GRADUATE CERTIFICATE IN DATA ENGINEERING

The certificate program provides education on both Theoretical Foundation (TF) of Data Engineering and Applications (AP) of Data Engineering in specific engineering domains. The certificate requires completing 12 credits of coursework. At least 6 credits must be taken from courses listed under the Theoretical Foundation (TF) category. These courses provide training on the central theory and methods of Data Engineering, informed by physical and dynamical models that generally arise in engineering processes. At least 3 credits must be taken from courses listed under the Applications (AP) category. These courses provide training on applications of Data Engineering methods in specific engineering domains, by tailoring and applying data analysis to specific data acquisition techniques and models that are suitable for a particular engineering domain. The domains currently include Signal and Image Processing, Biomedical Engineering, Computer Engineering, and Systems Engineering. Lists of approved TF courses and AP courses are provided under "Program Requirements".

Requirements
Effective Fall 2022

Additional coursework may be required due to prerequisites.

Code	Title	Credits
Theoretical Foundations (TF)		
Select a minimum of 6 credits from the following: [1]		6-9
ECE 514	Applications of Random Processes	
ECE 520	Optimization Methods--Control and Comm. [1]	
or ENGR 510	Engineering Optimization: Method/Application	
ECE 652	Estimation and Filtering Theory	
ECE 656	Machine Learning and Adaptive Systems	
SYSE 571	Analytics in Systems Engineering	
Applications (AP)		
Select a minimum of 3 credits from the following list of courses for specific engineering application domains:		3-6
AP: Signal and Image Processing		
ECE 512	Digital Signal Processing	
ECE 513	Digital Image Processing	
AP: Biomedical Engineering		
ECE 517/ BIOM 517	Advanced Optical Imaging	
BIOM 526/ ECE 526	Biological Physics	
ECE 537/ BIOM 537	Biomedical Signal Processing	
AP: Computer Engineering		
ECE 528/CS 528	Embedded Systems and Machine Learning	
ECE 554	Computer Architecture	
ECE 561/CS 561	Hardware/Software Design of Embedded Systems	
ECE 658/CS 658	Internet Engineering	
AP: Systems Engineering		
SYSE 532/ ECE 532	Dynamics of Complex Engineering Systems	
SYSE 569	Cybersecurity Awareness for Systems Engineers	
Program Total Credits		**12**

*This certificate may have courses in common with other graduate certificates. A student may earn more than one certificate, but a given course may be counted only in one certificate.

[1] ECE 520 and ENGR 510 cannot be both taken to satisfy this requirement.