

Digital Signal/Image Processing

Example outcomes gained by taking this track would include joining groups that design algorithms and utilize them in areas like Radar, Communications, Remote Sensing and other high technology applications. Employers include: Microsoft, Google, Hewlett-Packard, Intel, Northrop-Grumman, General Dynamics, General Motors and many others. While there are many possible tracks to this area, the fundamental courses include: following:

- ECE 514 Random Processes
- ECE 513 Digital Signal Processing
- ECE 764 Digital Image Processing
- ECE 763 Computer Vision
- ECE 515 Digital communications

The advanced offerings are used to allow a concentration within this area

- ECE 751/ECE 759 Estimation Detection Theory/Pattern Recognition
- ECE 766 Wireless Communications: Signal Processing Principles
- ECE 747 Digital Signal Processing Architecture
- ECE 752 Information Theory

For those students interested in further studies in the area, and prepare a career in research, cross-disciplinary knowledge is essential (math, physics, computer science, biology ..). One could cover that background by outside EE courses (required minor). These include and are not limited to:

- CS 520 Artificial Intelligence I
- CS 562 Computer Graphics
- CS 565 Graph Theory
- CS 580 Numerical Analysis 1
- CS 720 Artificial Intelligence 2
- CS 780 Numerical Analysis 2
- MA 501 Advanced Mathematics for Engineers and Scientists I
- MA 502 Advanced Mathematics for Engineers and Scientists II
- MA 505 Linear Programming
- MA 511 Advanced Calculus I
- MA 512 Advanced Calculus II
- MA 515 Analysis I
- MA 518 A first Course in Differential Geometry
- MA 520 Linear Algebra
- MA 523 Linear Transformations and Matrix Theory
- MA 555 Introduction to Manifold Theory
- MA 706 Nonlinear Programming
- MA 711 Analytic Function Theory I
- MA 712 Analytic Function Theory II
- MA (OR) 719 Vector Space Methods in System Optimization
- MA 723 Theory of Matrices and Applications
- MA 784 Nonlinear Equations and Unconstrained Optimization
- CS 761 Advanced Topics in Computer Graphics
- MAE522 Non Linear System Analysis and Control
- MAE721 Robust Control with Convex Methods

In addition to courses that are directly related to DSP and IP, numerous EE course can provide further breadth and depth as typically required by a Ph.D. program. These include.

- ECE 742 Artificial Neural Networks
- ECE726 Advanced Feedback Control
- ECE755 Advanced robotics
- ECE 570 Computer Networks
- ECE 575 Introduction to Wireless Networking
- ECE 582 Wireless Communication Systems
- ECE726 Advanced Feedback Control
- ECE755 Advanced robotics

Sample MS Plan of Work

These plans of work are suggestions only. Feel free to seek other advice or to structure your own curricula. Please note that the actual courses taught are constantly changing, and these might be out of date. These are written assuming you are a full time student taking 10 courses over three semesters. You might choose to not overload in Spring, but take one last course in Fall after this.

Signal and Image Processing					
Fall		Spring		Fall	
ECE513	SP&CI	ECE515	Comm	ECE763	SP&CI
ECE514	None	ECE751(odd) ECE759(even)	SP&CI	ECE747 or ECE762	Arch Comm
ECE582	Comm	ECE570	NET	Elective	
		ECE766(odd) ECE767(even) ECE752(odd)	Comm Comm Comm		

Electives are chosen from the lists of related courses. Note the requirement for 21 hours of ECE courses and two 700 level courses in the MS plan.

Associated Faculty

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