

**ECEN 5843**  
**MICROELECTRONIC FABRICATION**  
**SPRING 2017**

CRN: 21365

Instructor: Weili Zhang Office: ES 312  
Phone: 744-7297 E-mail: weili.zhang@okstate.edu

Class Hours: TR 9:00 – 10:15 am

Office Hours: TR 3:30 – 4:30 pm; or by appointment

Classroom: ATRC 002M, Cleanroom Studio

Website: <http://wezhang.okstate.edu/>

Textbook: Peter V. Zant, Microchip Fabrication, 6<sup>th</sup> edition, 2014, McGraw Hill, ISBN 978-0-07-182101-8

References: Richard C. Jaeger, Introduction to microelectronic fabrication, 2002, Addison-Wesley  
Gary S. May, and Simon M. Sze, Fundamentals of semiconductor fabrication, 2004, John Wiley & Sons  
Marc J. Madou, Fundamentals of microfabrication, 1997, Boca Raton

Course Topics: Evolution of Semiconductor Industry  
Contamination Control & Cleanroom  
Vacuum Systems  
Semiconductor Materials  
Manufacturing Wafers  
Photo Lithography  
Film Deposition  
Etching: Wet Etching, Dry Etching  
Oxidation: Modeling, Wet Oxidation, Dry Oxidation  
Doping: Diffusion, Ion Implantation  
Packaging: Dicing, Bonding  
Formation of Semiconductor Devices and Circuits  
Advanced Lithographic Techniques  
Cutting edge MicroFabrication  
THz Microchips

Grades: Quizzes: 25%  
Laboratory: 30%  
Paper & Presentation: 15%  
Final Examination: 30%  
Scale: 0-59% = F; 60-69% = D; 70-79% = C; 80-89% = B; 90-100% = A  
No student may earn credits for both ECEN5843 and ECEN4010 MicroFabrication

Paper: [Proposal due 2/28](#); [Paper due 4/18](#)  
Everyone needs different topic; First come – first served; Basics, current fabrication process & perspective/actual topics  
~ 10 pages  
Late papers: Subtract 10% per day  
Copy from Internet: 0 points for paper/presentation

Paper Topics: Nanoimprint lithography  
Plasmonic nanolithography  
Immersion lithography  
EUV lithography  
Nanotechnology  
Cutting edge MEMS (Micro Electro-Mechanical Systems)  
Laser microfabrication & micromachining

New copper technology  
 Progress of ion implantation  
 Specific processing innovations  
 Biochips  
 Photonic crystals  
 Plasmonic crystals  
 Metamaterials (negative index materials or left-handed materials)  
 Novel terahertz transmitters/receivers  
 Tri-gate transistors  
 Terahertz transistors  
 Cutting edge laser diodes  
 New superconducting devices  
 GaN wafer and devices  
 Devices & design: RAM, DRAM, ASIC, DSP, microprocessor, etc.  
 Data storage devices  
 Micro sensors  
 Micro robotics  
 New semiconductor/wafer materials

- Presentation:** Oral - 12 minutes (10 min presentation; 2 min questions) or Poster  
 PPT/Multimedia (optional, grade for content)  
 Interview with at least one company (current topics/problems)  
 References (IEEE Format, incl. literatures, websites, and any other external resources)  
 Each presenter gets feedback from audience  
 Copy from Internet: 0 points for paper/presentation
- Quizzes:** Three in-class exams will be given during the semester. They are based on material covered in class and noncomprehensive. The format will vary, some combination of multiple-choices, short problems, short answers, and essay questions might be included. The dates of the three exams are given in the class schedule.
- Final Exam:** [5/05 8:30-10:20 am, ATRC 002M](#)  
 Written exam covering lectures, and presentations
- Laboratory:** Groups at 3-6 students  
 6 Lab projects will be conducted in ATRC cleanroom and chiprooms  
 Everyone fabricates his/her own microchips  
 Grades for each step of fabrication process  
 Unsafe handling of chemicals: 0 points for lab  
 Improper handling of cleanroom equipment: 0 points for lab
- Participation:** Keep up with class discussions, and laboratory projects  
 Bring your textbook to class
- Attendance:** Absent in safety lesson: 0 points for lab  
 Arrive after roll has been taken will be counted absent unless you notify me after class  
 An extra point on your final average by having no absence
- Academic Integrity:** Academic dishonesty (cheating) will not be tolerated. Everything a student submitted must be his/her own work. Anyone suspected of academic dishonesty will be referred to the proper University authority as explained in *Oklahoma State University Student Rights and Responsibilities Governing Student Behavior*. Examples of academic dishonesty include:  
 Soliciting answers from a fellow student during a quiz or examination;  
 Looking or glancing at another student's paper during a quiz or examination;  
 Removing a page or pages from an examination booklet either before, during, or after an examination;  
 Using a programmable calculator during an examination;  
 Modifying or altering a withdrawal slip.
- Disabled Students:** If any member of this class feels that he/she has a disability and needs special accommoda-

tions of any nature whatsoever, I will work with you and the Office of Disabled Student Services, 315 Student Union, to provide reasonable accommodations to ensure that you have a fair opportunity to perform in this class. Please advise me of such disability and the desired accommodations at some point before, during, or immediately after the first scheduled class period.

Deadlines: Copy of student ID and work/course schedule: 1/24  
 Proposal: 2/28  
 Paper: 4/18  
 Final Examination: 5/05 8:30-10:20 am

## CLASS SCHEDULE

DATE	TOPIC	READING ASSIGNMENT
1/17	Introduction	
1/19	Evolution	1-18
1/24	Fabrication Overview; semester schedule due	59-76
1/26	Contamination control	77-114
1/31	Semiconductor materials	19-40
2/02	Manufacturing wafers; Demonstration 1: wafer orientation	41-58
2/07	Photolithography	161-211
2/09	Advanced photolithography	233-268
2/14	Lab safety	
2/16	Quiz 1, ATRC 002M	
2/21	Lab 1: Wafer cleaning I;	
2/23	Lab 1: Wafer cleaning II	
2/28	Demonstration 2: photolithography I; proposal due	223-232
3/02	Demonstration 2: photolithography II	
3/07	Lab 2: Photolithography I	
3/09	Lab 2: Photolithography II	
3/14	Spring Break	
3/16	Spring Break	
3/21	Etching; Lab 3: Plasma Etching	212-223
3/23	Deposition I; Demonstration 3: thermal evaporation	333-351
3/28	Lab 4: Metallization I	
3/30	Lab 4: Metallization II	
4/04	Deposition II; Demonstration 4: E-beam evaporation	299-332
4/06	THz chips; Vacuum systems	351-354
4/11	Quiz 2; Oxidation	131-160
4/13	Doping	269-298
4/18	Lab 5: Oxidation; paper due	
4/20	Lab 6: Dicing	
4/25	Packaging; Demonstration 5: Bonding	465-502
4/27	Formation of microelectronic devices I	417-444
5/02	Formation of microelectronic devices II; Quiz 3	445-450
5/04	Cutting Edge MicroFabrication	
5/05	Final Exam 8:30 – 10:20 am, ATRC 002M	



# OKLAHOMA STATE UNIVERSITY

## SYLLABUS ATTACHMENT

Spring 2017

<http://academicaffairs.okstate.edu>

*YOUR SUCCESS AS A STUDENT IS OUR TOP PRIORITY.*

*THIS INFORMATION IS PROVIDED TO ANSWER QUESTIONS MOST OFTEN ASKED BY STUDENTS.*

### IMPORTANT DATES

Last day to add a class (without instructor permission)	1/24/2017
Last day to drop a course with no grade and 100% refund	1/24/2017
Last day to add a class (requires instructor & advisor permission)	1/27/2017
Last day to drop a course or withdraw from the University with an automatic "W" and receive a partial refund (requires advisor signature)	1/27/2017
Last day to post 6 week grades	2/28/2017
Last day to file diploma application (for name to appear in Spring Commencement program)	4/3/2017
Last day to drop a class or withdraw from the University with an automatic "W"	4/14/2017
Last day to withdraw from all OSU classes with an assigned grade of "W" or "F"	4/28/2017
Pre-Finals week	5/1/2017-5/5/2017
Final examinations	5/8/2017-5/12/2017

*Note: Outreach, Internet, and short courses have unique drop/add and refund deadlines; lookup the specific deadlines for these courses on the Short, Internet, and Outreach Class Schedules page of the Registrar's website <http://registrar.okstate.edu/SIO-Schedule>.*

### Fall Semester Holidays

University Holiday	1/16/2017
Students' Spring Break	3/13/2017-3/17/2017

### DROPPING A COURSE AND WITHDRAWING FROM THE UNIVERSITY

students often confuse these terms.

**Dropping a Course** (or courses) may occur during the first twelve weeks of the semester. This means, however, that you are still enrolled in at least one other OSU course. Exceptions to the deadlines above may only be considered by petition due to documented extraordinary circumstances and committee approval. The Retroactive Drop/Withdraw Petition and the Petition for a Refund of Tuition and Fees forms are available on the Registrar's website <http://registrar.okstate.edu/Forms>.

**Withdrawing** from the university means dropping *all* courses and you *are no longer enrolled for the current semester*. This may occur until the Friday before pre-finals week. The withdrawal process is initiated with your academic advisor. For additional information and dates, go to: <http://academicaffairs.okstate.edu/content/adding-dropping-and-withdrawing-courses>.

### ALERTS AND RESCHEDULING

If the OSU campus officially closes due to inclement weather or other emergencies, alerts are provided to local news media and posted on the OSU website. Missed exams, classes, or assignments may be rescheduled at times outside the normal meeting schedule. If valid, documented circumstances prohibit students from attending the rescheduled classes, instructors should provide reasonable alternative means for makeup.

### SEEK ANSWERS TO YOUR QUESTIONS

The OSU faculty and staff want you to be successful in your educational pursuits. If you have questions or concerns, seek help EARLY. We are here to assist you.

### ACADEMIC INTEGRITY

101 Whitehurst/405-744-5627/<http://academicintegrity.okstate.edu>  
OSU is committed to maintaining the highest standards of integrity and ethical conduct. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and altering academic records) will result in an official academic sanction. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended from the University. You have the right to appeal the charge.

### COPYRIGHT & FAIR USE POLICY OF COURSE MATERIALS

Course materials may not be published, leased, sold to others, or used for any purpose other than appropriate OSU-related individual or group study without the written permission of the faculty member in charge of the course and other copyright holders. This paragraph grants you a limited license giving you access to materials for this course, including PowerPoint slides, audio/video recordings, written, or other materials, for appropriate OSU-related educational use only. Lectures should not be recorded without permission from the faculty member and must not be further disseminated or shared.

### CLASS ATTENDANCE

Class attendance is a critical component of learning; therefore, you are expected to attend and participate fully in all scheduled class meetings. Many instructors consider attendance so essential that your grade may be affected by your absence. *SOME DEPARTMENTS AND PROFESSORS HAVE MANDATORY ATTENDANCE POLICIES*. If no written attendance policy is provided before the last day to add a class without instructor permission, no penalty may be assessed for class absences although you may not be permitted to make up certain in-class activities. If you are required to participate in official university-sponsored activities or military training, you should receive an excused absence unless the written course attendance policy indicates otherwise. If you will be absent from class for sponsored activities, you must provide prior notification of the planned absence to the instructor. You may be required to submit assignments or take examinations before the planned absence.

### PRE-FINALS WEEK POLICY

Final examinations are scheduled at the end of each semester and are preceded by pre-finals week, which begins seven days prior to the first day of finals. During pre-finals week, all normal class activities will continue; however, no assignment, test, or examination accounting for more than 5% of the course grade may be given; and no activity or field trip may be scheduled that conflicts with another class. This excludes makeup and laboratory examinations, out-of-class assignments (or projects) made prior to pre-finals week and independent study courses. No student or campus organization may hold meetings, banquets, receptions, or may sponsor or participate in any activity, program, or related function that requires student participation. For additional information, contact the Office of Academic Affairs, 405-744-5627, 101 Whitehurst.

## **FINAL EXAM OVERLOAD POLICY**

In the event you have three or more final exams scheduled for a single day, you are entitled to arrange with the instructor of the highest numbered course (4 digit course number) or two highest, if you have four finals on one day, to re-schedule that examination(s) at a time and place of mutual convenience during final exam week. If the final exam overload includes a common final exam, the common final exam is excluded from rescheduling unless multiple common exams are scheduled at the same time. You should submit this request in writing, with a copy of your class schedule, at least two weeks prior to the beginning of final exam week. The instructor has one week prior to the beginning of final exam week to arrange a mutually convenient time and place for administration of the final exam. After one week, if an agreement cannot be reached, take the request to the department head.

## **INFORMATION TECHNOLOGY**

**Student Email** - OSU uses your OKSTATE.EDU email address as a primary form of communication. Students are expected to check their OSU email on a frequent and consistent basis to remain informed of their official university business. If you do not use the OSU email system you must redirect your okstate.edu email using the Orange-Key System ([www.okey.okstate.edu](http://www.okey.okstate.edu)). Failure to maintain an accurate email address may result in missed or lost university communications. For email assistance contact the IT Helpdesk at 405-744-HELP (4357).

**Computer Labs** - A complete description of computer labs and hours of operations are available at their website: <https://it.sharepoint.okstate.edu/TechnologySupport/DeskSide/default.aspx>. Lab information is also available by calling the Information Technology Help Desk at 405-744-HELP (4357).

## **OFFICE OF EQUAL OPPORTUNITY**

408 Whitehurst/405-744-9153/<https://1is2many.okstate.edu/>  
OSU is committed to maintaining a learning environment that is free from discriminatory conduct based on race, color, religion, sex, sexual orientation, gender identity, national origin, disability, age or protected veteran status. OSU does not discriminate on the basis of sex in its educational programs and activities. Examples of sexual misconduct and/or sex discrimination include: sexual violence, sexual harassment, sexual assault, domestic and intimate partner violence, stalking, or gender-based discrimination. OSU encourages any student who thinks that he or she may have been a victim of sexual misconduct or sexual discrimination to immediately report the incident to the Title IX Coordinator (405-744-9153) or Deputy Title IX Coordinator (405-744-5470). Students may also report incidents of sexual misconduct or sex discrimination to a faculty or staff member, who is then required by federal law (Title IX) to notify the Title IX or Deputy Title IX Coordinator. If a reporting student would like to keep the details confidential, the student may speak with staff in the Student Counseling Center (405-744-5472) or the University's Victim Advocate (Suzanne Burks: 405-744-5458).

## **OFFICE OF STUDENT DISABILITY SERVICES**

315 Student Union/405-744-7116/<http://sds.okstate.edu/>  
According to the Americans with Disabilities Act, each student with a disability is responsible for notifying the University of his/her disability and requesting accommodations. If you think you have a qualified disability and need special accommodations, you should notify the instructor and request verification of eligibility for accommodations from the Office of Student Disability Services. Please advise the instructor of your disability as soon as possible, and contact Student Disability Services, to ensure timely implementation of appropriate accommodations. Faculty have an obligation to respond when they receive official notice of a disability but are under no obligation to provide retroactive accommodations. To receive services, you must submit appropriate documentation and complete an intake process to verify the existence of a qualified disability and identify reasonable accommodations.

## **STUDENT CONDUCT AND ADMINISTRATION**

315 Student Union/405-744-7716/<http://studentconduct.okstate.edu/>  
By enrolling at Oklahoma State University, you accept responsibility for complying with all University policies and contracts, and for local, state and federal laws on- or off-campus that relate to the University's mission. **The Student Rights and Responsibilities Governing Student Behavior** document explains the standards of behavior expected of you, processes in place for enforcing the rules, and the University's response to violations.

In general, the University expects you to respect the rights of others and authorities, represent yourself truthfully and accurately at all times, respect private and public property, and take responsibility for your own actions and the actions of your guests.

## **EDMON LOW LIBRARY HOURS**

405-744-9775 or 405-744-9741

Sunday

Monday-Thursday

Friday

Saturday

\*For holiday and intersession hours, check

<http://www.library.okstate.edu/services/hours.htm>

[www.library.okstate.edu](http://www.library.okstate.edu)

Text 405-592-4128

Opens at 9:00 AM

Open 24 hours

Closes at 10:00 PM

9:00 AM-10:00 PM

\*Contact the following for information on hours of operation:

Architecture Library 405-744-6047

Curriculum Materials Library 405-744-6310

Veterinary Medicine Library 405-744-6655

## **WHERE TO GO FOR HELP**

### **ACADEMIC RELATED SERVICES**

**Instructor** - If you have questions regarding your class, talk to your instructor. Faculty members usually include their office hours and/or phone number in the class syllabus. If you cannot locate this information, set a time to meet with your instructor by speaking with him/her prior to or immediately following your class session or check with the departmental office on when the instructor may be available.

**Academic Advisor** - All students will benefit by conferring with an advisor on a regular basis. If you do not know your advisor or would like to learn more, talk to the Student Academic Services Director for your college.

### **Bursar Office**

113 Student Union/405-744-5993

<http://bursar.okstate.edu/>

The Bursar Office bills and collects tuition, fees, campus housing, and other university related charges. The Bursar Office also processes and disburses all federal and campus-based funds to students' bursar accounts and refunds any overpayments on students' bursar accounts.

### **Career Services**

360 Student Union/405-744-5253

<http://hireosugrads.com>

Locate your College's Career Consultant on the Career Services website. Use <http://hireosugrads.com> to search for part-time jobs.

### **Concurrent Student Services and Advising**

University College/040 Student Union/405-744-1389

To find out what academic services are available to concurrent students or to schedule your next concurrent advising session, contact Brett Rowh (405-744-1393).

**Foreign Language Placement Test**

206 Gunderson Hall/405-744-9547

<http://languages.okstate.edu>

Students with prior foreign language experience in French, German, or Spanish who take the placement exam and then score a 'B' or higher in either 1225 or a third semester course will get free retroactive credit for the levels below that class for up to 10 credits. Schedule your free test with Nick Howland by emailing: [nick.howland@okstate.edu](mailto:nick.howland@okstate.edu).

**Office of Multicultural Affairs**

240 Student Union/405-744-5481

<http://oma.okstate.edu/>

Academic, career, and personal success programs are available. Student organizations representing diverse communities and annual events are offered.

**Office of the Registrar**

322 Student Union/405-744-6876

<http://registrar.okstate.edu/>

The Office of the Registrar provides services related to the creation and maintenance of student academic records. We are here to assist students with enrollment, official transcript requests, degree and enrollment verification, updating personal information in the Student Information System, graduation, and other services.

**Scholarships & Financial Aid**

119 Student Union/405-744-6604

<http://financialaid.okstate.edu>

Over 80 percent of Oklahoma State University students received scholarships, grants, work, and low-interest loans totaling over \$320 million last year. Contact the Office of Scholarships & Financial Aid to apply for financial aid or to meet with a financial aid counselor.

**Transfer Students Services**

University College/040 Student Union/405-744-1332

Contact: Amy Cole-Smith

This office provides undergraduate transfer students with a seamless transition to OSU by collaborating with various departments on campus, including the Office of Undergraduate Admissions, the LASSO Center, the Office of the Registrar, and Financial Aid.

**University Assessment and Testing**

107 University Assessment and Testing Building/405-744-5958

<http://uat.okstate.edu/>

Campus and national tests as well as testing accommodations are provided.

**Veteran Benefit Services**

322 Student Union/405-744-6343

<http://registrar.okstate.edu/Veteran-Benefit-Services>

This office provides information and assistance in completing the appropriate forms to apply for educational benefits through the U.S. Department of Veterans Affairs and through the State of Oklahoma.

**Veteran Student Academic Affairs**

University College/040 Student Union/405-744-1389

Contact: Rick Hansen

This office works with veteran and military-affiliated students to aid them in their transition from military service to successful careers by ensuring they succeed academically through coordination of support services from both on- and off-campus entities.

**HEALTH RELATED SERVICES****Counseling Psychology Clinic**

107 Public Information Office/405-744-6980

<https://education.okstate.edu/cpsy/clinic>

Faculty and graduate students offer high quality and cost efficient psychological and mental health services to students Monday through Friday.

**University Counseling Services**

320 Student Union/405-744-5458

<http://www.okstate.edu/ucs/>

Services include: personal counseling; the Alcohol & Substance Abuse Center; and, stress management through the Reboot Center.

**University Health Services**

1202 W. Farm Road/405-744-7665

<http://uhs.okstate.edu/>

An allergy clinic, lab services, x-ray, travel clinic, women's clinic and pharmacy are among the services offered at this campus outpatient medical clinic.

**Wellness Department**

405-744-5510

<http://wellness.okstate.edu/>

Intramurals, group fitness and sports clubs are among the many programs and services available through the Wellness Department.

**CAMPUS LIFE RELATED SERVICES****Fraternity & Sorority Affairs**

211J Student Union/405-744-5490

<http://gogreek.okstate.edu/>

For questions and comments about fraternity and sorority organizations, contact Ival Gregory at [ival.gregory@okstate.edu](mailto:ival.gregory@okstate.edu).

**Housing & Residential Life**

100 Iba Hall/405-744-5592

<http://reslife.okstate.edu>

For questions and comments about housing and residential life, contact the Housing administration office.

**Leadership and Campus Life**

211 Student Union/405-744-5488

<http://lcl.okstate.edu>

Get involved through student organizations; the Center for Ethical Leadership; International Students & Scholars; Non-traditional Student Services; and Parent & Family Relations.

**Service-Learning Volunteer Center**

211G Student Union/405-744-5145

<http://volunteer.okstate.edu/>

Find volunteer opportunities and earn the recognition C.O.R.D. to wear at graduation.

**University Dining Services**

076 Student Union/405-744-4424

<http://dining.okstate.edu/>

For questions and comments about meal plans or university dining operations, contact University Dining Services.

**ACADEMIC SUPPORT RESOURCES AND TUTORING****Learning and Student Success Opportunity (LASSO) Tutoring Center**

021 Classroom Building/405-744-3309

<https://lasso.okstate.edu/>

LASSO offers free individual and group tutoring for a variety of courses.

**Student Academic Services Centers****Agricultural Sciences & Natural Resources**

136 Agricultural Hall/405-744-5395

Contact: Dr. Deb VanOverbeke

<http://casnr.okstate.edu/students/ssc>

Academic support and career guidance resources are available for CASNR students.

### **Arts & Sciences**

213 Life Sciences East/405-744-5658

Contact: Dr. Amy Martindale

<http://casstudents.okstate.edu/>

Academic support and career guidance resources are available for Arts & Sciences students.

### **Education**

106 Willard Hall/405-744-6350

Contact: Leslie Evans

<http://education.okstate.edu/watson>

Academic support, advisement and career counseling is available to all education majors.

### **Engineering, Architecture and Technology**

110 Engineering North/405-744-5276

Contact: Lance Millis

<https://studentservices.okstate.edu/advising>

Academic advising and career services are available for all CEAT students. Tutoring is offered for general math, science, and engineering courses.

### **Human Sciences**

101 Human Sciences/405-744-2772

Contact: Kristi Seuhs

<http://humansciences.okstate.edu/current-students>

Academic support and career guidance resources are available for Human Sciences students.

### **Spears School of Business**

103 Business Building/405-744-2772

Contact: Marissa McIntyre

<http://spears.okstate.edu/ss/>

Academic advisement is provided for freshmen through seniors in all business major areas.

### **University College Advising**

214 Student Union/405-744-5333

Contact: Missy Wikle

<https://uca.okstate.edu/>

University College Advising has academic advisors to help with your academic needs, whether planning your semester schedule, teaching your First-Year Seminar class, looking at degree options, or helping to bridge the gap between student life and academic success. Call or visit the office anytime Monday through Friday, between 8:00 a.m. and 5:00 p.m.

### **DISCIPLINE SPECIFIC TUTORING**

#### **Academic Development Center**

Kerr-Drummond Mezzanine/405-744-5905

<http://reslife.okstate.edu/vac>

Tutoring and supplemental instruction are available on select weekday, weekend, and evening hours.

#### **Accounting**

416 Business Building/405-744-2863

Walk-in tutoring is available for ACCT 2103, 2203, and 3103. See

<https://spears.okstate.edu/accounting/acc/> for hours.

#### **Biology & Zoology**

303 Life Sciences West

<http://biol1114.okstate.edu>

Tutoring is provided for BIOL 1114.

#### **Chemistry**

453 Physical Science/405-744-9046

Tutoring for chemistry classes is available.

### **Civil & Environmental Engineering**

315 Engineering South/405-744-9308

Tutoring for Statistics and Strength of Materials is available. Contact for more information.

### **Eta Kappa Nu Electrical and Computer Engineering Honor Society**

010 Engineering South/405-744-4910

<https://campuslink.okstate.edu/organization/eta-kappa-nu>

Tutoring is provided by Eta Kappa Nu membership for Circuits, Network Analysis, and Electronic Devices.

### **Foreign Languages**

206 Gunderson Hall/405-744-9547

<http://languages.okstate.edu>

Two 28-user labs fully equipped with personal computers and listening/recording devices are available. Students may practice vocabulary building and grammar in the target language.

### **Graduate Research and Writing Lab**

Contact: Victor D. Baeza/victor.baeza@okstate.edu/405-744-1241

<http://info.library.okstate.edu/RLS/grads>

Tutoring is available evenings from 5:00 p.m.-8:00 p.m. on Monday and Tuesday for current OSU graduate students.

### **History**

101 S Murray Hall/405-744-5680

<http://history.okstate.edu/contact>

Tutoring is given for Survey of History and upper division courses.

### **Mathematics Learning Success Center**

5<sup>th</sup> Floor Edmon Low Library/405-744-5818

<http://www.math.okstate.edu/>

Tutors are available to answer questions for classes ranging from Beginning Algebra through Calculus II. Tutoring for Differential Equations and Linear Algebra is offered at specific times.

### **Writing Outpost**

102 Q, R, S Edmon Low/405-744-6671

<http://osuwritingcenter.okstate.edu>

30-minute walk-in consultations for writing projects are offered on a first come-first served basis on Monday-Thursday evenings 7:00 p.m.-10:00 p.m.

### **Writing Center**

440 Student Union/405-744-6671

<http://osuwritingcenter.okstate.edu>

The Writing Center helps writers throughout the composing process; plan to visit early and often throughout the semester, not just the day before an assignment is due. Tutors work with students to improve brainstorming, organizational, and composing techniques.

### **Writing Center West**

103 Ag Hall/405-744-6671

<http://osuwritingcenter.okstate.edu>

30-minute walk-in consultations for writing projects are available Monday-Friday from 11:30 a.m.-2:30 p.m.

### **FOR MORE INFORMATION**

#### **go.okstate.edu/apps**

The OState app provides a mobile link to campus departments, OSU news, and maps.

#### **my.okstate.edu**

This portal connects students to a wide range of campus services including links to student email, the library, and the Online Classroom and Community (D2L).

For other comments and inquiries, please contact academics@okstate.edu.