Core Graduate Program Research Areas  
Marquette University Electrical and Computer Engineering

Required Foundation courses:  
EECE6010 Advanced engineering mathematics  
EECE6020 Stochastic processes

Core Research Areas  
(Used as Primary and Related areas for the PhD Written Qualify Exam)

1. **Signal processing**  
   Core course: EECE 5510 Digital Signal Processing  
   Related undergraduate courses: EECE 5560  
   Related graduate courses: EECE 6510, 6520, 6530, 6540

2. **Control theory**  
   Core course: EECE 6310 Modern Control Theory  
   Related undergraduate courses: ELEN 3020, EECE 5310, 5320  
   Related graduate courses: EECE 6320, 6330, 6340

3. **Electromagnetic fields and waves**  
   Core course: EECE 6120 Electromagnetic Theory  
   Related undergraduate courses: EECE 3110, 3120, 5150  
   Related graduate courses: EECE 6130

4. **Power and energy systems**  
   Core courses: EECE 5210 Design and Analysis of Motor Drive Systems  
   Related undergraduate courses: EECE 3210, 5210, 5220, 5230, 5240, 5250  
   Related graduate courses: EECE 6210, 6220, 6230

5. **Solid-state devices and sensor systems**  
   Core course: ELEN 4430 Physical Principles of Solid State Devices  
   Related undergraduate courses: EECE 5450, 5460  
   Related graduate courses: EECE 6420, 6430, 6450

6. **Algorithms and machine learning**  
   Core course: EECE 6810 Algorithm Analysis and Application  
   Related undergraduate courses: COEN 5650, 5850, 5860, 5870  
   Related graduate courses: EECE 6820, 6822, 6830, 6840