

UMass/Amherst
Microwave Engineering Program
goes
Live!

In order to address continuing changes in the RF-technical field marketplace, the Microwave Engineering program at the University of Massachusetts in Amherst has created a set of its key Microwave Engineering courses, taught by the University's world-class faculty, and made available for full college credit to off-campus students. Many course offerings are conducted at the same-time as the on-campus versions of the courses, allowing for off-campus students to benefit from the real-time interaction that is critical to the engagement and learning process.

Students completing a subset of these courses will be awarded a *Microwave Engineering Certificate*. Details of this certificate program, and further links, can be found on the opposite side of this flyer.

Interested? Contact microwaves@umass.edu for details.

ECE 584: Microwave Engineering I (Prof. P. Siqueira)

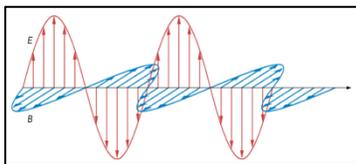
Fundamentals of Microwave Engineering: review of basic field theory, understanding and modeling transmission lines, use of network parameters, microwave resonators and design of matching networks.

Fall offering, TTh 4 – 5:15 pm EDT. This course has a lab-component that can be conducted at the student's home institution, or at a special lab equipped for microwave engineering education at the UMass extension campus in Newton, MA.



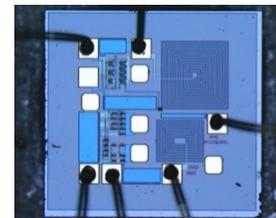
ECE 606: Electromagnetic Field Theory (Prof. R. Janaswamy)

Maxwell's equations, electromagnetic energy and power, constitutive parameters, Helmholtz equation, generalized plane waves, electric and magnetic currents, electromagnetic duality, equivalence principle, induction theorem, optical theorem, reciprocity theorem, Green's functions, TE/TM field decomposition, rectangular harmonics, cylindrical and spherical harmonics. Fall offering, MWF 1:25 – 2:15 pm EDT.



ECE 683: Active Microwave Circuits (Prof. R. Jackson)

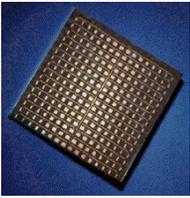
Theory and techniques used in the design of modern microwave and millimeter wave active circuits. Emphasis on amplifier and oscillator circuits using devices such as FETs, HEMTs, HBTs and optoelectronic devices. References to modern methods, tools and materials will be used as much as possible. Spring offering, MW 4:00 – 5:15 pm EST.



ECE 686: Introduction to Radar Systems (Prof. S. Frasier)

Basics of radar system design and analysis: the radar range equation, radar cross section, measurement ambiguities, radar clutter and statistics, detection and receiver design, transmitters and antenna systems. The course covers pulsed, continuous-wave, and frequency-modulated radars, Doppler radar, and Synthetic Aperture Radar. Fall offering, TTh 10:00 – 11:15 am EDT.

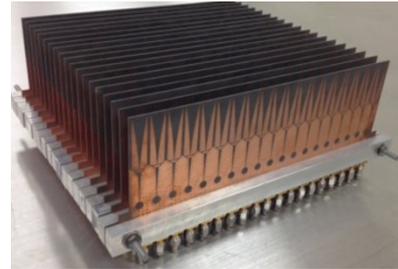
ECE 687: Antenna Theory and Design (Prof. D-H. Kwon)



Analysis and synthesis of antenna elements and arrays. Topics include design and analysis of simple antennas, method of moments, near- and far-field calculations, self- and mutual-impedances, aperture efficiency, travelling wave and broadband antennas, use of simulation software for the design and analysis of basic antenna structures. Fall offering, TTh, 11:30 – 12:45 pm EDT.

ECE 697L: Phased Arrays (Prof. M. Vouvakis)

This course provides a working knowledge of the key parameters of modern phased array antenna systems. Students will study phased array systems with an emphasis on scanning, sidelobe levels, gain, bandwidth, sensitivity, linearity, etc. that are important for high-performance systems. The effects of scanning on antenna input impedance will be analyzed and array blindness will be demonstrated. Spring offering, TTh 11:30 – 12:45 pm EST.



Microwave Engineering Certificate

By taking any four of the six microwave courses listed above, the University of Massachusetts will grant a *Graduate Certificate in Microwave Engineering* that shows that the student has achieved a coherent foundation in the analysis and design of the microwave components and systems. Such a certificate will demonstrate a university-acknowledged level of skills that are important in many of the wireless and high-bandwidth wired communication and sensing systems that we use every day (e.g. cellular and satellite communications, wireless networks and radar systems). To sign up for remote participation in these courses, go to www.umass.edu/uww and follow the “Classes” link at the top of the page. On the left, under the “Subject” heading, choose the filter for Electrical and Computer Engineering.

Course schedule:

Fall schedule

| MON | TUES | WED | THUR | FRI |
|-----------|-------------|-----------|-------------|-----------|
| | 10:00-11:15 | | 10:00-11:15 | |
| | ECE 686 | | ECE 686 | |
| | 11:30-12:45 | | 11:30-12:45 | |
| | ECE 687 | | ECE 687 | |
| 1:25-2:15 | | 1:25-2:15 | | 1:25-2:15 |
| ECE 606 | | ECE 606 | | ECE 606 |
| 2:30-3:45 | | 2:30-3:45 | | |
| ECE 603 | | ECE 603 | | |
| | 4:00-5:15 | | 4:00-5:15 | |
| | ECE 584 | | ECE 584 | |

Spring schedule

| MON | TUES | WED | THUR | FRI |
|-----------|-------------|-----------|-------------|-----|
| | | | | |
| | | | | |
| | 11:30-12:45 | | 11:30-12:45 | |
| | ECE 697L | | ECE 697L | |
| | | | | |
| | | | | |
| | | | | |
| 4:00-5:15 | | 4:00-5:15 | | |
| ECE 683 | | ECE 683 | | |

These courses will be offered on a yearly basis, with most being held concurrently with their on-campus counterpart.