Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering Biomedical

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 one or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

ECE 6221 – Micromachining w/ Lab (3.0) *Offered Fall and Spring*
Fall Semester
ECE 6760 – Modeling Bio Networks (3.0) *Periodic*
ECE 6960 – Special Topics: Image Analysis Seminar (1.0)
ECE 7320 – 3D Reconstruction in Medical Imaging (3.0) *Even Years*
ECE 6231 – Microsensors (4.0) *Odd Years, Req. 6221*
COMP 5005 – Programming for Engineers (3.0)
COMP 5190 – Foundations of Data Analysis (3.0)
Spring Semester
ECE 5480 – Diagnostic & Therapeutic Ultrasound (3.0) *Odd Years*
BME 5110 – Regulatory Affairs I (3.0)
BME 5160 – Engineering Aspects of Clinical Medicine (2.0)
BME 6433 – Biological Statistical Signal Processing (3.0)

Year 1		Optional	Year 2
Fall	**Spring**	**Summer**	**Fall**
ECE 6900 Graduate Seminar I 1.0	**ECE 6910** Graduate Seminar II 1.0	**ECE 6950** Special Study (Project Option Only) 3-6.0	**ECE 6360 (3.0)** *Odd* Bioelectricity - - - - - - - - - - **ECE 6330 (3.0)** *Even* Health Technology
ME EN 6130 Design Implications 3.0	**COMP 5360** Introduction to Data Science 3.0		**ECE 6960** Spec. Top.: Neural Data Analysis & Modeling 3.0
ECE 6654 Neural Engineering & Neuro Robotics 3.0	**ECE 7310** Advanced Magnetic Resonance Imaging 3.0		**ECE 6961** Medical Imaging Systems 3.0
ECE 6530 Digital Signal Processing 3.0	**ECE 6960** Biomedical Micro Devices 3.0		**ECE 6532** Digital Image Processing *Req: 6530* 3.0
11 Credits	**11 Credits**		**12 Credits**
			Total Credits: 34

Required	Advanced ECE	Allied	Final Exam Option

MS Electrical Engineering Circuits & Systems

Department of ELECTRICAL & COMPUTER ENGINEERING — THE UNIVERSITY OF UTAH

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 one or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ECE 6680 – Elec. Forensic Eng. & Failure Analysis (3.0) *Odd Years*
ECE 6730 – Radio Frequency IC Design (3.0) *Periodic*
ECE 6960 – Data Converter Circuits & Systems (3.0) *Periodic*

Spring Semester
CS 7937 – Architecture / VLSI Seminar (1.0)
ECE 6725 – Advanced Analog IC Design (3.0) *Periodic*
ECE 6323 – Microwave Engineering II (3.0) *Odd Years*
ECE 6960 – High-Speed Comm. Circuits & Systems (3.0) *Periodic*
ECE 6960 – Wide Bandgap Semiconductors (3.0) *Periodic, 2024*

Program of Study

Year 1 Fall	Year 1 Spring	Optional Summer	Year 2 Fall
ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**ECE 6261** Physical Theory of Semiconductor Devices — 3.0
ECE 6710 Digital VLSI Design — 4.0	**ECE 6770** Advanced Digital VLSI *Req: 6710* — 4.0		**COMP 5190 (3.0)** Found. Data Analysis / **ECE 6745 (3.0) Odd** Testing of Dig. Circuit
ECE 6720 Fund. Analog IC Design — 3.0	**COMP 5360 (3.0)** Intro to Data Science / **ECE 6740 (3.0) Odd** CAD of Digital Cir.		**ECE 6322** Microwave Eng. I w/ lab — 4.0
ECE 5610 (3.0) Power Elec. Fund. / **ECE 6755 (3.0) Odd** RT Asynch Cir. Design	**ECE 6780** Embedded System Design — 4.0		
11 Credits	**12 Credits**		**10 Credits**

Total Credits: 33

Legend: Required · Advanced ECE · Allied · Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering Electromagnetics

MS Degree Requirements
- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options
Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.
Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.
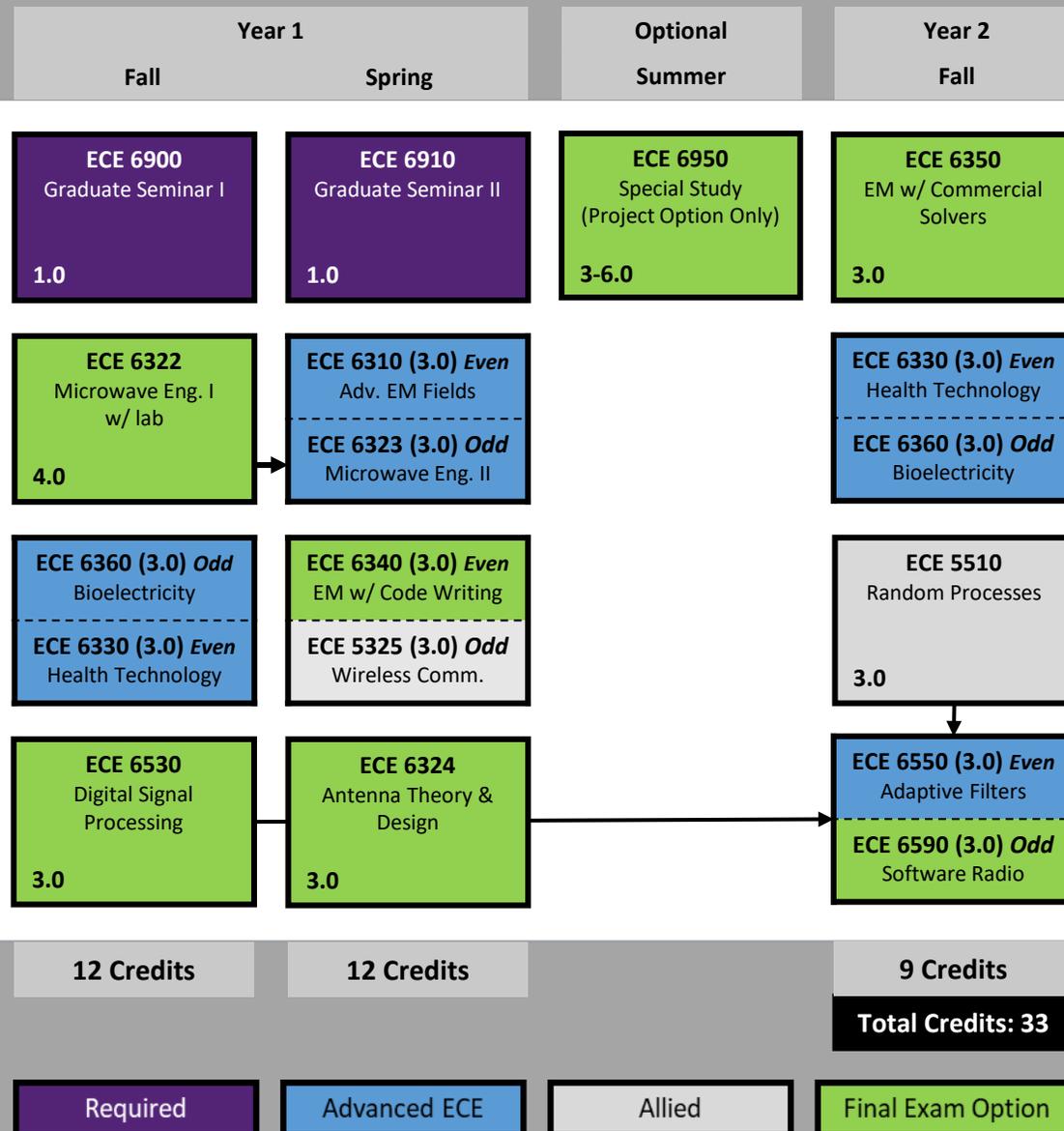
Other Recommended Courses
Fall Semester
MATH 5610 – Numerical Analysis I (4.0)
ECE 6730 – Radio Frequency IC Design (3.0) *Periodic*
ECE 6654 – Neural Engineering & NeuroRobotics (3.0)
ECE 5410 – Optics I (3.0)
GEO 6250 – Inversion Theory (3.0)
Spring Semester
MATH 5600 – Survey of Numerical Analysis (4.0)
MATH 5620 – Numerical Analysis II (4.0)
ECE 5412 – Optics II (3.0) *ECE 5410 NOT required as pre-req.*
ECE 5480 – Diagnostic & Therapeutic Ultrasound (3.0) *Periodic*
ECE 6420 – Fourier Optics & Holography (3.0) *Periodic, 2025*
ECE 6250 – Introduction to Quantum Computers (3.0)

	Year 1		Optional	Year 2
	Fall	**Spring**	**Summer**	**Fall**
	ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**ECE 6350** EM w/ Commercial Solvers — 3.0
	ECE 6322 Microwave Eng. I w/ lab — 4.0	**ECE 6310 (3.0)** *Even* Adv. EM Fields / **ECE 6323 (3.0)** *Odd* Microwave Eng. II		**ECE 6330 (3.0)** *Even* Health Technology / **ECE 6360 (3.0)** *Odd* Bioelectricity
	ECE 6360 (3.0) *Odd* Bioelectricity / **ECE 6330 (3.0)** *Even* Health Technology	**ECE 6340 (3.0)** *Even* EM w/ Code Writing / **ECE 5325 (3.0)** *Odd* Wireless Comm.		**ECE 5510** Random Processes — 3.0
	ECE 6530 Digital Signal Processing — 3.0	**ECE 6324** Antenna Theory & Design — 3.0		**ECE 6550 (3.0)** *Even* Adaptive Filters / **ECE 6590 (3.0)** *Odd* Software Radio
	12 Credits	**12 Credits**		**9 Credits**

Total Credits: 33

Legend: Required | Advanced ECE | Allied | Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering
EM Applied to Geophysics and Wireless Communications

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
MATH 5610 – Numerical Analysis I (4.0)
ECE 6730 – Radio Frequency IC Design (3.0) *Periodic*
ECE 5410 – Optics I (3.0)
GEO 6320 – Signal Processing in the Geosciences (3.0)
GEO 6240 – Electromagnetic Methods (3.0)

Spring Semester
MATH 5600 – Survey of Numerical Analysis (4.0)
MATH 5620 – Numerical Analysis II (4.0)
ECE 5480 – Diagnostic & Therapeutic Ultrasound (3.0) *Periodic*
ECE 6420 – Fourier Optics & Holography (3.0) *Periodic, 2025*

Year 1		Optional	Year 2
Fall	Spring	Summer	Fall
ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**GEO 6250** Inversion Theory — 3.0
ECE 6322 Microwave Eng. I w/ lab — 4.0	**ECE 6960** Optics II *5410 not a pre-req* — 3.0	*Optics II will be cross-listed between 5412 and 6960. Please enroll in the upper-level course to meet MS degree requirements*	**ECE 6350** EM w/ Commercial Solvers — 3.0
ECE 6331 Optics for Energy — 3.0	**ECE 6310 (3.0) *Even*** Adv. EM Fields / **ECE 5325 (3.0) *Odd*** Wireless Comm.		**ECE 5510** Random Processes — 3.0
ECE 6530 Digital Signal Processing — 3.0	**ECE 6340 (3.0) *Even*** EM w/ Code Writing / **ECE 6324 (3.0)** Antenna Theory		**ECE 6550 (3.0) *Even*** Adaptive Filters / **ECE 6590 (3.0) *Odd*** Software Radio
11 Credits	11 Credits		12 Credits

Total Credits: 33

Legend: Required (purple) | Advanced ECE (blue) | Allied (gray) | Final Exam Option (green)

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering
EM and Digital Health

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ECE 6760 – Modeling Bio Networks (3.0) *Periodic*
ECE 6322 – Microwave Engineering I (4.0)
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
ECE 5480 – Diagnostic & Therapeutic Ultrasound (3.0) *Periodic*
MST 6210 – Operations & Project Management (3.0)
ENGIN 6030 – Patent Law & Strategy (3.0)

Year 1		Optional	Year 2
Fall	**Spring**	**Summer**	**Fall**
ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**ECE 6960** Image Analysis Seminar — 1.0
ME EN 6700 Intermediate Fluid Dynamics — 3.0	**BME 5150** Eng. Aspects of Clinical Medicine — 2.0		**ECE 6960** Spec. Top.: Neural Data Analysis & Modeling — 3.0
ECE 6654 Neural Engineering & Neuro Robotics — 3.0	**ECE 6960** Biomedical Micro Devices — 3.0		**ECE 6961** Medical Imaging Systems — 3.0
ECE 6360 (3.0) *Odd* Bioelectricity / **ECE 6330 (3.0)** *Even* Health Technology	**ECE 7310 (3.0)** Advanced MRI / **ECE 6960 (3.0)** *Odd* Deep Learn. Image		**ECE 6330 (3.0)** *Even* Health Technology / **ECE 6360 (3.0)** *Odd* Bioelectricity
			ECE 6530 Digital Signal Processing — 3.0
10 Credits	**9 Credits**		**10 Credits**

Total Credits: 29

Required	Advanced ECE	Allied	Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering
EM and High-Speed Circuits

MS Degree Requirements
- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ECE 5410 – Optics I (3.0)
ECE 6730 – Radio Frequency IC Design (3.0) *Periodic*
MATH 5610 – Numerical Analysis I (4.0)
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
ECE 5412 – Optics II (3.0) *ECE 5410 not required as pre-req.*
MATH 5600 – Survey of Numerical Analysis (4.0)
MATH 5620 – Numerical Analysis II (4.0)
MST 6210 – Operations & Project Management (3.0)
ENGIN 6030 – Patent Law & Strategy (3.0)

Year 1		Optional	Year 2
Fall	**Spring**	**Summer**	**Fall**
ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**MATH 5610** Numerical Analysis I — 4.0
ECE 6322 Microwave Eng. I w/ lab — 4.0	**ECE 6310 (3.0)** *Even* Adv. EM Fields / **ECE 6323 (3.0)** *Odd* Microwave Eng. II		**ECE 6710** Digital VLSI Design — 4.0
ECE 6530 Digital Signal Processing — 3.0	**ECE 6340 (3.0)** *Even* EM w/ Code Writing / **ECE 5520 (3.0)** *Odd* Digital Comm. Sys.		**ECE 6331** Optics for Energy — 3.0
ECE 6350 EM w/ Commercial Solvers — 3.0	**ECE 6324** Antenna Theory & Design — 3.0		
11 Credits	**10 Credits**		**11 Credits**
			Total Credits: 32

Legend: Required | Advanced ECE | Allied | Final Exam Option

MS Electrical Engineering EM and Optics

Department of ELECTRICAL & COMPUTER ENGINEERING — THE UNIVERSITY OF UTAH

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.
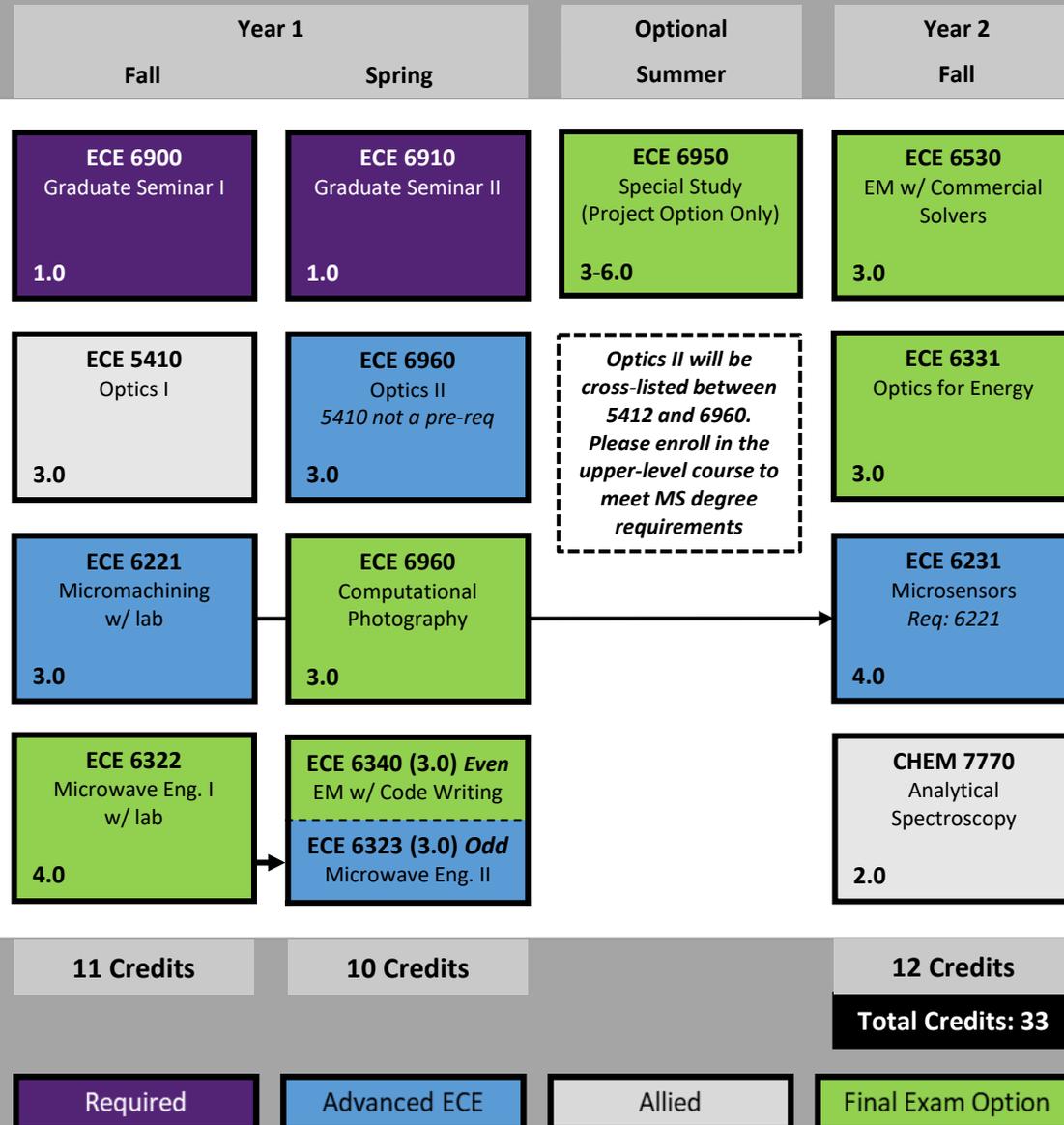
Other Recommended Courses

Fall Semester
ECE 6440 – Integrated Optics & Optical Sensors (3.0) *Varies*
ECE 7320 – 3D Reconstruction in Medical Imag. (3.0) *Even Years*
ECE 6961 – Medical Imaging Systems (3.0)
CS 6480 – Advanced Computer Networks (3.0)
CHEM 7770 – Analytical Spectroscopy (2.0)
PHYS 6770 – OMTI Lecture (3.0)

Spring Semester
ECE 6250 – Introduction to Quantum Computers (3.0)
ECE 6310 – Advanced EM Fields (3.0) *Even Years*
ECE 6420 – Fourier Optics and Holography (3.0) *Periodic, 2025*
ECE 6960 – Intro to Wide Bandgap Semiconductors (3.0) *Periodic*

	Year 1		Optional	Year 2
	Fall	**Spring**	**Summer**	**Fall**
	ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**ECE 6530** EM w/ Commercial Solvers — 3.0
	ECE 5410 Optics I — 3.0	**ECE 6960** Optics II *5410 not a pre-req* — 3.0	*Optics II will be cross-listed between 5412 and 6960. Please enroll in the upper-level course to meet MS degree requirements*	**ECE 6331** Optics for Energy — 3.0
	ECE 6221 Micromachining w/ lab — 3.0	**ECE 6960** Computational Photography — 3.0		**ECE 6231** Microsensors *Req: 6221* — 4.0
	ECE 6322 Microwave Eng. I w/ lab — 4.0	**ECE 6340 (3.0)** *Even* EM w/ Code Writing / **ECE 6323 (3.0)** *Odd* Microwave Eng. II		**CHEM 7770** Analytical Spectroscopy — 2.0
	11 Credits	**10 Credits**		**12 Credits**

Total Credits: 33

Legend: Required (purple) | Advanced ECE (blue) | Allied (grey) | Final Exam Option (green)

MS Electrical Engineering
EM and Wireless Systems with Hardware

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Degree Requirements
- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.
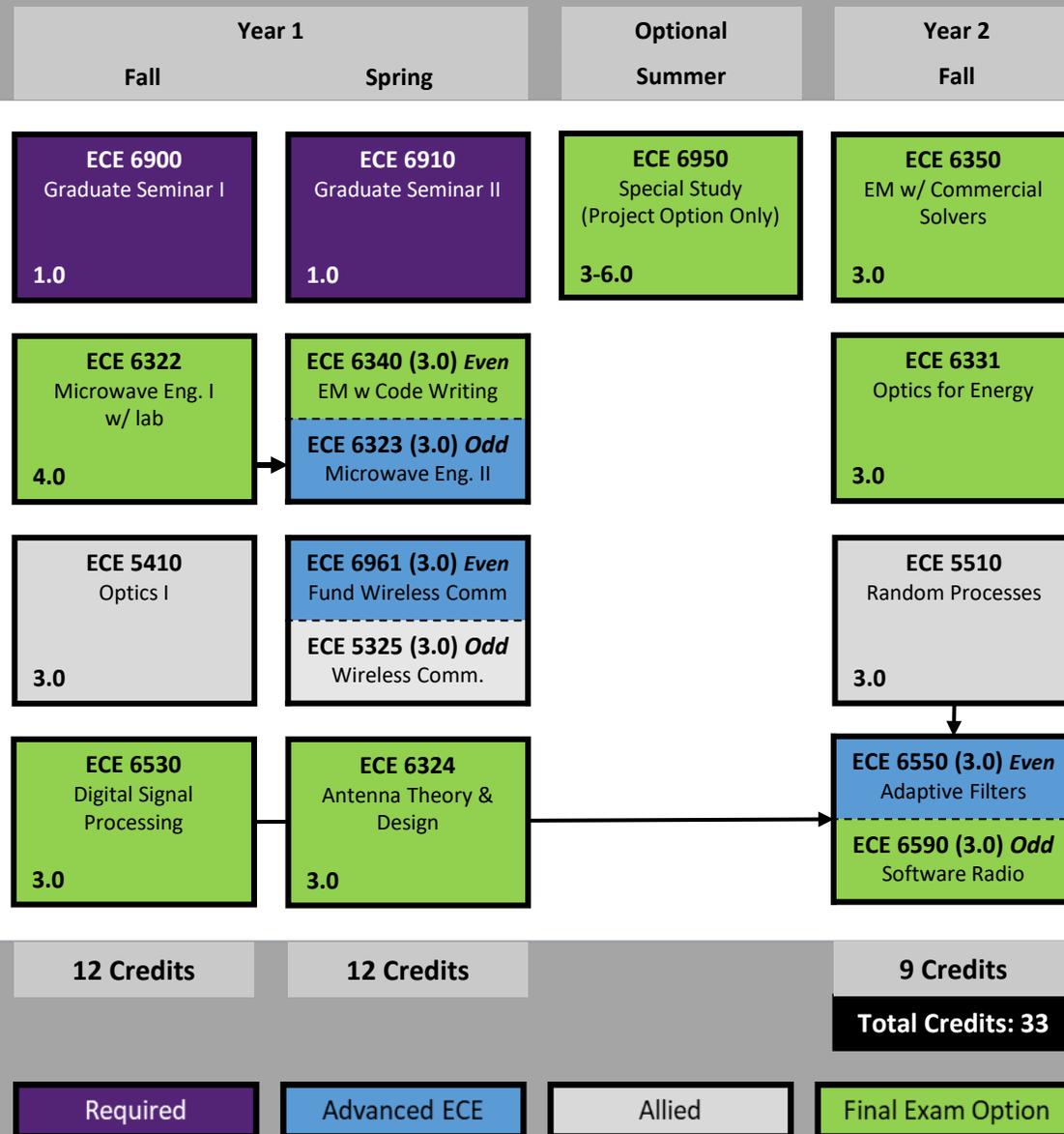
Other Recommended Courses

Fall Semester
MATH 5610 – Numerical Analysis I (4.0)
ECE 6730 – Radio Frequency IC Design (3.0) *Periodic*
ECE 6960 – Convex Optimization (3.0)
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
MATH 5600 – Survey of Numerical Analysis (4.0)
MATH 5620 – Numerical Analysis II (4.0)
ECE 5520 – Digital Communication Systems (3.0) *Odd Years*
ECE 5411 – Optical Communication Systems (3.0) *Even Years*
ECE 5412 – Optics II (3.0) *ECE 5410 not required as pre-req.*

Year 1		Optional	Year 2
Fall	Spring	Summer	Fall
ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**ECE 6350** EM w/ Commercial Solvers — 3.0
ECE 6322 Microwave Eng. I w/ lab — 4.0	**ECE 6340 (3.0)** *Even* EM w Code Writing / **ECE 6323 (3.0)** *Odd* Microwave Eng. II		**ECE 6331** Optics for Energy — 3.0
ECE 5410 Optics I — 3.0	**ECE 6961 (3.0)** *Even* Fund Wireless Comm / **ECE 5325 (3.0)** *Odd* Wireless Comm.		**ECE 5510** Random Processes — 3.0
ECE 6530 Digital Signal Processing — 3.0	**ECE 6324** Antenna Theory & Design — 3.0		**ECE 6550 (3.0)** *Even* Adaptive Filters / **ECE 6590 (3.0)** *Odd* Software Radio
12 Credits	**12 Credits**		**9 Credits**
			Total Credits: 33

Legend: Required | Advanced ECE | Allied | Final Exam Option

MS Electrical Engineering
Optics & Optoelectronics

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ECE 6440 – Integrated Photonics (3.0) *Periodic, 2025* ★
ECE 6961 – Medical Imaging Systems
ECE 7320 – 3D Reconstruction in Medical Imaging. (3.0) *Even Years*
CS 6480 – Advanced Computer Networks (3.0)
CHEM 7770 – Analytical Spectroscopy (2.0)

Spring Semester
ECE 5480 – Diagnostic Ultrasound (3.0) *Odd Years*
ECE 6250 – Introduction to Quantum Computers (3.0)
ECE 6323 – Microwave Eng. II (3.0) *Even Years*
ECE 6960 – Intro to Wide Bandgap Semiconductors (3.0) *Periodic*
ECE 6420 – Fourier Optics and Holography (3.0) *Periodic, 2025* ★
PHYS 6750 – Fundamentals of Modern Optics (4.0)

★ **Highly recommended when offered**

	Year 1		Optional	Year 2
	Fall	**Spring**	**Summer**	**Fall**
	ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**PHYS 6770** OMTI Lecture *Opt. Measure. Tech. & Instrumentation* — 3.0
	ECE 5410 Optics I — 3.0	**ECE 6960** Optics II *5410 not a pre-req* — 3.0	*Optics II will be cross-listed between 5412 and 6960. Please enroll in the upper-level course to meet MS degree requirements*	**PHYS 6775** OMTI Lab — 2.0
	ECE 6322 Microwave Eng. I w/ Lab — 4.0	**ECE 6960** Computational Photography — 3.0		**ECE 6331** Optics for Energy — 3.0
	ECE 6530 Digital Signal Processing — 3.0	**ECE 5411 (3.0)** *Even* Optical Comm. Sys. / **ECE 5325 (3.0)** *Odd* Wireless Comm. Sys.		**ECE 6532** Digital Image Processing *Req: 6530* — 3.0
	11 Credits	**10 Credits**		**11 Credits**

Total Credits: 32

Legend: Required | Advanced ECE | Allied | Final Exam Option

MS Electrical Engineering Power & Control Essentials

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.
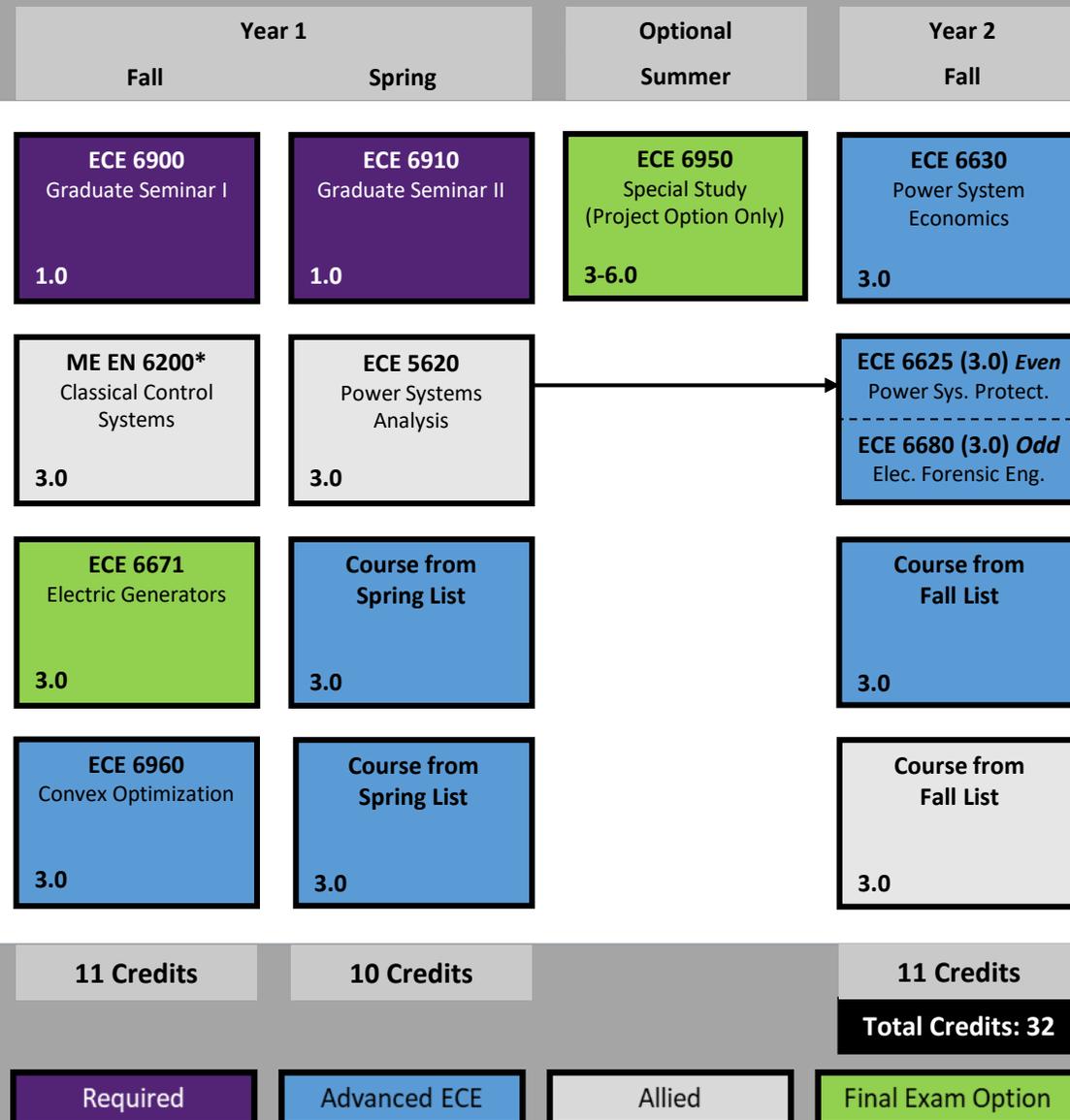
Other Recommended Courses

Fall Semester
ECE 5610 – Power Electronic Fund.
ECE 6331 – Optics for Energy
ME EN 6650 – Intermediate Heat Transfer (3.0)
ME EN 6800 – Sustainable Energy (3.0)
ME EN 6160 – Fund. of System Engineering (3.0)
ME EN 7200 – Nonlinear Control

Spring Semester
ME EN 7210 – Optimal Control
ECE 6652 – Linear Systems and State-Space Control (3.0)
ECE 6670 – Control of Electric Motors (3.0)
ECE 6960 – Special Topics: Power Sys. Ops. & Planning (4.0)
ECE 6960 – Special Topics: Power Sys. Resilience (3.0)
ECE 6615 – Classical Control Systems (3.0)*

if taken in Spring instead of ME EN 6200 in Fall

Year 1		Optional	Year 2
Fall	**Spring**	**Summer**	**Fall**
ECE 6900 Graduate Seminar I — 1.0	ECE 6910 Graduate Seminar II — 1.0	ECE 6950 Special Study (Project Option Only) — 3-6.0	ECE 6630 Power System Economics — 3.0
ME EN 6200* Classical Control Systems — 3.0	ECE 5620 Power Systems Analysis — 3.0		ECE 6625 (3.0) *Even* Power Sys. Protect. / ECE 6680 (3.0) *Odd* Elec. Forensic Eng.
ECE 6671 Electric Generators — 3.0	Course from Spring List — 3.0		Course from Fall List — 3.0
ECE 6960 Convex Optimization — 3.0	Course from Spring List — 3.0		Course from Fall List — 3.0
11 Credits	**10 Credits**		**11 Credits**
			Total Credits: 32

Legend: Required | Advanced ECE | Allied | Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering Power Focus

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ME EN 6650 – Intermediate Heat Transfer (3.0)
ME EN 6800 – Sustainable Energy (3.0)
ME EN 7200 – Nonlinear Control
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
ME EN 7210 – Optimal Control
ECE 6960 – Special Topics: Power Sys. Resilience (3.0)
ECE 6615 – Classical Control Systems (3.0) (*if taken in Spring instead of ME EN 6200 in Fall*)

Year 1		Optional	Year 2
Fall	Spring	Summer	Fall
ECE 6900 Graduate Seminar I 1.0	**ECE 6910** Graduate Seminar II 1.0	**ECE 6950** Special Study (Project Option Only) 3-6.0	**ECE 6960** Convex Optimization 3.0
ECE 6671 Electric Generators 3.0	**ECE 6960** Spec. Top.: Power Sys. Ops & Planning 3.0		**ECE 6331** Optics for Energy 3.0
ECE 6630 Power System Economics 3.0	**ECE 5620** Power Systems Analysis 3.0	→	**ECE 6625 (3.0)** *Even* Power Sys. Protect. — — — **ECE 6680 (3.0)** *Odd* Elec. Forensic Eng.
ME EN 6160 (3.0) Fund. of Sys. Engin. — — — **ECE 5610 (4.0)** *Odd* Power Elec. Fund.	**ECE 6960** Linear Systems and State-Space Control 3.0		**ME EN 6800** Sustainable Energy 3.0
10-11 Credits	**10 Credits**		**11 Credits**
			Total Credits: 32-33

Required   Advanced ECE   Allied   Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering Control Focus

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ME EN 6650 – Intermediate Heat Transfer (3.0)
ME EN 7200 – Nonlinear Control
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
ECE 6960 – Special Topics: Power Sys. Ops. & Planning (4.0)
ECE 6960 – Special Topics: Power Sys. Resilience (3.0)
ECE 6615 – Classical Control Systems (3.0) (*if taken in Spring instead of ME EN 6200 in Fall*)

Year 1		Optional	Year 2
Fall	Spring	Summer	Fall
ECE 6900 Graduate Seminar I 1.0	**ECE 6910** Graduate Seminar II 1.0	**ECE 6950** Special Study (Project Option Only) 3-6.0	**ECE 6630** Power System Economics 3.0
ECE 6671 Electric Generators 3.0	**ECE 6670** Control of Electric Motors 3.0		**ECE 6331** Optics for Energy 3.0
ME EN 6200* Classical Control Systems 3.0	**ECE 5620** Power Systems Analysis 3.0	→	**ECE 6625 (3.0)** *Even* Power Sys. Protect. - - - - - - - - **ECE 6680 (3.0)** *Odd* Elec. Forensic Eng.
ME EN 6160 Fund. of Sys. Engin. 3.0	**ECE 6652** Linear Systems and State-Space Control 3.0		**ME EN 7210** Nonlinear Control 3.0
10-11 Credits	**10 Credits**		**11 Credits**
			Total Credits: 32-33

Required	Advanced ECE	Allied	Final Exam Option

MS Electrical Engineering
Robotics

Department of ELECTRICAL & COMPUTER ENGINEERING — THE UNIVERSITY OF UTAH

MS Degree Requirements
- 2 hours of Graduate Seminar (ECE 6900/6910)
- 2 hours of Robotics Seminar (ECE 6868)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

Requirements for Robotics Area of Emphasis
- ECE 6650 Intro to Robotics **and** ECE 6651 Intro to Robot Control
- CS 6320 Computer Vision **and/or** CS 6640 Image Processing
- CS 6300 Artificial Intelligence **and/or** CS 6370 Motion Planning
- # of Robotics Electives based on Option
  - Coursework (3 Electives) | Project (2 Electives)

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 one or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall
CS 6640 – Image Processing (3.0) *Other Perception Option*
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)
ME EN 6100 – Ergonomics (3.0)

Spring
CS 6370 – Motion Planning (3.0) *Other Cognition Option*
CS 6956 – Medical Robotics (3.0)
ECE 6652 – Linear Systems and State-Space Control (3.0)
ME EN 6240 – Advanced Mechatronics (4.0)
MST 6210 – Operations & Project Management (3.0)

Year 1		Optional	Year 2
Fall	**Spring**	**Summer**	**Fall**
ECE 6900 Graduate Seminar I — 1.0	ECE 6910 Graduate Seminar II — 1.0	ECE 6950 Special Study (Project Option Only) — 3-6.0	ECE 6960 Special Topics: Robotic Millisystems — 3.0
ECE 6868 Robotics Seminar — 1.0	ECE 6868 Robotics Seminar — 1.0		ECE 6530 Digital Signal Processing — 3.0
ECE 6650 Intro to Robotics — 3.0	ECE 6651 Intro to Robot Control — 3.0		ME EN 6025 Optimization — 3.0
ME EN 6200* Classical Control Systems — 3.0	CS 6300 Artificial Intelligence (Cognition Option) — 3.0		CS 6320 Computer Vision (Perception Option) — 3.0
ECE 6654 Neural Engineering & Neuro Robotics — 3.0	ECE 6780 Embedded System Design — 4.0		
11 Credits	**12 Credits**		**12 Credits**

Total Credits: 35

Legend: Required | Advanced ECE | Allied | Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering
Signals – Information Science

MS Degree Requirements
- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 once or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ECE 6730 – Radio Frequency IC Design (3.0) *Periodic*
COMP 5190 – Foundations of Data Analysis (3.0)
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
ECE 6950 – Spec. Top.: Graph. Methods of DSP (1.0)
ECE 5325 – Wireless Comm. (3.0) *Odd*
ECE 6521 – Error Control Coding (3.0) *Periodic, next 2025*
ECE 6960 – Large-scale Inference (3.0) *Periodic*
ECE 6960 – Fundamentals of Cloud Systems (3.0) *Periodic*
COMP 5360 – Introduction to Data Science (3.0)

Program of Study Flowchart

Year 1 Fall	Year 1 Spring	Optional Summer	Year 2 Fall
ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**ECE 6960** Spec. Top.: Neural Data Analysis & Modeling — 3.0
ECE 5510 Random Processes — 3.0	**ECE 6540 (3.0)** *Even* Estimation Theory / **ECE 6520 (3.0)** *Odd* Information Theory		**ECE 6550 (3.0)** *Even* Adaptive Filters / **ECE 6590 (3.0)** *Odd* Software Radio
ECE 6530 Digital Signal Processing — 3.0	**ECE 6961 (3.0)** *Even* Fund Wireless Comm / **ECE 6960 (3.0)** *Odd* Deep Learn. Analysis		**ECE 6532** Digital Image Processing *Req: 6530* — 3.0
MATH 5610 Numerical Analysis I — 4.0	**MATH 5620 (4.0)** *Even* Numerical Analysis II / **ECE 5520 (3.0)** *Odd* Dig. Comm. Systems		**ECE 6960** Convex Optimization — 3.0
11 Credits	**11-12 Credits**		**9 Credits**

Total Credits: 33-34

Legend: Required | Advanced ECE | Allied | Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering
Signals – Wireless Communications

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 one or more times during Spring, Summer, and/or Fall semesters.
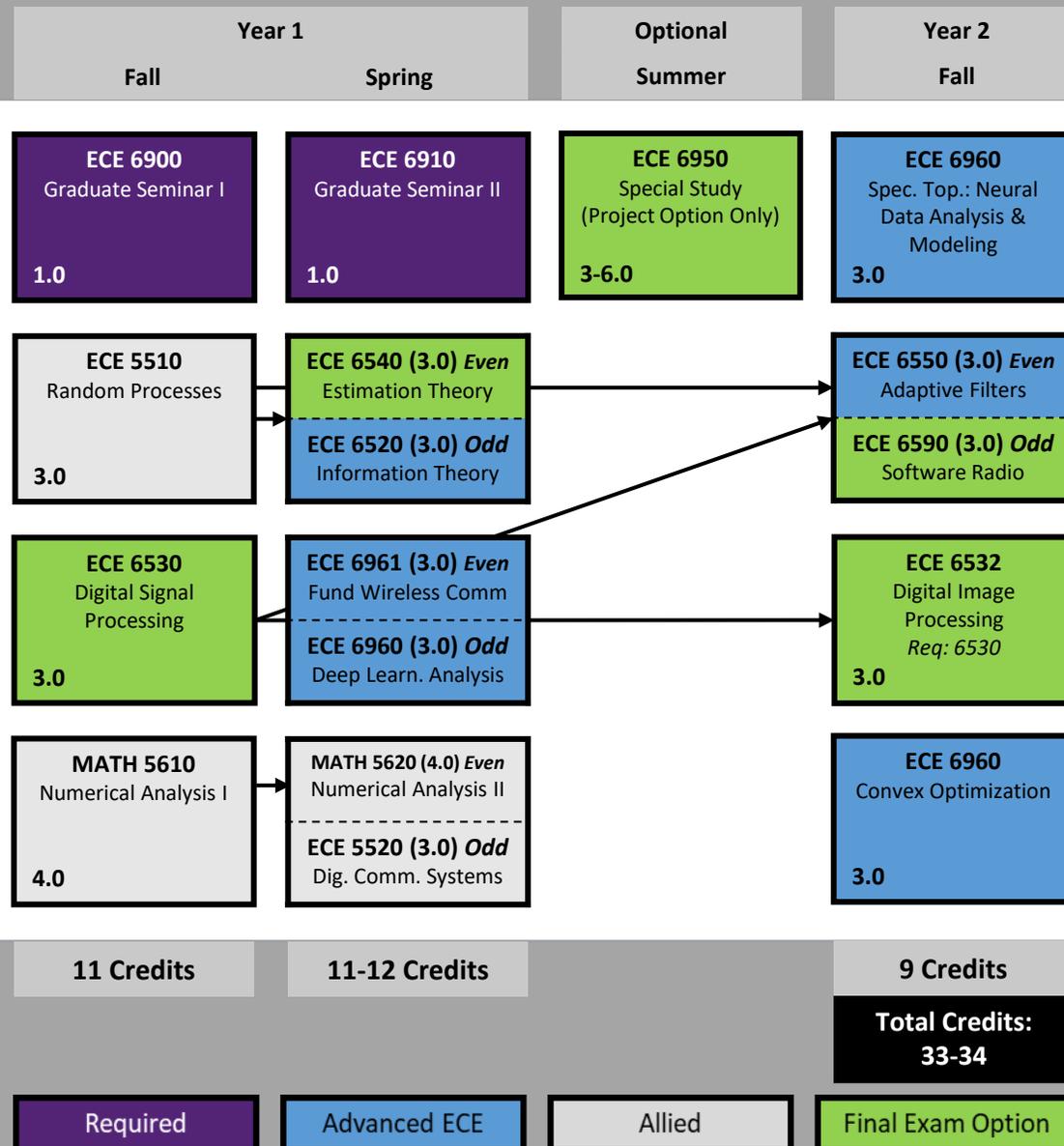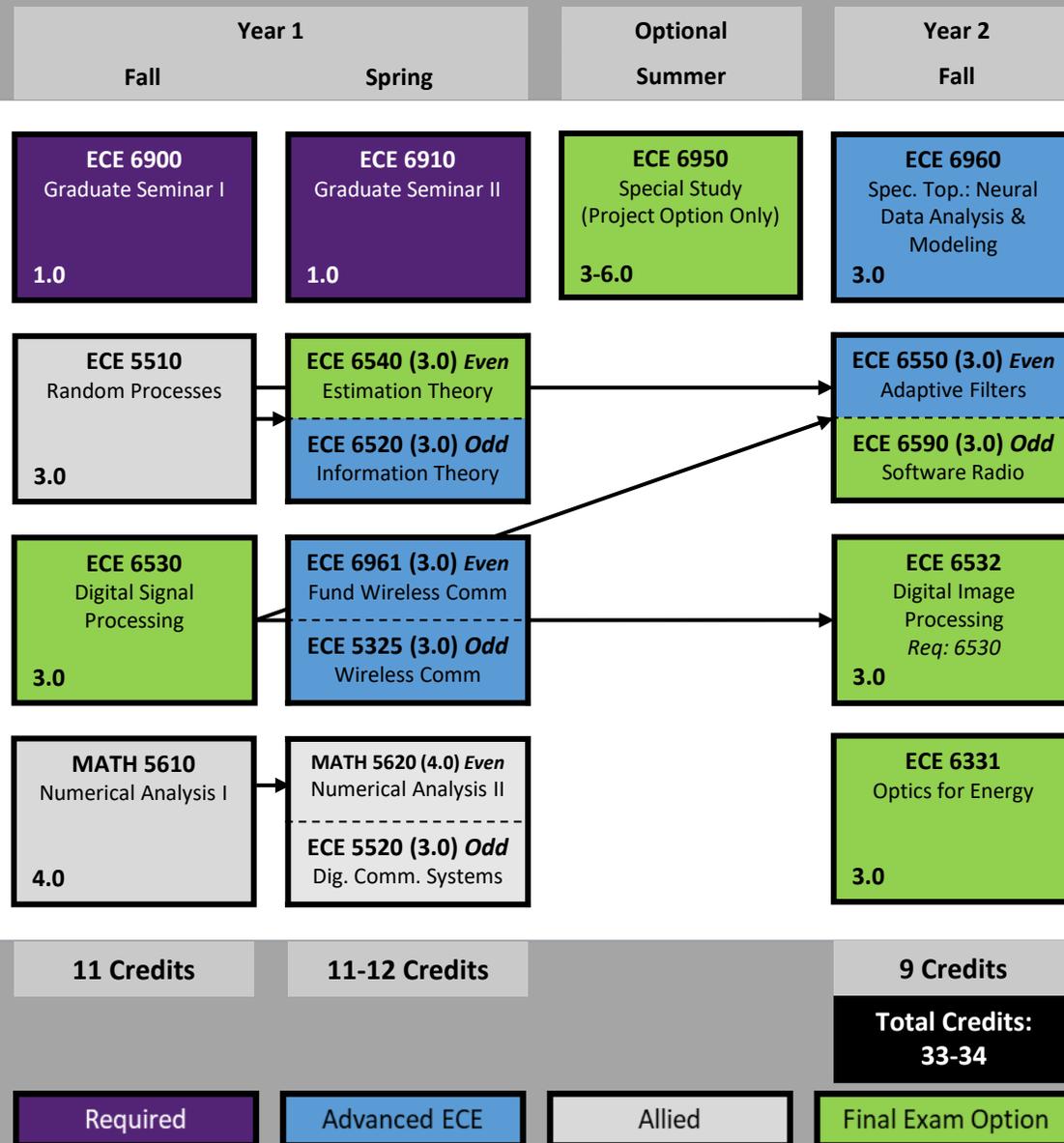
Other Recommended Courses

Fall Semester
ECE 6730 – Radio Frequency IC Design (3.0) *Periodic*
COMP 5190 – Foundations of Data Analysis (3.0)
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
ECE 6950 – Spec. Top.: Graph. Methods of DSP (1.0)
ECE 6521 – Error Control Coding (3.0) *Periodic, next 2025*
ECE 6960 – Deep Learning Image Analysis (3.0) *Odd Years*
COMP 5360 – Introduction to Data Science (3.0)

Year 1		Optional	Year 2
Fall	**Spring**	**Summer**	**Fall**
ECE 6900 Graduate Seminar I 1.0	**ECE 6910** Graduate Seminar II 1.0	**ECE 6950** Special Study (Project Option Only) 3-6.0	**ECE 6960** Spec. Top.: Neural Data Analysis & Modeling 3.0
ECE 5510 Random Processes 3.0	**ECE 6540 (3.0)** *Even* Estimation Theory / **ECE 6520 (3.0)** *Odd* Information Theory		**ECE 6550 (3.0)** *Even* Adaptive Filters / **ECE 6590 (3.0)** *Odd* Software Radio
ECE 6530 Digital Signal Processing 3.0	**ECE 6961 (3.0)** *Even* Fund Wireless Comm / **ECE 5325 (3.0)** *Odd* Wireless Comm		**ECE 6532** Digital Image Processing *Req: 6530* 3.0
MATH 5610 Numerical Analysis I 4.0	**MATH 5620 (4.0)** *Even* Numerical Analysis II / **ECE 5520 (3.0)** *Odd* Dig. Comm. Systems		**ECE 6331** Optics for Energy 3.0
11 Credits	**11-12 Credits**		**9 Credits**
			Total Credits: 33-34

Required	Advanced ECE	Allied	Final Exam Option

Department of ELECTRICAL & COMPUTER ENGINEERING
THE UNIVERSITY OF UTAH

MS Electrical Engineering Solid State / MEMS

MS Degree Requirements

- 2 hours of Graduate Seminar (ECE 6900/6910)
- 32+ hours of graduate coursework
  - 18+ hours of ECE courses at 6000- or 7000-level
  - Up to 12 hours of allied graduate courses
- Coursework / Project Final Exam Requirement

This is a sample Program of Study for an MS Electrical Engineering student that meets the requirements for both the Coursework and Project option. Students who choose a thesis should meet with a graduate advisor to create an individualized plan.

Final Exam Options

Coursework
Students must receive a B or higher in one of the approved courses to meet the Final Exam Requirement.

Project
Up to 6 credits of ECE 6950 – Special Study can count for industry or on-campus research. Students may enroll in ECE 6950 one or more times during Spring, Summer, and/or Fall semesters.

Other Recommended Courses

Fall Semester
ECE 6226 – Electrical Interfaces for MEMS (3.0) *Periodic*
ECE 6273 – Solid State Memory Devices (3.0) *Odd Years*
MST 6200 – Professional Dev. for Scientists & Engineers (3.0)
ENGIN 6020 – Emerging Tech & Engineering Entrepreneurship (3.0)

Spring Semester
ECE 6233 – Microactuators (4.0) *Even Years, 6221 is a pre-req*
ECE 6235 – Nano-Electro Mech. Systems / NEMS (3.0) *Periodic*
COMP 5360 – Introduction to Data Science (3.0)
MST 6210 – Operations & Project Management (3.0)
ENGIN 6030 – Patent Law & Strategy (3.0)

Year 1		Optional	Year 2
Fall	**Spring**	**Summer**	**Fall**
ECE 6900 Graduate Seminar I — 1.0	**ECE 6910** Graduate Seminar II — 1.0	**ECE 6950** Special Study (Project Option Only) — 3-6.0	**ECE 6330** Health Technology — 3.0
ECE 6221 Micromachining w/ lab — 3.0 Fall & Spring	**ECE 6960** Biomedical Micro Devices — 3.0		**ECE 6261 (3.0)** *Even* Phys. Theory SC Device / **ECE 6231 (3.0)** *Odd* Microsensors
ECE 6231 (3.0) *Odd* Microsensors / **ECE 6261 (3.0)** *Even* Phys. Theory SC Device	**ECE 6225** Microsystems Design and Characterization — 3.0		**ECE 6654 (3.0)** NeuroEng. & NeuroRob. / **ECE 6255 (3.0)** *Odd* eMicroscopy for SMD
ECE 6255 (3.0) *Odd* eMicroscopy for SMD / **ECE 6654 (3.0)** NeuroEng. & NeuroRob.	**ECE 6250** Introduction to Quantum Computers — 3.0		**COMP 5190** Foundations of Data Analysis — 3.0
10 Credits	**10 Credits**		**12 Credits**
			Total Credits: 32

Legend:
- Required
- Advanced ECE
- Allied
- Final Exam Option