UNIVERSITY OF WASHINGTON
ELECTRICAL ENGINEERING

UWEE Summer School Program

June 25 – August 6, 2017
University of Washington
Seattle, Washington, USA

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Where is Seattle?

A Fast Growing High-Tech City

Microsoft

amazon.com
and you're done.™

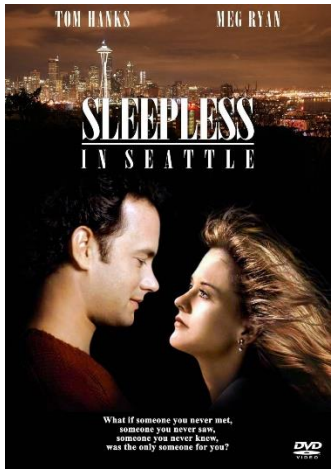
STARBUCKS COFFEE

BOEING

T-Mobile
stick together

Nintendo®

Expedia®



Seattle and the Pacific Northwest

- Mild weather within the Puget Sound area
- Abundant water (rainfall)
- Lush, verdant setting
- Comparatively low crime rates

- High regard for academics and scholarship
- Easy and diverse opportunities for a healthy lifestyle:
  - Skiing
  - Hiking
  - Boating
  - Cultural arts and events

University of Washington

- Student body: 40K+ @ Seattle campus (1/3 grad)
- Annual budget: ~$3B USD ($1.3B on research grants)
- 11th Global University Ranking (U.S. News, 2015)
- 15th in the World Academic Ranking (SJTU, 2015)
- 4th World's Most Innovative Univ. (Reuters, 2015)
- 1st ranked Medical School (primary care schools)
- 2nd in biomedical engineering funding from NIH
- 6+1 Nobel prize winners since 1989
- 42/16 National Academy of Science/Engr members
- 3 National Medal of Science recipients

A Beautiful Campus @ Seattle WA

Electrical Engr. Department

- Founded in 1905
- New EE Building in 1997
- Degrees offered:
  - Bachelor of Science in Electrical Engineering (BSEE)
  - Master of Science in Electrical Engineering (MSEE)
  - Doctor of Philosophy in Electrical Engineering (Ph.D.)
- Rankings 2015:
  - The Chronicle of Higher Education: 8th
  - US News and World Report: 18th (graduate)
  - US News and World Report: 18th (undergraduate)

Our Faculty

- 41 Tenure-Track + 10 Research + 24 Adjunct + ~60 Affiliate Faculty
- 27 IEEE Fellows + 2 NAE Fellows
- Many Young Investigator Awards:
  - PECASE, NSF PYI, NSF Career, ONR YIP, AFOSR YIP, ARO YIP, NIH Career, IEEE EMBS Early Career
- Several MIT Technology Review Awards
- Significant professional services, leadership, and industrial consultant roles

Our Research Strengths

- **Communications and Networking:** wireless networking systems, secure networks and protocols, wireless multimedia
- **Electromagnetics and Remote Sensing:** microwave/millimeter-wave remote sensing, antenna design/modeling, computational electromagnetics
- **Integrated Systems, Circuits, VLSI:** low power circuits, wireless sensors, mixed signal circuits
- **Nanotechnology, MEMS, Photonics:** nanoelectronic/photonic devices, biological and molecular systems and models
- **Power and Energy:** modeling of heterogeneous energy systems, operating/planning of energy systems
- **Speech, Image, and Video Processing:** multimedia data analyses, data mining and machine learning, speech and language processing
- **Systems, Controls & Robotics:** bio-robotics, human-brain interfaces

Summer Program Overview

- Customized program for international Electrical Engineering and Computer Engineering students
- Two engineering courses, 24 hours/week (lecture and lab)
- American academic culture course, 2 hours/week (lectures and experiences)
- Visits to Seattle area businesses relevant to program curriculum (3-4 companies: Microsoft, Boeing, Tableau, Voicebox, T-Mobile, etc)
- Student immigration support (I-20s, F-1 student visas)
- Ground transportation to/from SeaTac Airport
- UW student experience: student housing, campus life

Weekly Course Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 – 9:20	EE233	EE299	EE233	EE299	EE233
9:30 – 10:20					
10:30 – 11:20	American Academic Culture		American Academic Culture		
Lunch Break					
13:30 – 14:20	Lab or Quiz (EE233)	Lab or Quiz (EE299)	Lab or Quiz (EE233)	Lab or Quiz (EE299)	Visit or Activities
14:230 – 15:20					
15:30 – 16:20					

EE233 CIRCUIT THEORY

- **Goals:** To learn how to analyze electric circuits in the frequency domain; to calculate power for electric circuits; to recognize and analyze common filters such as low-pass, high-pass, band-pass, and band-reject both for passive and active circuits; to learn how to use laboratory instruments such as the function generator, oscilloscope and multimeter for analyzing electric circuits that you build in the laboratory; to learn how to use MultiSim; to learn how to write a lab report on your experiments; to prepare students for more advanced courses in circuit analysis and design.
- **Prerequisites by Topic:**
  - DC circuit analysis
  - Transient analysis of electric circuits in the time domain
  - Solution of first and second order linear differential equations
  - Manipulation of complex numbers
- **Topics:**
  - Sinusoidal sources and responses, Phasors, network theorems
  - Average and Reactive power, complex power, power factor
  - Laplace transformation techniques
  - Circuit analysis with Laplace Transforms, transfer functions
  - Passive filters
  - Active filters
  - Basic EE laboratory, components, instrumentation and simulation
- **Course Structure:** Lecture (6 hours / week), Laboratory & Quiz (5+1 hours / week), weekly HWs
- **Grading:** 20% Homework, 20% Laboratories, 10% Lab Test & Quizzes, 20% Midterms, 30% Final

EE299 INTRODUCTION TO C AND MICROPROCESSORS

- This hands-on class that introduces the ANSI C language and microprocessors. Through in-class exercises, homework, and a series of practical lab projects, students are encouraged to develop and practice good software design methodologies using the C language then apply these skills towards developing, debugging, and testing embedded applications for an Arduino microprocessor.
- **Goals:** to learn, to work with, and to develop applications of modest complexity in the C language for an Arduino microprocessor.
- **Topics:**
  - ***Introduction*** **--** A Brief Look Inside the Computer, Introduction to C, Programs, and Program Design
  - ***The Microprocessor*** **--** Basic Architecture, Hardware and Software, Input and Output
  - ***Identifiers C Data Types Variables and Numbers***
  - ***Basic Electronics*** **--** Introducing Electricity, Fundamental Items and Terminology
  - ***Program Structure***
  - ***Characters and Strings***
  - ***Operators***
  - ***Control and Control Flow***
  - ***Pointers***
  - ***Basic Data Structures - Containers***
  - ***Bringing Your Program Together***
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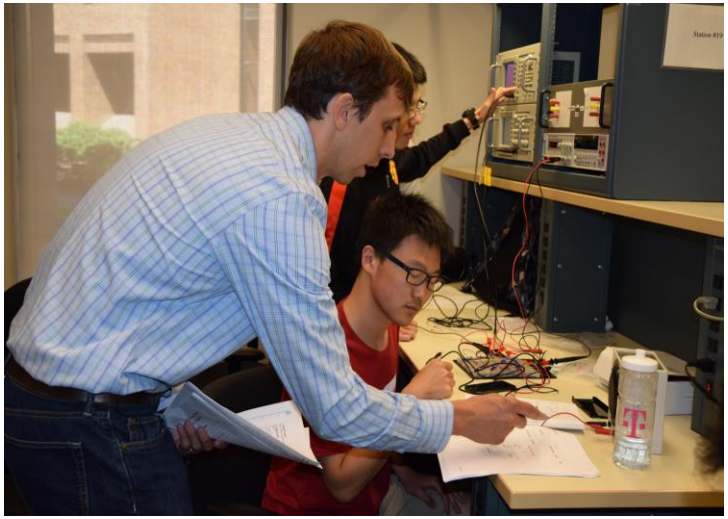
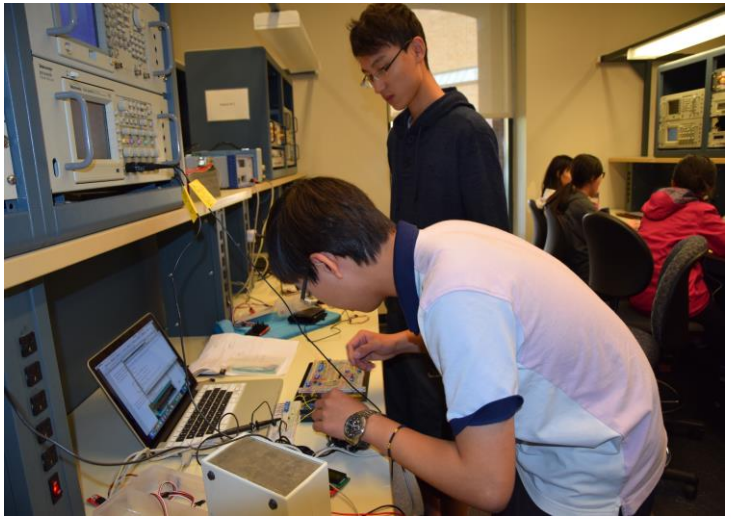
Snapshots

Visiting Microsoft Research

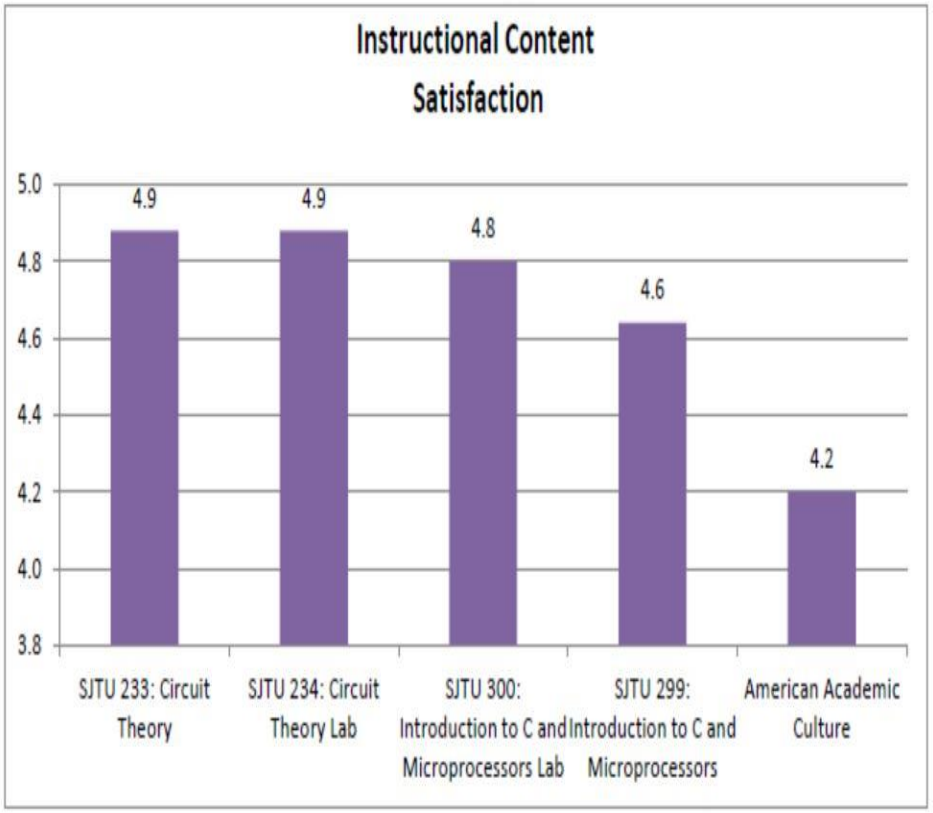
Classes and Labs

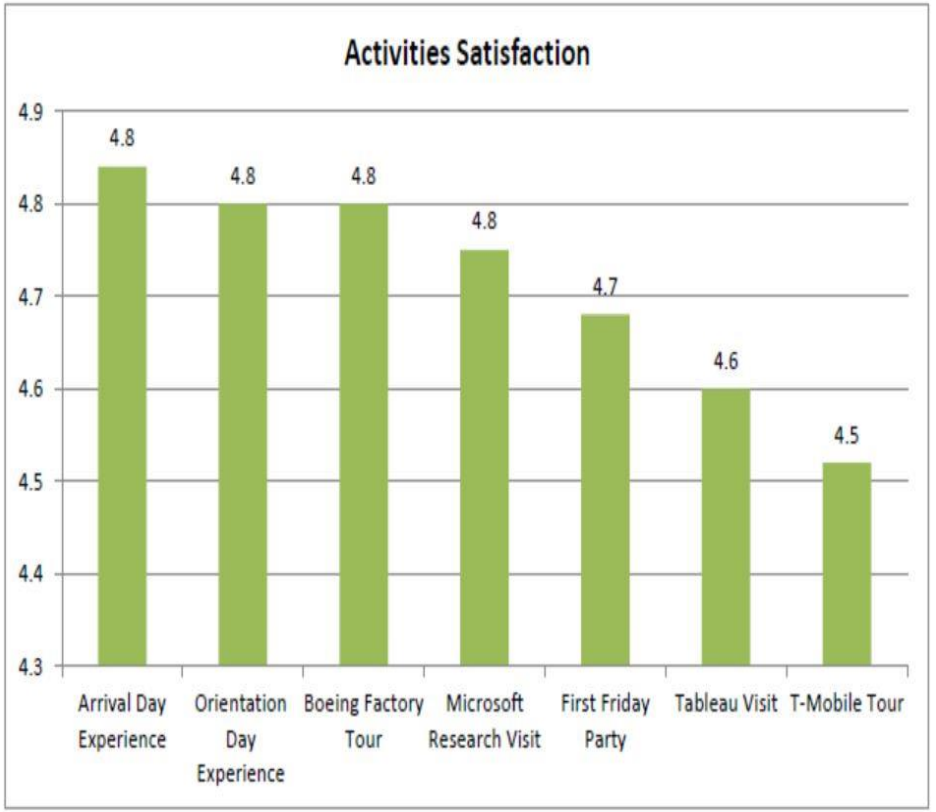




Social Activities

Students Evaluations (2015)





Summer Program Cost Overview

- Program Tuition
  - Program: $5,500 per student (minimum 37 students)
- Travel Costs
  - Separate from program tuition
  - Your school book/purchase flights
  - All students on one flight to/from Seattle
  - Ground transportation to/from SeaTac provided by UW
- Housing & Meal Costs
  - Separate from program costs
  - UW dormitory housing (North Campus)
  - Double occupancy (shared rooms); singe occupancy (very limited)
  - Student flexible dining options: debit cards for campus food venues
- **Total estimated cost per student - $9,800**
  - **Program $5,500; travel ~$1,000; housing ~$2,460 (*single*); meals ~$820**

Hope to see you in Seattle!