, ME Dr. Alan Mantooth, EE



Dr. Roy McCann, EE

<http://www.solarsplash.com/>



AIAA Design-Build-Fly Competition



- New This Year
- <http://www.ae.uiuc.edu/aiaadbfi/index.html>
- Advisor Dr. Adam Huang
- Date: 3rd Week of April
- Location: Tuscon, AR



Campus Visit to ME Department

- Contact



Dr. Rick Couvillion
Graduate Program Coordinator
V-mail: 479-575-4155
FAX: 479-575-6982
E-mail: rjc@uark.edu

- Travel Funds Available
- Will Host You for the Day
- Please Schedule 2 Weeks in Advance
- Best Day to Visit
 - Friday Mid-Day to Late Afternoon



Thank You for Listening!



Joe Rencis

V-mail: 479-575-4153

FAX: 479-575-6982

E-mail: jjrencis@uark.edu

