

Chương trình đào tạo hệ thống điện

1 Các nhánh đào tạo liên quan đến Hệ thống điện,

1.1 US và Canada

Nhìn chung, các trường ĐH quốc tế đào tạo ngành chính là EE (Electrical Engineering), hoặc ECE (Electrical and Computer Engineering). Các trường có thể cho phép sinh viên lựa chọn các nhánh (track). Ví dụ như cấu trúc chương trình của North Carolina State university:

https://www.ece.ncsu.edu/undergraduate/ece_majors

Bảng 1 Một số nhánh đào tạo (track) trong EE liên quan đến ngành HTĐ trong các trường ĐH ở Mỹ, theo điều tra PEEC, Mỹ, 2014.

Tên nhánh	Trường Đại học	Ghi chú
Smart grid	State university of Newyork	B.Sc, technical elective
Sustainable and renewable Energy engineering	Carleton university	
Power system control	Drexel university	B.Eng, specialization elective
Sustainable energy concentration	Lake superior state university	
Concentration in Electrical Energy Engineering	Lawrence technological university	
Enhance Power Engineering concentration	McGill university	
Electric power emphasis	Missouri university of Science and technology	
Power Energy control	Montana State university	
Power systems	Newjersey Institute of Technology	
Renewable Electric Energy Concentration	North Carolina State university	
Alternative Energy	United States Military academy	
Power systems with solar power plants	University of California (LA)	
Distributed Technology and Smart grid	U. of Central Florida	
Power Emphasis	U. of Idaho	
Power systems	U. of Maryland College park	
Power and Energy Systems	U. of Nebraska – Lincoln	B.S in Electrical Engineering
Energy System Engineering	U. of Toronto	
Energy system Track	U. of Vermont	
Large Scale Power systems Sustainable Energy Power Electronics and Drives	U. of Washington	BSc. Concentration
Electric Energy Systems	Vilanova University	
Power engineering	Washington State Univeristy	Bachelor ECE, major

Bên cạnh đó, một số trường ĐH cấp certificate cho các lĩnh vực liên quan đến ngành HTĐ.

Bảng 2 Một số trường ĐH có certificate liên quan đến HTĐ, theo điều tra PEEC, Mỹ, 2014.

Tên nhánh	Trường Đại học	Ghi chú
Undergrad. Concentration in Power Engineering	Clarkson University	
Power system engineering	Iowa State University	Graduate
Renewable Energy	Minesota State University	
Electric power system Engineering	Missouri U. of Science and Technology	
Renewable Electric Energy	North Carolina State University	Graduate
Power Engineering certificate	Rose Hulman Institute of Tech.	
Renewable Energy	Santa Clara U.	
Electrical power installation	U. of California (LA)	
Power and Energy	U. of Kentucky	
Renewable Energy	U. of Nevada	Graduate
Power and Energy Systems	U. of Tennessee	

1.2 Đại học Thanh Hoa, Trung Quốc

Bảng 3 Chương trình ĐH và SDH ngành điện, ĐH Thanh Hoa.

<p>Tsinghua university, undergraduate http://www.eea.tsinghua.edu.cn/publish/eeaen/1206/index.html</p>	<p>The Department of Electrical Engineering grants <i>Bachelor Degree for Electrical Engineering</i> and Its Automation for the four-year undergraduate program. 175 credits are required to complete the program. Practice training courses are implemented in the summer term and others are in the ordinary semesters. The average credit per semester is about 20, i.e. students take four hours of lectures per workday.</p> <p>The courses can be classified into five different categories: math courses, physics courses, general engineering courses, general discipline courses, and practice courses. General engineering courses are defined as the courses suitable for most engineering disciplines, especially electrical-related disciplines. General discipline courses are set up based on the fields under the Electrical Engineering Discipline.</p> <p>The main natural science and general engineering courses are given in the first two year of the program, which provides sufficient time for general discipline courses and specialized courses.</p> <p>The Department hopes that undergraduate students could understand the most important topics for each field, master the techniques and ideas for solving problems in each field, and grasp the experiment skills for each field through the corresponding general discipline course. <i>Four general discipline courses, i.e. Electric Machinery Fundamentals, Fundamentals of Power Electronics, Power System Analysis, and High Voltage Engineering, form the core of the undergraduate program.</i></p> <p>All the specialized courses are elective. Students can develop their academic career according to their interests and suggestions given by advisors by selecting a total of 20 credits.</p>
<p>Tsinghua university, graduate http://www.eea.tsinghua.edu.cn/publish/eeaen/1207/index.html</p>	<p>24 credits are required for the degree courses of research-oriented master students. The distribution of the credits is illustrated in Fig. 2.11. The electrical engineering specialized courses offered by the Department are displayed by Fig. 2.12, <i>where courses are divided into four groups, i.e. general purpose, power systems, high voltage, and electric machinery and power electronic</i></p>

1.3 Đại học Warsaw, Baland

Chương trình Bachelor in Power engineering

<http://www.students.pw.edu.pl/PDF/B.Sc.%20Power%20Engineering.pdf>

1.4 Đại học Xian Jiao Tong (Trung Quốc):

Link: <http://en.xjtu.edu.cn/info/1005/1519.htm>

4 chương trình undergrad:

- Energy and Power Engineering
- Renewable Energy Science and Engineering
- Nuclear Engineering and Technology

1.5 Đại học North China Electric Power university

Bachelor's Programs: <http://english.ncepu.edu.cn/jyyj/29785.html>

- Electrical Engineering and its Automation (Key discipline – National level)
- Smart Grid Information Engineering
- Nuclear Engineering & Nuclear Technology

1.6 Ecole polytechnique Federal de Lausanne (EPFL – Thụy Sĩ)

Link: <http://sti.epfl.ch/page-1557-en.html>

Bachelor : Electrical Engineering với 03 majors:

- Electronics and microelectronics:
- Information technologies:
- Power and Energy: Production, transport, conversion and usage of electrical energy; fuel cells, energy storage, micromotors and electrical machines.

1.7 Imperial College of London – UK

Tên chương trình: BEng Electrical and Electronic Engineering

Link: <http://www.imperial.ac.uk/study/ug/courses/electrical-engineering-department/electrical-and-electronic-engineering-beng/>

Các định hướng sâu của năm thứ 3:

Group 1: You choose four modules from below.

- Analogue Integrated Circuits and Systems
- Artificial Intelligence
- Biomedical Electronics
- Communication Networks
- Communication Systems
- Control Engineering
- Digital Signal Processing
- **Electrical Energy Systems**
- Mathematics for Signals and Systems
- Microwave Technology
- Optoelectronics

Group 2: You choose two modules from below.

- Advanced Electronic Devices
- Advanced Signal Processing
- Digital System Design
- Embedded Systems
- High Level Programming
- Instrumentation
- Introduction to Machine Learning
- Power Electronics
- Real-time Digital Signal Processing

1.8 RWTHAACHEN university (post graduate) – Đức:

Các mô đun của chương trình sau ĐH về **Electrical Power Engineering**:

<http://www.elektrotechnik.rwth-aachen.de/cms/Elektrotechnik-und-Informationstechnik/Studium/Master-Studiengaenge/Master-of->

- High Voltage Engineering - Testing Systems and Diagnostics (Module 8101)
- High Voltage Engineering - Insulation Systems (Module 8102)
- Battery Storage Systems (Module 8103)
- Electrical Machines 1 (Module 8104)
- Faults and Stability in Power Systems (Module 8105)
- Electrical Drives (Module 8106)
- Power Electronics – Control, Synthesis and Applications (Module 8107)
- Power System Dynamics (Module 8108)
- Automation of Complex Power Systems (Module 8109)
- Modeling and Simulation of Complex Power Systems (Module 8110)
- Electrical Machines 2 (Module 8111)

2 Các môn học ngành Hệ thống điện

2.1 US và Canada

Bảng 4 Các môn học HTĐ, theo điều tra PEEC, Mỹ, 2014.

UNIVERSITY	LEVEL	TITLE	TYPE	CR HRS	LAB
Arizona State Univ.	Graduate	Power System Transients	Elective	3	No
Arizona State Univ.	Graduate	Power System Operation and Control	Elective	3	No
Arizona State Univ.	Graduate	Electric Power Quality	Elective	3	No
Arizona State Univ.	Graduate	Transmission and Distribution	Elective	3	No
Arizona State Univ.	Graduate	Advanced Power Electronics	Elective	3	No
Arizona State Univ.	Graduate	Power System Stability and Control	Elective	3	No
Arizona State Univ.	Graduate	Power Engineering Seminar	Mandatory	1	No
Arizona State Univ.	Graduate	Renewable Resources	Elective	3	No
Arizona State Univ.	Graduate	Computer Simulation of power systems	Elective	3	No
Arizona State Univ.	Undergrad	Electronic Power Devices	Elective	3	No
Arizona State Univ.	Undergrad	Electric Power System Analysis	Elective	3	No
Arizona State Univ.	Undergrad	Electric Machines	Elective	3	No
Arizona State Univ.	Undergrad	Electric Power Plants	Elective	3	No
Arizona State Univ.	Undergrad	Power and Energy Engineering	Mandatory	4	Yes
Auburn Univ.	Graduate	Power System Transients	Elective	3	No
Auburn Univ.	Graduate	Electric Machines	Elective	3	No
Auburn Univ.	Graduate	Power System Operation	Elective	3	No
Auburn Univ.	Graduate	Power Electronics	Elective	3	No
Auburn Univ.	Graduate	Power System Protection	Elective	3	No
Auburn Univ.	Graduate	Advanced Electric Machines	Elective	3	No
Auburn Univ.	Graduate	Power System Analysis	Elective	3	No
Auburn Univ.	Graduate	Power System Dynamics & Stability	Elective	3	No
Auburn Univ.	Undergrad	Electric Machines	Elective	3	No
Auburn Univ.	Undergrad	Power Electronics	Elective	3	No
Auburn Univ.	Undergrad	Power System Protection	Elective	3	No
Auburn Univ.	Undergrad	Electric Power Engineering	Mandatory	3	No
Auburn Univ.	Undergrad	Power System Analysis	Elective	3	No
Baylor Univ.	Graduate	Power System Operation	Elective	3	No
Baylor Univ.	Graduate	Smart Grid Integration	Elective	3	No
Baylor Univ.	Graduate	Power System Control	Elective	3	No
Baylor Univ.	Undergrad	Renewable Energy	Elective	3	No
Baylor Univ.	Undergrad	Power Systems	Elective	3	No
Baylor Univ.	Undergrad	Power Electronics	Elective	3	Yes
Boise State Univ.	Graduate	Electric Machines	Elective	3	No
Boise State Univ.	Graduate	Power Electronics	Elective	3	No
Boise State Univ.	Graduate	Power System Analysis I	Elective	3	No
Boise State Univ.	Undergrad	Power System Analysis I	Elective	3	No
Boise State Univ.	Undergrad	Electrical Machines	Elective	3	No
Boise State Univ.	Undergrad	Power System Analysis II	Elective	3	No
Boise State Univ.	Undergrad	Power Electronics	Elective	3	No
Boise State Univ.	Graduate	Power System Analysis II	Elective	3	Yes
Bucknell Univ.	Undergrad	Sustainable Energy Systems	Elective	1	No
Bucknell Univ.	Graduate	Electrical Engineering Independent Study - Smart Grid	Elective	1	Yes
Bucknell Univ.	Undergrad	Electrical Energy Conversion: Devices and systems	Mandatory	1	Yes

Buffalo State - State Univ. of New York	Graduate	Power Systems Analysis I	Elective	3	Yes
Buffalo State - State Univ. of New York	Graduate	Power Systems Analysis II	Elective	3	Yes
Buffalo State - State Univ. of New York	Undergrad	Power Electronics	Mandatory	3	Yes
Buffalo State - State Univ. of New York	Undergrad	Power Systems I	Mandatory	3	Yes
Buffalo State - State Univ. of New York	Undergrad	Electric Machines	Mandatory	3	Yes
Buffalo State - State Univ. of New York	Undergrad	Power Systems II	Mandatory	3	Yes
California State Polytechnic Univ., Pomona	Graduate	Smart Grid	Elective	3*	No
California State Polytechnic Univ., Pomona	Graduate	Advanced Power System Analysis	Elective	3*	No
California State Polytechnic Univ., Pomona	Graduate	Advanced Topics in Power Electronics	Elective	4*	No
California State Polytechnic Univ., Pomona	Graduate	Power System Design	Elective	4*	No
California State Polytechnic Univ., Pomona	Undergrad	Power System Electronics	Elective	3*	Yes
California State Polytechnic Univ., Pomona	Undergrad	Power Transmission Line Analysis	Elective	3*	Yes
California State Polytechnic Univ., Pomona	Undergrad	Power Electronics	Elective	3*	Yes
California State Polytechnic Univ., Pomona	Undergrad	Introduction to Power Engineering	Mandatory	4*	Yes
California State Polytechnic Univ., Pomona	Undergrad	Power System Analysis	Elective	3*	Yes
California State Polytechnic Univ., San Luis Obispo	Graduate	Electric Machines Theory	Elective	4*	No
California State Polytechnic Univ., San Luis Obispo	Graduate	Solar Photovoltaic Systems Design	Elective	4*	No
California State Polytechnic Univ., San Luis Obispo	Undergrad	Power Systems Analysis II	Elective	4*	No
California State Polytechnic Univ., San Luis Obispo	Undergrad	Alternating Current Machines	Elective	6*	Yes
California State Polytechnic Univ., San Luis Obispo	Undergrad	Power Systems Laboratory	Elective	3*	No
California State Polytechnic Univ., San Luis Obispo	Undergrad	Power Electronics I	Elective	6*	Yes
California State Polytechnic Univ., San Luis Obispo	Undergrad	Energy Conversion Electromagnetics	Mandatory	3*	No

California State Polytechnic Univ., San Luis Obispo	Undergrad	Sustainable Electric Energy Conversion	Elective	6*	Yes
California State Polytechnic Univ., San Luis Obispo	Undergrad	Power Systems Analysis I	Elective	4*	No
California State Polytechnic Univ., San Luis Obispo	Undergrad	Power Electronics II	Elective	6*	Yes
California State Polytechnic Univ., San Luis Obispo	Undergrad	Energy Conversion Electromagnetics Laboratory	Mandatory	3*	Yes
California State Polytechnic Univ., San Luis Obispo	Undergrad	Introduction to Magnetic Design	Elective	6*	Yes
California State Univ., Northridge	Graduate	Power Transmission Lines	Elective	3	No
California State Univ., Northridge	Graduate	Short Circuit Analysis	Elective	3	No
California State Univ., Northridge	Graduate	Power Electronics	Elective	3	Yes
California State Univ., Northridge	Graduate	Protective Relaying	Elective	3	No
California State Univ., Northridge	Graduate	Power Distribution	Elective	3	No
California State Univ., Northridge	Undergrad	Electrical Machines and Energy Conversion	Elective	4	Yes
California State Univ., Northridge	Undergrad	Power Transmission Lines	Elective	3	No
California State Univ., Northridge	Undergrad	Power Electronics	Elective	3	Yes
Carleton Univ.	Graduate	Renewable and Distributed Energy Resource Technologies	Elective	36	No
Carleton Univ.	Undergrad	Power Electronics	Elective	72	Yes
Carleton Univ.	Undergrad	Sustainable Energy Systems Design	Mandatory	72	Yes
Carleton Univ.	Undergrad	Electrical Power Engineering	Elective	72	Yes
Carleton Univ.	Undergrad	Energy Distribution and Efficient Utilization	Mandatory	72	Yes
Carnegie Mellon Univ.	Graduate	Power Electronics for Electric Power Systems	Elective	12	No
Carnegie Mellon Univ.	Graduate	Introduction to Solar Arrays: Modeling,	Elective	12	Yes
Carnegie Mellon Univ.	Graduate	Optimization in Electric Energy Systems	Elective	12	No
Carnegie Mellon Univ.	Graduate	Smart Grids and Future Electric Energy Systems	Elective	12	No
Carnegie Mellon Univ.	Graduate	Large Scale Dynamic Systems	Elective	12	No
Carnegie Mellon Univ.	Undergrad	Electric Energy Processing: Fundamentals and	Elective	12	No
Carnegie Mellon Univ.	Undergrad	Electrical Energy Conversion, Control and Management (Capstone	Elective	12	Yes
Carnegie Mellon Univ.	Undergrad	Fundamentals in Electric Power Systems	Elective	12	No
Carnegie Mellon Univ.	Undergrad	Computational Methods in Smart Grids	Elective	12	No
Case Western Reserve Univ.	Graduate	Smart Grid	Elective	3	No
Case Western Reserve Univ.	Graduate	Power System Analysis I	Elective	3	No
Case Western Reserve Univ.	Graduate	Power System Analysis II	Elective	3	No

Case Western Reserve Univ.	Undergrad	Power System Analysis II	Elective	3	No
Case Western Reserve Univ.	Undergrad	Smart Grid	Elective	3	No
Case Western Reserve Univ.	Undergrad	Power System Analysis I	Elective	3	No
Clarkson Univ.	Graduate	Power System Protection	Elective	3	No
Clarkson Univ.	Graduate	Market Operation of Power Systems	Elective	3	No
Clarkson Univ.	Graduate	High Voltage Techniques and Measurements	Elective	3	No
Clarkson Univ.	Graduate	Power System Planning	Elective	3	No
Clarkson Univ.	Graduate	Alternate Energy Systems	Elective	3	No
Clarkson Univ.	Graduate	Dielectrics	Elective	3	No
Clarkson Univ.	Graduate	Advanced Electric Machines and Drives	Elective	3	No
Clarkson Univ.	Undergrad	Dielectrics	Elective	3	No
Clarkson Univ.	Undergrad	High Voltage Techniques and Measurements	Elective	3	No
Clarkson Univ.	Undergrad	Power Systems Engineering	Elective	3	No
Clarkson Univ.	Undergrad	Alternate Energy Systems	Elective	3	No
Clarkson Univ.	Undergrad	Power Transmission and Distribution	Elective	3	No
Clarkson Univ.	Undergrad	Energy Conversion	Mandatory	3	No
Clemson Univ.	Graduate	Electric Machines and Drives	Elective	3	No
Clemson Univ.	Graduate	Electric Motor Control	Elective	3	No
Clemson Univ.	Graduate	Computer Methods for Power System Analysis	Elective	3	No
Clemson Univ.	Undergrad	Renewable Energy and Electric Vehicles	Elective	3	No
Clemson Univ.	Undergrad	Electric Power Engineering	Mandatory	3	No
Cleveland State Univ.	Graduate	Power Systems	Mandatory	4	No
Cleveland State Univ.	Graduate	Power Systems Control	Elective	4	No
Cleveland State Univ.	Graduate	Power Electronics II	Mandatory	4	No
Cleveland State Univ.	Graduate	Power Electronics and Electric Machines	Elective	4	No
Cleveland State Univ.	Graduate	Power Systems Operations	Elective	4	No
Cleveland State Univ.	Undergrad	Electromechanical Energy Conversion	Mandatory	3	No
Cleveland State Univ.	Undergrad	Power Electronics	Mandatory	3	Yes
Colorado School of Mines	Graduate	High Voltage AC and DC Power Transmission	Elective	3	No
Colorado School of Mines	Graduate	Power Quality	Elective	3	No
Colorado School of Mines	Graduate	Advanced High Power Electronics	Elective	3	No
Colorado School of Mines	Graduate	Renewable Energy and Distributed Generation	Elective	3	No
Colorado School of Mines	Graduate	Advanced Electrical Machine Dynamics	Elective	3	No
Colorado School of Mines	Graduate	Power System Operation and Management	Elective	3	No
Colorado School of Mines	Graduate	Modern Adjustable Speed Electric Drives	Elective	3	No
Colorado School of Mines	Graduate	Power Distribution Systems Engineering	Elective	3	No
Colorado School of Mines	Graduate	Design and Control of Wind Energy System	Elective	3	No
Colorado School of Mines	Graduate	Communication Networks for Power	Elective	3	No

Colorado School of Mines	Graduate	Power Grid and Natural Disasters	Elective	3	No
Colorado School of Mines	Undergrad	Power System Analysis	Elective	3	No
Colorado School of Mines	Undergrad	Introduction to High Power Electronics	Elective	3	No
Colorado School of Mines	Undergrad	Fundamentals of Electric Machinery	Mandatory	4	Yes
Colorado School of Mines	Undergrad	Analysis and Design of Advanced Energy Systems	Elective	3	Yes
Colorado School of Mines	Undergrad	Analysis and Design of Advanced Energy Systems	Elective	3	No
Colorado School of Mines	Undergrad	Computational Methods in Energy Systems and	Elective	3	Yes
Colorado State Univ.	Graduate	Grid Integration of Wind Energy Systems	Elective	3	No
Colorado State Univ.	Graduate	Electric Power Quality	Elective	3	No
Colorado State Univ.	Graduate	Power Electronics II	Elective	3	No
Colorado State Univ.	Graduate	Electric Power Engineering	Elective	3	No
Colorado State Univ.	Graduate	Signal Processing For Power Systems II	Elective	3	No
Colorado State Univ.	Graduate	Introduction to Electric Power Markets	Elective	3	No
Colorado State Univ.	Graduate	Signal Processing For Power Systems I	Elective	3	No
Colorado State Univ.	Graduate	Power Electronics I	Elective	3	No
Colorado State Univ.	Undergrad	Electrical Energy Generation Technologies	Elective	3	No
Colorado State Univ.	Undergrad	Power Systems I	Elective	3	Yes
Concordia Univ.	Graduate	Power Electronics I	Mandatory	4*	Yes
Concordia Univ.	Graduate	Design of Power Electronic Circuits	Elective	4*	Yes
Concordia Univ.	Graduate	Computer-aided Analysis of Power Electronic	Elective	4*	Yes
Concordia Univ.	Graduate	Power System Compensation	Elective	4*	Yes
Concordia Univ.	Graduate	Controlled Electric Drives	Elective	4*	Yes
Concordia Univ.	Graduate	Power Electronics II	Elective	4*	Yes
Concordia Univ.	Undergrad	Control of Electrical Power Conversion	Mandatory	4*	Yes
Concordia Univ.	Undergrad	Fundamentals of Electrical Power	Mandatory	4*	Yes
Concordia Univ.	Undergrad	Electrical Engineering Project	Mandatory	4*	Yes
Concordia Univ.	Undergrad	Electrical Power Systems	Mandatory	4*	Yes
Concordia Univ.	Undergrad	Power Electronics	Elective	4*	Yes
Cornell Univ.	Graduate	Advanced Power Systems	Elective	4	No
Cornell Univ.	Undergrad	Power Systems I	Elective	4	No
Cornell Univ.	Undergrad	Advanced Power Systems	Elective	4	No
Drexel Univ.	Graduate	Power Electronic Applications	Elective	3*	Yes
Drexel Univ.	Graduate	Power System Dynamics	Elective	3*	No
Drexel Univ.	Graduate	Protective Relaying	Elective	3*	Yes
Drexel Univ.	Graduate	Computer Analysis of Power Systems	Elective	3*	No
Drexel Univ.	Graduate	AC-DC/DC-AC Power Electronic Converters	Elective	3*	Yes
Drexel Univ.	Graduate	Power Distribution Automation and Control	Elective	3*	Yes
Drexel Univ.	Graduate	Power System Security	Elective	3*	No
Drexel Univ.	Graduate	Protective Relay Laboratory	Elective	3*	Yes
Drexel Univ.	Graduate	Synchronous Machine Modeling	Elective	3*	No

Drexel Univ.	Graduate	Power Electronic Experiments	Elective	3*	Yes
Drexel Univ.	Graduate	Service and Power Quality in Distribution	Elective	3*	Yes
Drexel Univ.	Graduate	Economic Operation of Power Systems	Elective	3*	No
Drexel Univ.	Graduate	Power System Analysis	Elective	3*	No
Drexel Univ.	Graduate	Solid State Protect Relay	Elective	3*	Yes
Drexel Univ.	Graduate	Modeling and Analysis Power Distribution	Elective	3*	Yes
Drexel Univ.	Undergrad	Special Topics: Introduction to	Elective	3*	No
Drexel Univ.	Undergrad	Power Systems II	Mandatory	4*	Yes
Drexel Univ.	Undergrad	Power Distribution Automation and Control	Elective	3*	Yes
Drexel Univ.	Undergrad	Experimental Study of Power Electronic	Elective	3*	Yes
Drexel Univ.	Undergrad	Electric Motor Control Principles	Mandatory	4*	Yes
Drexel Univ.	Undergrad	Solar Energy Engineering	Elective	3*	No
Drexel Univ.	Undergrad	Energy Management Principles	Elective	4*	Yes
Drexel Univ.	Undergrad	Power Systems III	Mandatory	3*	No
Drexel Univ.	Undergrad	Service and Power Quality Distribution	Elective	3*	Yes
Drexel Univ.	Undergrad	Applications of Power Electronic Converters	Elective	3*	Yes
Drexel Univ.	Undergrad	Power Systems I	Mandatory	3*	No
Drexel Univ.	Undergrad	Modeling and Analysis of Electric Power Distribution Systems	Elective	3*	Yes
Drexel Univ.	Undergrad	Power Electronic Converter Fundamentals	Elective	3*	Yes
FAMU-FSU College of Engineering	Graduate	Protective Relaying	Elective	3	No
FAMU-FSU College of Engineering	Graduate	Power Systems Analysis	Elective	3	No
FAMU-FSU College of Engineering	Graduate	Power Systems Operation and Control	Elective	3	No
FAMU-FSU College of Engineering	Graduate	Power Conversion and Control	Elective	3	No
FAMU-FSU College of Engineering	Graduate	Power Electronics	Elective	3	No
FAMU-FSU College of Engineering	Graduate	Power Systems Transients	Elective	3	No
FAMU-FSU College of Engineering	Undergrad	Power Systems Lab	Elective	1	Yes
FAMU-FSU College of Engineering	Undergrad	Converter Modeling and Control	Elective	3	No
FAMU-FSU College of Engineering	Undergrad	Power Systems I	Elective	3	No
FAMU-FSU College of Engineering	Undergrad	Power Electronics	Elective	3	No
FAMU-FSU College of Engineering	Undergrad	Fundamentals of Power Systems	Elective	3	No
FAMU-FSU College of Engineering	Undergrad	Electromechanical Dynamics	Elective	3	No
FAMU-FSU College of Engineering	Undergrad	Power Conversion and Control	Elective	3	No
Florida International Univ.	Graduate	Renewable Energy Utilization	Elective	3	Yes
Florida International Univ.	Graduate	Electric Drives	Elective	3	No
Florida International Univ.	Graduate	Intelligent Systems Applications in Power	Elective	3	No

Florida International Univ.	Graduate	Power System Protection	Elective	3	No
Florida International Univ.	Graduate	Power System Stability and Control	Elective	3	No
Florida International Univ.	Graduate	Power Quality	Elective	3	No
Florida International Univ.	Graduate	Electric Transients in Power Systems	Elective	3	No
Florida International Univ.	Graduate	Power System Engineering	Elective	3	No
Florida International Univ.	Undergrad	Power Systems II (EEL 4214)	Elective	3	No
Florida International Univ.	Undergrad	Power Systems III (EEL 4215)	Elective	3	No
Florida International Univ.	Undergrad	Power Electronics (EEL 4241)	Elective	3	Yes
Florida International Univ.	Undergrad	Power Systems I (EEL 4213)	Mandatory	3	Yes
Gannon Univ.	Graduate	AC Drives	Elective	3	No
Gannon Univ.	Graduate	Electric Machine Design	Elective	3	No
Gannon Univ.	Graduate	Modelling and Analysis of Electric Drives	Elective	3	No
Gannon Univ.	Graduate	Integrating Renewable Energy Into Electrical Power Systems	Elective	3	No
Gannon Univ.	Undergrad	Integrating Renewable Energy Into Electrical Power Systems	Elective	3	No
Gannon Univ.	Undergrad	Introduction to Electric Drives	Mandatory	3	Yes
Gannon Univ.	Undergrad	Power System Analysis	Elective	3	No
Georgia Institute of Technology	Graduate	Power Electronic Circuits	Elective	3	No
Georgia Institute of Technology	Graduate	Power Systems Control and Operation	Elective	3	No
Georgia Institute of Technology	Graduate	Dynamics and Control of Electric Machine Drives	Elective	3	No
Georgia Institute of Technology	Graduate	Power System Protection	Elective	3	No
Georgia Institute of Technology	Graduate	Power Electronics CAD Laboratory	Elective	1	No
Georgia Institute of Technology	Graduate	Power System Stability	Elective	3	No
Georgia Institute of Technology	Graduate	Electric Power Quality	Elective	3	No
Georgia Institute of Technology	Graduate	Power Electronic Devices and Subsystems	Elective	3	No
Georgia Institute of Technology	Graduate	Electric Machinery Analysis	Elective	3	No
Georgia Institute of Technology	Graduate	Power System Planning and Reliability	Elective	3	No
Georgia Institute of Technology	Undergrad	Power System Engineering	Elective	3	No
Georgia Institute of Technology	Undergrad	Electric Machinery Analysis	Elective	3	No
Georgia Institute of Technology	Undergrad	Energy Conversion and Mechatronics	Elective	2	No
Georgia Institute of Technology	Undergrad	Electric Power Quality	Elective	3	No
Georgia Institute of Technology	Undergrad	Building Electrical Systems and Illumination	Elective	3	No
Georgia Institute of Technology	Undergrad	Power System Analysis and Control	Elective	3	No

Georgia Institute of Technology	Undergrad	Power Electronics	Elective	3	No
Georgia Institute of Technology	Undergrad	Electromechanical and Electromagnetic Energy Conversion	Elective	3	No
Georgia Institute of Technology	Undergrad	Electric Energy Systems	Mandatory	3	Yes
Gonzaga Univ.	Graduate	Electrical Grid Operations	Mandatory	3	No
Gonzaga Univ.	Graduate	Underground System Design	Mandatory	3	No
Gonzaga Univ.	Graduate	Electrical Distribution System Design	Mandatory	3	No
Gonzaga Univ.	Graduate	Engineering Leadership	Mandatory	3	Yes
Gonzaga Univ.	Graduate	Transmission Line Design - Advanced	Elective	3	No
Gonzaga Univ.	Graduate	Project Development and Construction Methods	Mandatory	3	No
Gonzaga Univ.	Graduate	Transmission Line Design - Electrical Aspects	Mandatory	3	No
Gonzaga Univ.	Graduate	Substation Design	Mandatory	3	No
Gonzaga Univ.	Graduate	Power System Analysis	Mandatory	3	No
Gonzaga Univ.	Graduate	Transmission Line Design - Special Topics	Elective	3	No
Gonzaga Univ.	Graduate	System Protection	Mandatory	3	No
Gonzaga Univ.	Graduate	Transmission Line Design - Introduction	Mandatory	3	No
Gonzaga Univ.	Graduate	System Automation	Mandatory	3	No
Gonzaga Univ.	Undergrad	Introduction to Electric Power Engineering	Mandatory	4	Yes
Gonzaga Univ.	Undergrad	Power Systems Analysis	Elective	3	No
Gonzaga Univ.	Undergrad	Electric Power Distribution System	Elective	3	No
Gonzaga Univ.	Undergrad	Special Topics - Protective Relaying	Elective	3	No
Howard Univ.	Graduate	Power Communication and Control	Mandatory	3	Yes
Howard Univ.	Graduate	Optimization Theory and Application	Mandatory	3	No
Howard Univ.	Graduate	Computer and Safety Critical System	Mandatory	3	Yes
Howard Univ.	Graduate	Energy Processing and Smart Grid	Mandatory	3	Yes
Howard Univ.	Undergrad	Energy Processing and Smart Grid	Mandatory	3	Yes
Howard Univ.	Undergrad	Power System Analysis	Elective	3	Yes
Howard Univ.	Undergrad	Power Communication and Control	Elective	3	Yes
Howard Univ.	Undergrad	Energy Conversion	Mandatory	5	Yes
Illinois Institute of Technology	Graduate	Elements of Sustainable Energy	Elective	3	No
Illinois Institute of Technology	Graduate	Power Market Operations	Elective	3	No
Illinois Institute of Technology	Graduate	Power System Reliability	Elective	3	No
Illinois Institute of Technology	Graduate	Power System Transaction Management	Elective	3	No
Illinois Institute of Technology	Graduate	Power System Planning	Elective	3	No
Illinois Institute of Technology	Graduate	Elements of Smart Grid	Elective	3	No
Illinois Institute of Technology	Graduate	Power Market Economics and Security	Elective	3	No
Illinois Institute of Technology	Graduate	Power Systems Dynamics and Stability	Elective	3	No
Illinois Institute of Technology	Graduate	Control and Operation of Electric Power Systems	Elective	3	No
Illinois Institute of Technology	Graduate	Power System Relaying	Elective	3	No
Illinois Institute of Technology	Graduate	Microgrid Design and Operation	Elective	3	No

Illinois Institute of Technology	Graduate	Fault-Tolerant Power Systems	Elective	3	No
Illinois Institute of Technology	Graduate	Deregulated Power Systems	Elective	3	No
Illinois Institute of Technology	Undergrad	Power System Analysis	Elective	4	Yes
Illinois Institute of Technology	Undergrad	Fundamentals of Power Engineering	Mandatory	4	Yes
Illinois Institute of Technology	Undergrad	Analytical Methods in Power Systems	Elective	3	No
Illinois Institute of Technology	Undergrad	Power Distribution Engineering	Elective	3	No
Indiana Univ. - Purdue Univ. Indianapolis	Graduate	Computational Methods for Power System Analysis	Elective	3	No
Indiana Univ. - Purdue Univ. Indianapolis	Graduate	Energy Conversion	Elective	3	No
Indiana Univ. - Purdue Univ. Indianapolis	Undergrad	Electromechanical Motion Devices	Elective	3	No
Indiana Univ. - Purdue Univ. Indianapolis	Undergrad	Elements of Power System Engineering	Elective	3	No
Iowa State Univ.	Graduate	Reliability Evaluation of Electric Power Systems	Elective	3	No
Iowa State Univ.	Graduate	Wind Energy Resources	Elective	3	No
Iowa State Univ.	Graduate	Electromechanical Wind Energy Conversion and Grid Integration	Elective	3	No
Iowa State Univ.	Graduate	Power System Dynamics	Mandatory	3	No
Iowa State Univ.	Graduate	Electromechanical Energy Conversion Systems	Elective	3	No
Iowa State Univ.	Graduate	Wind Energy Systems	Elective	3	No
Iowa State Univ.	Graduate	Voltage Stability Assessment and Control	Elective	3	No
Iowa State Univ.	Graduate	Seminar in Electric Power	Mandatory	1	No
Iowa State Univ.	Graduate	Energy System Planning	Elective	3	No
Iowa State Univ.	Graduate	Wind Energy System Design	Elective	3	No
Iowa State Univ.	Graduate	Steady State Analysis	Mandatory	3	No
Iowa State Univ.	Undergrad	Power System Analysis II	Elective	3	No
Iowa State Univ.	Undergrad	Economic Systems for Electric Power Planning	Elective	3	No
Iowa State Univ.	Undergrad	Electrical Machines and Power Electronic Drives	Elective	3	Yes
Iowa State Univ.	Undergrad	Electromechanical Wind Energy Conversion and Grid Integration	Elective	3	No
Iowa State Univ.	Undergrad	Energy Systems and Power Electronics	Mandatory	3	No
Iowa State Univ.	Undergrad	Power System Analysis I	Elective	3	No
Iowa State Univ.	Undergrad	Introduction to Energy Distribution Systems	Elective	3	No
Iowa State Univ.	Undergrad	Introduction to Wind Energy: System Design &	Elective	3	No
John Brown Univ.	Undergrad	Power Systems	Elective	3	No
Johns Hopkins Univ.	Graduate	Energy Markets in the Middle East and Central	Elective	3	No
Johns Hopkins Univ.	Graduate	Energy Systems Analysis	Elective	3	No
Johns Hopkins Univ.	Graduate	Risk and Decision Analysis	Elective	3	No
Johns Hopkins Univ.	Graduate	Energy Policy and Planning Models	Elective	3	No
Johns Hopkins Univ.	Graduate	Photovoltaics and Energy Devices	Elective	3	No
Johns Hopkins Univ.	Undergrad	Energy Resources in the Modern World	Elective	3	No
Johns Hopkins Univ.	Undergrad	Renewable Energy Engineering	Elective	3	No

Kansas State Univ.	Graduate	Distribution Systems Engineering	Elective	3	No
Kansas State Univ.	Graduate	Smart Grid Lab	Elective	3	Yes
Kansas State Univ.	Graduate	Advanced Power Electronics	Elective	3	No
Kansas State Univ.	Graduate	Power System Stability	Elective	3	No
Kansas State Univ.	Graduate	Power Quality	Elective	3	No
Kansas State Univ.	Graduate	Power Systems Operation and Control	Elective	3	No
Kansas State Univ.	Graduate	Smart Grid	Elective	3	No
Kansas State Univ.	Undergrad	Power Lab	Mandatory	3	Yes
Kansas State Univ.	Undergrad	Power System Protection	Elective	3	No
Kansas State Univ.	Undergrad	Power System Design	Mandatory	3	No
Kansas State Univ.	Undergrad	Power Electronics	Elective	3	No
Kansas State Univ.	Undergrad	Wind Research	Elective	1	Yes
Kansas State Univ.	Undergrad	Energy Conversion	Mandatory	3	No
Kansas State Univ.	Undergrad	Power Seminar	Mandatory	1	No
Kansas State Univ.	Undergrad	Wind and Solar Energy	Elective	3	Yes
Lake Superior State Univ.	Undergrad	Power Electronics	Mandatory	4	Yes
Lake Superior State Univ.	Undergrad	Vehicle Energy Systems	Elective	3	Yes
Lake Superior State Univ.	Undergrad	Electro-Mechanical Systems	Mandatory	4	Yes
Lake Superior State Univ.	Undergrad	Energy Systems and Sustainability	Elective	3	No
Lawrence Technological Univ.	Graduate	Power Electronics	Elective	4	Yes
Lawrence Technological Univ.	Graduate	Power Systems	Elective	4	No
Lawrence Technological Univ.	Graduate	Power System Fault Analysis	Elective	4	No
Lawrence Technological Univ.	Undergrad	Introduction to Electrical Systems	Mandatory	3	No
Lawrence Technological Univ.	Undergrad	Electrical Machinery Lab	Mandatory	1	Yes
Lawrence Technological Univ.	Undergrad	Power Electronics	Elective	3	Yes
Lawrence Technological Univ.	Undergrad	Introduction to Electrical Systems Lab	Mandatory	1	Yes
Lawrence Technological Univ.	Undergrad	Programmable Logic Controllers	Elective	3	Yes
Lawrence Technological Univ.	Undergrad	Electrical Machinery	Mandatory	3	No
Louisiana State Univ. and A&M College	Graduate	Harmonics in Power System	Elective	3	No
Louisiana State Univ. and A&M College	Graduate	Dynamics of Microgrids	Elective	3	No
Louisiana State Univ. and A&M College	Graduate	Power System Intelligent Control	Elective	3	No
Louisiana State Univ. and A&M College	Graduate	Advanced Electric Machines	Elective	3	No
Louisiana State Univ. and A&M College	Graduate	Advanced Compensator Design	Elective	3	No
Louisiana State Univ. and A&M College	Graduate	Advanced Power System Protection	Elective	3	No
Louisiana State Univ. and A&M College	Graduate	Advanced Electric Drives	Elective	3	No
Louisiana State Univ. and A&M College	Undergrad	Adjustable Speed Drives	Elective	3	Yes

Louisiana State Univ. and A&M College	Undergrad	Power System Protection with Lab	Elective	3	Yes
Louisiana State Univ. and A&M College	Undergrad	Power System Operations and Control	Elective	3	Yes
Louisiana State Univ. and A&M College	Undergrad	Electric Machine Design	Elective	3	Yes
Louisiana State Univ. and A&M College	Undergrad	Power Electronics	Elective	3	Yes
Louisiana State Univ. and A&M College	Undergrad	Modeling and Analysis of Smart Power System	Elective	3	No
Louisiana State Univ. and A&M College	Undergrad	Power System Modeling and Analysis with Lab	Elective	3	Yes
Louisiana State Univ. and A&M College	Undergrad	Introduction to Electric Power	Elective	3	No
Louisiana State Univ. and A&M College	Undergrad	Harmonic Filter Design with Lab	Elective	3	Yes
Marquette Univ.	Graduate	Power Electronics	Elective	3	Yes
Marquette Univ.	Graduate	Transients in Electric Energy Systems	Elective	3	No
Marquette Univ.	Graduate	Electric Energy Systems Analysis	Elective	3	No
Marquette Univ.	Graduate	Developments in Energy and Power	Elective	3	No
Marquette Univ.	Graduate	Design and Analysis of Electric Motor Drive	Elective	3	No
Marquette Univ.	Graduate	Protection and Monitoring of Electric Energy Systems	Elective	3	No
Marquette Univ.	Undergrad	Electric Drives	Mandatory	3	No
Massachusetts Institute of Technology	Graduate	Electric Machines	Elective	12	No
Massachusetts Institute of Technology	Graduate	Introduction to Electric Power Systems	Elective	12	No
Massachusetts Institute of Technology	Graduate	Power Electronics	Elective	12	No
Massachusetts Institute of Technology	Graduate	Engineering Economics and Regulation of the Electric Power Sector	Elective	12	No
Massachusetts Institute of Technology	Graduate	Advanced Topics in Power Electronics	Elective	12	Yes
Massachusetts Institute of Technology	Undergrad	Introduction to Electric Power Systems	Elective	12	No
Massachusetts Institute of Technology	Undergrad	Power Electronics Laboratory	Elective	12	Yes
McGill Univ.	Graduate	Power System Operation and Planning	Elective	3	No
McGill Univ.	Graduate	Introduction to Power Electronics	Elective	3	No
McGill Univ.	Graduate	Flexible AC Transmission Systems	Elective	3	No
McGill Univ.	Undergrad	Power Engineering	Mandatory	3	No
McGill Univ.	Undergrad	Power Electronic Systems	Elective	3	No
McGill Univ.	Undergrad	Industrial Power Systems	Elective	3	Yes
McGill Univ.	Undergrad	Power System Analysis	Elective	3	No
McGill Univ.	Undergrad	Power System Apparatus	Elective	3	Yes
McGill Univ.	Undergrad	Power Laboratory	Elective	2	Yes
McGill Univ.	Undergrad	Electromechanical Energy Conversion	Elective	3	No
McGill Univ.	Undergrad	Power System Transients	Elective	3	Yes
Memorial Univ. of Newfoundland	Graduate	Computer and Control Methods in Power Systems	Elective	3	No
Memorial Univ. of Newfoundland	Graduate	Advanced Electric Machines	Elective	3	No
Memorial Univ. of Newfoundland	Graduate	Advanced Power Electronics	Elective	3	No

Memorial Univ. of Newfoundland	Graduate	Renewable Energy Systems	Elective	3	Yes
Memorial Univ. of Newfoundland	Undergrad	Power System Analysis	Elective	3	Yes
Memorial Univ. of Newfoundland	Undergrad	Power System Operation	Elective	3	No
Miami Univ.	Graduate	Power Electronics	Elective	3	Yes
Miami Univ.	Graduate	Electric Machinery and Drives	Elective	3	No
Miami Univ.	Graduate	Power Systems Engineering	Elective	3	No
Miami Univ.	Undergrad	Electric Machinery and Drives	Elective	3	No
Miami Univ.	Undergrad	Power Systems Engineering	Elective	3	No
Miami Univ.	Undergrad	Power Electronics	Elective	3	Yes
Miami Univ.	Undergrad	Energy Systems Engineering	Elective	3	No
Michigan State Univ.	Graduate	Control of AC Machines	Elective	3	No
Michigan State Univ.	Graduate	Power System Stability and Control	Elective	3	No
Michigan State Univ.	Graduate	AC Machines Design	Elective	3	No
Michigan State Univ.	Graduate	Power Electronics Applications	Elective	3	No
Michigan State Univ.	Graduate	Advanced Power Electronics	Mandatory	3	No
Michigan State Univ.	Graduate	Power System Reliability	Elective	3	No
Michigan State Univ.	Undergrad	Energy Conversion / Power Electronics	Mandatory	3	No
Michigan State Univ.	Undergrad	Power Systems Analysis	Elective	3	No
Michigan State Univ.	Undergrad	Solid State Power Conversion	Elective	3	No
Michigan State Univ.	Undergrad	Power Laboratory	Elective	1	Yes
Michigan Technological Univ.	Graduate	Advanced Power Electronics	Elective	3	No
Michigan Technological Univ.	Graduate	Distribution Engineering	Elective	3	No
Michigan Technological Univ.	Graduate	Advanced Propulsion Systems for Hybrid	Elective	1	Yes
Michigan Technological Univ.	Graduate	Transient Analysis Methods	Elective	3	No
Michigan Technological Univ.	Graduate	Introduction to Energy Storage Systems	Elective	3	No
Michigan Technological Univ.	Graduate	Power System Protection Lab	Elective	1	Yes
Michigan Technological Univ.	Graduate	Wind Power	Elective	3	No
Michigan Technological Univ.	Graduate	Advanced Methods in Power Systems Analysis	Elective	3	No
Michigan Technological Univ.	Graduate	Power Systemes Dynamics and Stability	Elective	3	No
Michigan Technological Univ.	Graduate	Power System Operations	Elective	3	No
Michigan Technological Univ.	Graduate	Energy Control Center Applications	Elective	3	No
Michigan Technological Univ.	Graduate	Computer Modeling of Power Systems	Elective	3	No
Michigan Technological Univ.	Graduate	Advanced Propulsion Systems for Hybrid	Elective	3	No
Michigan Technological Univ.	Graduate	Advanced Electric Machines	Elective	3	No
Michigan Technological Univ.	Graduate	Power System Optimization	Elective	3	No
Michigan Technological Univ.	Graduate	Power System Protection	Elective	3	No
Michigan Technological Univ.	Undergrad	Power Engineering Laboratory	Elective	1	Yes

Michigan Technological Univ.	Undergrad	Power Electronics	Elective	3	No
Michigan Technological Univ.	Undergrad	Introduction to Propulsion Systems for Hybrid Electric Vehicles	Elective	1	Yes
Michigan Technological Univ.	Undergrad	Introduction to Electric Machines and Drives Lab	Elective	1	Yes
Michigan Technological Univ.	Undergrad	Introduction to Electric Machines and Drives Lab	Elective	3	No
Michigan Technological Univ.	Undergrad	Power Electronics Lab	Elective	1	Yes
Michigan Technological Univ.	Undergrad	Power System Analysis II	Elective	3	No
Michigan Technological Univ.	Undergrad	Power System Analysis I	Elective	3	No
Michigan Technological Univ.	Undergrad	Electric Energy Systems	Mandatory	3	No
Michigan Technological Univ.	Undergrad	Introduction to Propulsion Systems for Hybrid Electric Vehicles	Elective	3	No
Minnesota State Univ., Mankato	Graduate	Power Electronics	Elective	4	Yes
Minnesota State Univ., Mankato	Graduate	Electrical Power Systems Analysis and Design	Elective	3	No
Minnesota State Univ., Mankato	Undergrad	Power Electronics	Elective	4	Yes
Minnesota State Univ., Mankato	Undergrad	Electrical Power Systems	Mandatory	3	Yes
Minnesota State Univ., Mankato	Undergrad	Electrical Power Systems Analysis and Design	Elective	3	No
Minnesota State Univ., Mankato	Undergrad	Power Electronics	Elective	3	Yes
Mississippi State Univ.	Graduate	Introduction to Power Electronics	Elective	3	No
Mississippi State Univ.	Graduate	Insulation Coordination in Electrical Power Systems	Elective	3	Yes
Mississippi State Univ.	Graduate	Power Transmission Systems	Elective	3	No
Mississippi State Univ.	Graduate	Smart Grid	Elective	3	No
Mississippi State Univ.	Graduate	Fundamentals of High Voltage Engineering	Elective	3	Yes
Mississippi State Univ.	Graduate	Power Systems Operation and Control	Elective	3	No
Mississippi State Univ.	Graduate	Feedback Control Systems I	Elective	3	No
Mississippi State Univ.	Graduate	Power Distribution Systems	Elective	3	No
Mississippi State Univ.	Undergrad	Feedback Control Systems I	Elective	3	No
Mississippi State Univ.	Undergrad	Power Transmission Systems	Elective	3	No
Mississippi State Univ.	Undergrad	Fundamentals of High Voltage Engineering	Elective	3	Yes
Mississippi State Univ.	Undergrad	Fundamentals of Energy Systems	Mandatory	4	Yes
Mississippi State Univ.	Undergrad	Advanced Electronic Circuits	Elective	3	No
Mississippi State Univ.	Undergrad	Power Distribution Systems	Elective	3	No
Mississippi State Univ.	Undergrad	Introduction to Power Electronics	Elective	3	No
Mississippi State Univ.	Undergrad	Insulation Coordination In Electric Power Systems	Elective	3	Yes
Missouri Univ. of Science and Technology	Graduate	Computer Methods In Power System Analysis	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Power Converter Modeling and Design	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Power System Reliability -403	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Power System Stability	Elective	3	No

Missouri Univ. of Science and Technology	Graduate	Advanced Electric Drive Vehicles	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Power System Operations	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Surge Phenomena In Power Systems	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Advanced Power Electronics	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Advanced Theory of Electric Machines	Elective	3	No
Missouri Univ. of Science and Technology	Graduate	Power System Protection	Elective	3	No
Missouri Univ. of Science and Technology	Undergrad	Power Electronics	Elective	3	No
Missouri Univ. of Science and Technology	Undergrad	Electromechanics	Mandatory	3	Yes
Missouri Univ. of Science and Technology	Undergrad	Electric Drive Systems	Elective	3	No
Missouri Univ. of Science and Technology	Undergrad	Power Electronics Laboratory	Elective	2	Yes
Missouri Univ. of Science and Technology	Undergrad	Extra High Voltage Engineering	Elective	3	Yes
Missouri Univ. of Science and Technology	Undergrad	Power System Design And Analysis	Mandatory	3	Yes
Missouri Univ. of Science and Technology	Undergrad	Electric Drive Vehicles	Elective	3	No
Missouri Univ. of Science and Technology	Undergrad	Electric Power Quality	Elective	3	No
Montana State Univ., Bozeman	Graduate	Alternative Energy Distributed Power Generation	Elective	3	No
Montana State Univ., Bozeman	Graduate	Advance Power Electronics	Elective	3	No
Montana State Univ., Bozeman	Graduate	Power System Dynamics	Elective	3	No
Montana State Univ., Bozeman	Undergrad	Power System Analysis	Elective	3	Yes
Montana State Univ., Bozeman	Undergrad	Power System Protection and Control	Elective	3	No
Montana State Univ., Bozeman	Undergrad	Electromechanical Energy Conversion and Drives	Mandatory	4	Yes
Montana State Univ., Bozeman	Undergrad	Alternative Energy Power Generation	Elective	3	No
Montana State Univ., Bozeman	Undergrad	Power Electronics	Elective	3	Yes
New Jersey Institute of Technology	Graduate	Protection of Power Systems	Elective	3	No
New Jersey Institute of Technology	Graduate	Power Systems Steady State Analysis	Mandatory	3	No
New Jersey Institute of Technology	Graduate	Power Electronics	Elective	3	No
New Jersey Institute of Technology	Graduate	Transients in Power Systems	Mandatory	3	No
New Jersey Institute of Technology	Graduate	Renewable Energy Systems	Elective	3	No
New Jersey Institute of Technology	Graduate	Economic Control of Interconnctd Power Systems (ECE 617)	Mandatory	3	No
New Jersey Institute of Technology	Undergrad	Energy Conversion	Mandatory	3	No
New Jersey Institute of Technology	Undergrad	Renewable Energy Systems	Elective	3	No
New Jersey Institute of Technology	Undergrad	Power Systems Lab	Elective	2	Yes

New Jersey Institute of Technology	Undergrad	Electrical Engineering Lab III	Mandatory	3	Yes
New Jersey Institute of Technology	Undergrad	Power Systems Elective	Elective	3	No
New Mexico State Univ.	Graduate	Power Distribution Systems	Elective	3	No
New Mexico State Univ.	Graduate	Power Systems III	Mandatory	3	No
New Mexico State Univ.	Graduate	Power System Modeling and Computational Methods	Elective	3	No
New Mexico State Univ.	Graduate	Power System Overvoltage Transients	Elective	3	No
New Mexico State Univ.	Graduate	Advanced Distribution Systems	Elective	3	No
New Mexico State Univ.	Graduate	Dynamics of Power System	Elective	3	No
New Mexico State Univ.	Graduate	Power Electronics	Elective	3	No
New Mexico State Univ.	Graduate	Power Systems II	Mandatory	3	No
New Mexico State Univ.	Graduate	Power System Relaying	Elective	3	Yes
New Mexico State Univ.	Graduate	Power System Operation	Elective	3	No
New Mexico State Univ.	Undergrad	Power Systems II	Elective	3	No
New Mexico State Univ.	Undergrad	Power Electronics	Elective	3	Yes
New Mexico State Univ.	Undergrad	Power Systems III	Elective	3	No
New Mexico State Univ.	Undergrad	Introduction to Electric Power System	Mandatory	4	Yes
New Mexico State Univ.	Undergrad	Power Distribution Systems	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Power System Stability	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Introduction to Electric Power Systems	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Adjustable Speed Drives	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Electronic Power Supplies	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Power Systems Economics and Planning	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Distributed Generation Systems	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Finite Elements for Electrical Engineering	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Power Electronics	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Transients, Surges and Faults in Power Systems	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Resonant Power Converters	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Physics of Alternative Energy	Elective	3	No
New York Univ. Polytechnic School of Engineering	Graduate	Electric Transmission and Distribution Systems	Elective	3	No
New York Univ. Polytechnic School of Engineering	Undergrad	Electric Energy Conversion Systems	Elective	4	Yes

New York Univ. Polytechnic School of Engineering	Undergrad	Electrical Engineering Design Project in Power	Elective	3	No
New York Univ. Polytechnic School of Engineering	Undergrad	Electrical Power and Machinery	Elective	3	Yes
New York Univ. Polytechnic School of Engineering	Undergrad	Introduction to Electric Power Systems	Elective	3	No
New York Univ. Polytechnic School of Engineering	Undergrad	Electric and Hybrid Vehicles	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Power Electronics	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Power System Operation and Control	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Dynamics and Control of Electric Machines	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Communication and SCADA Systems for Smart Grid	Elective	3	Yes
North Carolina State Univ. at Raleigh	Graduate	Power Engineering Practicum	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Power System Dynamics	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Smart Power Distribution Systems	Elective	3	Yes
North Carolina State Univ. at Raleigh	Graduate	Power Electronics and Utility Applications	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Power System Protection	Elective	3	Yes
North Carolina State Univ. at Raleigh	Graduate	Capstone Project	Elective	3	Yes
North Carolina State Univ. at Raleigh	Graduate	Computational Methods for Power Engineering	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Electric Power Generation: Conventional and Renewable	Elective	3	Yes
North Carolina State Univ. at Raleigh	Graduate	Electronic Energy Packaging	Elective	3	No
North Carolina State Univ. at Raleigh	Graduate	Business of Electric Power Utility	Elective	3	No
North Carolina State Univ. at Raleigh	Undergrad	Power Electronics	Elective	3	Yes
North Carolina State Univ. at Raleigh	Undergrad	Electric Power Systems	Elective	3	No
North Carolina State Univ. at Raleigh	Undergrad	Renewable Electric Energy Systems	Elective	3	Yes
North Carolina State Univ. at Raleigh	Undergrad	Power System Analysis	Elective	3	No
North Carolina State Univ. at Raleigh	Undergrad	Electric Motor Drives	Elective	3	No
North Dakota State Univ.	Graduate	Power Systems Protection	Elective	3	No
North Dakota State Univ.	Graduate	Power Distribution	Elective	3	No
North Dakota State Univ.	Undergrad	Power Systems Design	Elective	3	No
North Dakota State Univ.	Undergrad	Computational Methods in Power Systems	Elective	3	No
North Dakota State Univ.	Undergrad	Power Systems Analysis	Elective	3	No
Northeastern Univ.	Graduate	State Estimation	Elective	4	No

Northeastern Univ.	Graduate	Sustainable Energy	Elective	4	Yes
Northeastern Univ.	Graduate	Power System Analysis	Elective	4	Yes
Northeastern Univ.	Graduate	Modeling and Simulation of Power System	Elective	4	No
Northeastern Univ.	Graduate	Energy Harvesting	Elective	4	No
Northeastern Univ.	Graduate	Unbalanced Power Systems	Elective	4	No
Northeastern Univ.	Graduate	Power Electronics	Elective	4	Yes
Ohio Northern Univ.	Undergrad	Advanced Power	Elective	3	No
Ohio Northern Univ.	Undergrad	Energy Systems I	Mandatory	3	No
Ohio Northern Univ.	Undergrad	Photovoltaic and Power Devices	Elective	3	No
Ohio Northern Univ.	Undergrad	Smart Grid	Elective	3	No
Ohio Northern Univ.	Undergrad	Energy Systems I	Mandatory	4	Yes
Ohio State Univ.	Graduate	Advanced Topics of Electric Machines	Elective	3	No
Ohio State Univ.	Graduate	Advanced Topics of Power Electronics	Elective	3	No
Ohio State Univ.	Graduate	Advanced Topics of Power Systems	Elective	3	No
Ohio State Univ.	Undergrad	Electric Machines	Elective	3	No
Ohio State Univ.	Undergrad	Sustainable Energy and Power Systems II	Elective	3	No
Ohio State Univ.	Undergrad	Sustainable Energy Lab	Elective	1	Yes
Ohio State Univ.	Undergrad	Sustainable Energy and Power Systems I	Mandatory	3	No
Ohio State Univ.	Undergrad	Power System	Elective	3	No
Ohio State Univ.	Undergrad	Power Electronics Lab	Elective	1	Yes
Ohio State Univ.	Undergrad	Power Electronics	Elective	3	No
Ohio State Univ.	Undergrad	High Voltage Engineering	Elective	3	Yes
Oklahoma State Univ.	Graduate	Advanced Power Electronics	Elective	3	No
Oklahoma State Univ.	Graduate	Engineering Systems Reliability Evaluation	Elective	3	No
Oklahoma State Univ.	Graduate	Power System Analysis by Computer Methods	Elective	3	No
Oklahoma State Univ.	Graduate	Power Economics and Regulation	Elective	3	No
Oklahoma State Univ.	Graduate	Direct Energy Conversion	Elective	3	No
Oklahoma State Univ.	Undergrad	Power Electronics	Elective	3	No
Oklahoma State Univ.	Undergrad	Power System Analysis	Elective	3	No
Oklahoma State Univ.	Undergrad	Energy, Economics and Environment	Elective	3	No
Oregon Institute of Technology	Graduate	Wind Power Generators	Elective	3*	No
Oregon Institute of Technology	Graduate	Power System Protection and Control	Elective	3*	No
Oregon Institute of Technology	Graduate	Energy Systems Management and Auditing	Elective	3*	No
Oregon Institute of Technology	Graduate	Electric Power Conversion	Elective	3*	No
Oregon Institute of Technology	Graduate	Grid Integration of Renewables	Elective	3*	No
Oregon Institute of Technology	Graduate	Energy-Efficient Building Design	Elective	3*	No
Oregon Institute of Technology	Graduate	Wind Energy Systems Integration	Elective	3*	No
Oregon Institute of Technology	Graduate	Power System Analysis	Elective	3*	No
Oregon Institute of Technology	Graduate	HVAC	Elective	3*	No
Oregon Institute of Technology	Undergrad	HVAC	Elective	3*	Yes
Oregon Institute of Technology	Undergrad	Geothermal Energy	Elective	3*	No

Oregon Institute of Technology	Undergrad	Grid Integration of Renewables	Elective	3*	No
Oregon Institute of Technology	Undergrad	Electromechanical Energy Conversions	Mandatory	3*	Yes
Oregon Institute of Technology	Undergrad	Nuclear Energy	Elective	3*	No
Oregon Institute of Technology	Undergrad	Photovoltaic Systems	Mandatory	3*	No
Oregon Institute of Technology	Undergrad	Energy-Efficient Building Design	Elective	3*	No
Oregon Institute of Technology	Undergrad	Power Systems Analysis	Elective	3*	No
Oregon Institute of Technology	Undergrad	Energy Systems Instrumentation	Mandatory	3*	No
Oregon Institute of Technology	Undergrad	Wind Power	Elective	3*	No
Oregon Institute of Technology	Undergrad	Power Electronics	Mandatory	4*	Yes
Oregon Institute of Technology	Undergrad	Solar Thermal Energy Systems	Elective	3*	No
Oregon Institute of Technology	Undergrad	Building Energy Management and Auditing	Elective	3*	No
Oregon Institute of Technology	Undergrad	Power System Protection and Control	Elective	3*	No
Oregon Institute of Technology	Undergrad	Electrical Power	Mandatory	4*	Yes
Oregon Institute of Technology	Undergrad	Hydroelectric Power	Elective	3*	No
Oregon Institute of Technology	Undergrad	Electric Power Conversion Systems	Mandatory	3*	Yes
Oregon State Univ.	Graduate	Power Systems Analysis	Elective	4*	No
Oregon State Univ.	Graduate	Contemporary Energy Applications	Mandatory	4*	No
Oregon State Univ.	Graduate	Power System Protection	Elective	3*	No
Oregon State Univ.	Graduate	Power Electronics	Elective	4*	Yes
Oregon State Univ.	Undergrad	Power System Analysis	Elective	4*	No
Oregon State Univ.	Undergrad	Hybrid Electric Vehicles	Elective	3*	No
Oregon State Univ.	Undergrad	Smart Grid	Elective	3*	No
Oregon State Univ.	Undergrad	Electromechanical Energy Conversion	Mandatory	4*	Yes
Oregon State Univ.	Undergrad	Power Electronics	Elective	4*	Yes
Oregon State Univ.	Undergrad	Dynamics of Electromechanical Energy	Elective	4*	Yes
Pennsylvania State Univ., Harrisburg	Graduate	Power Systems Control and Operation	Elective	3	No
Pennsylvania State Univ., Harrisburg	Graduate	Power Systems Analysis I	Elective	3	No
Pennsylvania State Univ., Harrisburg	Graduate	Smart Grid System Evaluation and Modeling	Elective	3	No
Pennsylvania State Univ., Harrisburg	Graduate	Power Systems Analysis II	Elective	3	No
Pennsylvania State Univ., Harrisburg	Undergrad	Power Systems Analysis I	Elective	3	Yes
Pennsylvania State Univ., Harrisburg	Undergrad	Power Systems Analysis II	Elective	3	No
Pennsylvania State Univ., Harrisburg	Undergrad	Power Electronics	Elective	3	No
Pennsylvania State Univ., Harrisburg	Undergrad	Energy Systems and Conversion	Mandatory	3	No
Purdue Univ., Calumet	Graduate	Advanced Electric Drives	Elective	3	Yes
Purdue Univ., Calumet	Graduate	Power Electronics	Elective	3	Yes

Purdue Univ., Calumet	Undergrad	Electric Drives	Elective	3	Yes
Purdue Univ., Calumet	Undergrad	Power Systems	Elective	3	No
Purdue Univ., Calumet	Undergrad	Power Electronics	Elective	3	Yes
Purdue Univ., West Lafayette	Graduate	Modeling and Simulation of Power System	Elective	3	No
Purdue Univ., West Lafayette	Graduate	Computational Methods for Power System	Elective	3	No
Purdue Univ., West Lafayette	Graduate	Advanced Power Electronics	Elective	3	No
Purdue Univ., West Lafayette	Graduate	Advanced Analysis of Electromechanical	Elective	3	No
Purdue Univ., West Lafayette	Graduate	Energy Conversion	Mandatory	3	No
Purdue Univ., West Lafayette	Graduate	Magnetic Component Design	Elective	3	No
Purdue Univ., West Lafayette	Undergrad	Electric Vehicles	Elective	3	No
Purdue Univ., West Lafayette	Undergrad	Power Electronics	Elective	3	Yes
Purdue Univ., West Lafayette	Undergrad	Electromechanics	Elective	3	Yes
Purdue Univ., West Lafayette	Undergrad	Electric Drives	Elective	3	No
Purdue Univ., West Lafayette	Undergrad	Power Engineering	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Mechanical Aspects of EP Apparatus	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Advanced Electrical Drive Systems	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Power System Analysis	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Power Generation, Operation, and Control	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Surge Phenomenon in EPE	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Advanced Power System Modeling and Control	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Advanced Power Electronics	Elective	3	Yes
Rensselaer Polytechnic Institute	Graduate	Electric and Magnetic Field in EPE	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Computer Methods in EPE	Elective	3	No
Rensselaer Polytechnic Institute	Graduate	Power Quality	Elective	3	No
Rensselaer Polytechnic Institute	Undergrad	Electric Power Laboratory	Elective	4	Yes
Rensselaer Polytechnic Institute	Undergrad	Electromechanics	Elective	3	No
Rensselaer Polytechnic Institute	Undergrad	Fields and Waves II	Elective	3	No
Rensselaer Polytechnic Institute	Undergrad	Power Engineering Analysis	Elective	3	No
Rensselaer Polytechnic Institute	Undergrad	Electrical Energy Systems	Mandatory	3	No
Rensselaer Polytechnic Institute	Undergrad	Semiconductor Power Electronics	Elective	3	No
San Jose State Univ.	Graduate	Vector Control of AC Machine	Elective	3	No
San Jose State Univ.	Graduate	Advanced Power Electronics	Elective	3	No
San Jose State Univ.	Undergrad	Power Systems	Elective	3	No

San Jose State Univ.	Undergrad	Electrical Machines	Elective	3	No
San Jose State Univ.	Undergrad	Power Electronics	Elective	3	Yes
Santa Clara Univ.	Graduate	Energy Management (Engr 288)	Mandatory	2*	No
Santa Clara Univ.	Graduate	Renewable Energy (ELEN 284)	Elective	2*	No
Santa Clara Univ.	Graduate	Power Generation (ELEN 281A)	Mandatory	3*	No
Santa Clara Univ.	Graduate	Introduction to Wind Energy Engineering (ELEN 286)	Mandatory	2*	No
Santa Clara Univ.	Graduate	Renewable Energy (ELEN 281B)	Mandatory	2*	No
Santa Clara Univ.	Graduate	Storage Device Systems (ELEN 287)	Mandatory	2*	No
Santa Clara Univ.	Graduate	Renewable Energy (ELEN 282)	Elective	2*	Yes
Santa Clara Univ.	Graduate	Renewable Energy (ELEN 208)	Mandatory	2*	No
Santa Clara Univ.	Graduate	Introduction to the Smart Grid (ELEN 285)	Mandatory	2*	No
Santa Clara Univ.	Undergrad	Introduction to Information Storage	Elective	4*	Yes
Seattle Univ.	Undergrad	Power Electronics	Elective	4*	No
Seattle Univ.	Undergrad	Power System Analysis	Elective	4*	No
Seattle Univ.	Undergrad	Renewable Energy Systems	Elective	4*	No
Seattle Univ.	Undergrad	Energy Conversion Lab	Elective	2*	Yes
Seattle Univ.	Undergrad	Electromechanical Energy Conversion	Elective	4*	No
Smith College	Undergrad	Electric Power Systems	Elective	4	Yes
Smith College	Undergrad	Engineering Thermodynamics	Mandatory	4	No
Smith College	Undergrad	Dynamic Systems	Elective	4	No
Smith College	Undergrad	Photovoltaic and Fuel Cell System Design	Elective	4	Yes
Smith College	Undergrad	Wireless Sensor Networks	Elective	4	Yes
Smith College	Undergrad	Engineering Circuit Theory	Mandatory	4	Yes
Smith College	Undergrad	Signals and Systems	Elective	4	Yes
South Dakota School of Mines and Technology	Undergrad	Motor Drives	Elective	3*	Yes
South Dakota School of Mines and Technology	Undergrad	Power Systems I	Elective	4*	Yes
South Dakota School of Mines and Technology	Undergrad	Power Distribution and Transmission	Elective	3*	Yes
South Dakota School of Mines and Technology	Undergrad	Grid Connected Power Electronics	Elective	3*	Yes
South Dakota School of Mines and Technology	Undergrad	Power Electronics	Elective	4*	Yes
South Dakota School of Mines and Technology	Undergrad	Energy Systems	Mandatory	3*	Yes
South Dakota School of Mines and Technology	Undergrad	Power Generation	Elective	3*	Yes
South Dakota School of Mines and Technology	Undergrad	Power Systems II	Elective	3*	Yes
South Dakota State Univ.	Graduate	Advanced Power Electronics	Mandatory	4	Yes
South Dakota State Univ.	Graduate	Power Seminar	Elective	1	No
South Dakota State Univ.	Graduate	Photovoltaic Systems Engineering	Mandatory	4	Yes
South Dakota State Univ.	Graduate	Advanced Power System	Mandatory	3	No
South Dakota State Univ.	Graduate	Linear Systems Theory	Mandatory	3	No
South Dakota State Univ.	Graduate	Wind Energy Systems	Elective	3	No
South Dakota State Univ.	Undergrad	Applied Photovoltaics and Lab	Elective	4	Yes

South Dakota State Univ.	Undergrad	Engineering Economics and Management	Elective	3	No
South Dakota State Univ.	Undergrad	Electromagnetics	Mandatory	4	Yes
South Dakota State Univ.	Undergrad	Linear Control Systems	Mandatory	3	No
South Dakota State Univ.	Undergrad	Power Technology Tour	Elective	1	No
South Dakota State Univ.	Undergrad	Electronics I and Lab	Mandatory	4	Yes
South Dakota State Univ.	Undergrad	Power Systems Analysis and Lab	Elective	4	Yes
South Dakota State Univ.	Undergrad	Electromechanical Systems and Lab	Elective	4	Yes
South Dakota State Univ.	Undergrad	Electronics II and Lab	Mandatory	4	Yes
Southern Polytechnic State Univ.	Undergrad	Power Electronics	Elective	3	Yes
Southern Polytechnic State Univ.	Undergrad	Electric Machines	Mandatory	4	Yes
Southern Polytechnic State Univ.	Undergrad	Electric Drives	Elective	3	Yes
State Univ. of New York at Buffalo	Graduate	Smart Grid	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Communication Electronics	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Renewable Distributed Generation and Storage	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Electronic Instrument Design	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Experimental Electrical Markets	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Power Systems Engineering I	Elective	3	Yes
State Univ. of New York at Buffalo	Graduate	Advanced Energy Grids Systems II	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Smart Grid Energy Systems	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Sustainable Energy	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Power Systems Engineering II	Elective	3	Yes
State Univ. of New York at Buffalo	Graduate	Intro to Plasma Processing	Elective	3	No
State Univ. of New York at Buffalo	Graduate	Electrical Devices	Elective	3	Yes
State Univ. of New York at Buffalo	Undergrad	Smart Grid	Elective	3	No
State Univ. of New York at Buffalo	Undergrad	Renewable Distributed Energy Generation and Storage	Elective	3	No
State Univ. of New York at Buffalo	Undergrad	Electrical Devices	Elective	4	Yes
State Univ. of New York at Buffalo	Undergrad	Power Systems Engineering	Elective	4	Yes
State Univ. of New York at Buffalo	Undergrad	Experimental Electric Markets	Elective	3	No
State Univ. of New York at Buffalo	Undergrad	Electronic Instrument Design	Elective	4	No
State Univ. of New York at Buffalo	Undergrad	Energy Systems	Mandatory	3	No
State Univ. of New York at Buffalo	Undergrad	High Voltage Engineering	Elective	3	No

State Univ. of New York at Buffalo	Undergrad	Integrated Power Electronics	Elective	3	No
State Univ. of New York at Buffalo	Undergrad	Smart Grid Energy Systems	Elective	3	No
State Univ. of New York at Buffalo	Undergrad	Advanced Energy Grid Systems II	Elective	3	No
State Univ. of New York at Buffalo	Undergrad	Industrial Control Systems	Elective	3	No
State Univ. of New York at Buffalo	Undergrad	Sustainable Energy	Elective	3	No
Syracuse Univ.	Graduate	Advanced Measurement in Power Engineering	Elective	3	Yes
Syracuse Univ.	Graduate	Eletromechanical Devices	Elective	3	Yes
Syracuse Univ.	Graduate	Control of Distributed Generation	Elective	3	No
Syracuse Univ.	Graduate	Power Systems Protection	Elective	3	Yes
Syracuse Univ.	Graduate	Power Electronics	Elective	3	Yes
Syracuse Univ.	Graduate	Distributed Generation Integration in Smart Grid	Elective	3	No
Syracuse Univ.	Graduate	Smart Grid Security Seminar	Elective	3	No
Syracuse Univ.	Graduate	Smart Grid: Security, Privacy and Economics	Elective	3	No
Syracuse Univ.	Graduate	Sensors and Measurements	Elective	3	No
Syracuse Univ.	Graduate	Introductin to Smart Grid	Elective	3	No
Syracuse Univ.	Undergrad	Distributed Generation Integration in Smart Grid	Elective	3	No
Syracuse Univ.	Undergrad	Power Electronics	Elective	3	Yes
Syracuse Univ.	Undergrad	Eletromechanical Devices	Elective	3	Yes
Syracuse Univ.	Undergrad	Sensors and Measurements	Elective	3	No
Syracuse Univ.	Undergrad	Power System	Elective	3	No
Syracuse Univ.	Undergrad	Introduction to Smart Grid	Elective	3	No
Temple Univ.	Graduate	Electric Machines and Drives	Elective	3	No
Temple Univ.	Graduate	Power Systems Engineering	Elective	3	No
Temple Univ.	Undergrad	Electromagnetic Energy Systems	Elective	3	No
Temple Univ.	Undergrad	Modern Power Engineering and	Elective	3	No
Tennessee State Univ.	Graduate	Modern Control Systems	Elective	3	No
Tennessee State Univ.	Graduate	Probability, Statics and Risk Analysis	Mandatory	3	No
Tennessee State Univ.	Graduate	Transients in Power Systems	Mandatory	3	No
Tennessee State Univ.	Graduate	Computer Application to Power Systems	Mandatory	3	No
Tennessee State Univ.	Graduate	Special Topics in Power Systems	Mandatory	3	No
Tennessee State Univ.	Graduate	Power Systems Relaying	Mandatory	3	No
Tennessee State Univ.	Undergrad	Power Systems	Mandatory	3	No
Tennessee State Univ.	Undergrad	Electrical Systems Design Lab	Mandatory	1	Yes
Tennessee State Univ.	Undergrad	Electric Power Distribution	Elective	3	No
Tennessee State Univ.	Undergrad	Energy Conversion	Mandatory	3	No
Tennessee State Univ.	Undergrad	Design of Renewable Energy Sources for a Remote Community	Elective	3	No
Tennessee State Univ.	Undergrad	Control Systems and Lab	Mandatory	3	Yes
Texas A&M Univ.	Graduate	Control of Electric Power Systems	Elective	3	Yes
Texas A&M Univ.	Graduate	Power System State Estimation	Elective	3	No
Texas A&M Univ.	Graduate	Sustainable Energy and Vehicle Systems	Elective	3	No
Texas A&M Univ.	Graduate	Analysis of Power Electronic Systems	Elective	3	No
Texas A&M Univ.	Graduate	Physical and Economical Operations of Sustainable Energy Systems	Elective	3	No

Texas A&M Univ.	Graduate	Power System Faults and Protective Relaying	Elective	3	Yes
Texas A&M Univ.	Graduate	Computer Aided Design of Electromechanical Motion Devices	Elective	3	No
Texas A&M Univ.	Graduate	Computer Relays for Electric Power Systems	Elective	3	Yes
Texas A&M Univ.	Graduate	Methods of Electric Power Systems Analysis	Elective	3	No
Texas A&M Univ.	Graduate	Power Electronics for Renewable Energy	Elective	3	Yes
Texas A&M Univ.	Graduate	Motor Drive Dynamics	Elective	3	Yes
Texas A&M Univ.	Graduate	Power System Stability	Elective	3	No
Texas A&M Univ.	Graduate	Rectifier and Inverter Circuits	Elective	3	Yes
Texas A&M Univ.	Graduate	Electric and Hybrid Vehicles	Elective	3	No
Texas A&M Univ.	Graduate	Power System Electromagnetic	Elective	3	No
Texas A&M Univ.	Graduate	Electrical Aspects of Sustainable Energy Production, Storage, and	Elective	3	No
Texas A&M Univ.	Graduate	Electric Power System Reliability	Elective	3	No
Texas A&M Univ.	Graduate	General Theory of Electromechanical	Elective	3	No
Texas A&M Univ.	Undergrad	Electric Power Systems II	Elective	4	Yes
Texas A&M Univ.	Undergrad	DSP-Based Electromechanical	Elective	3	Yes
Texas A&M Univ.	Undergrad	Power Electronics	Elective	4	Yes
Texas A&M Univ.	Undergrad	Physical and Economical Operations of Sustainable Energy Systems	Elective	3	Yes
Texas A&M Univ.	Undergrad	Electric Power Systems I	Elective	4	Yes
Texas A&M Univ.	Undergrad	Electronic Motor Drives	Elective	4	Yes
Texas Tech Univ.	Graduate	Power Electronics	Elective	3	No
Texas Tech Univ.	Graduate	Electric Machines and Drives	Elective	3	No
Texas Tech Univ.	Graduate	Power Systems Engineering	Elective	3	No
Texas Tech Univ.	Undergrad	DC-DC Power Supplies	Elective	3	No
Texas Tech Univ.	Undergrad	Power Electronics	Elective	3	No
Texas Tech Univ.	Undergrad	Power Systems Engineering	Elective	3	No
Texas Tech Univ.	Undergrad	Electric Machines and Drives	Elective	3	No
Tufts Univ.	Graduate	Power Systems	Elective	4	No
Tufts Univ.	Graduate	Power Electronics	Elective	4	No
Tufts Univ.	Undergrad	Power Electronics	Elective	4	No
Tufts Univ.	Undergrad	Power Systems	Elective	4	No
United States Military Academy	Undergrad	Electric Power Engineering	Mandatory	3	Yes
United States Military Academy	Undergrad	Alternative Energy Engineering	Elective	3	Yes
Univ. of Alabama, Tuscaloosa	Graduate	Advanced Electric Machines and Drives	Elective	3	No
Univ. of Alabama, Tuscaloosa	Graduate	Multi-Agent Systems for Distributed Generation Automation	Elective	3	No
Univ. of Alabama, Tuscaloosa	Undergrad	Power Electronics	Elective	3	Yes
Univ. of Alabama, Tuscaloosa	Undergrad	Electric Power and Machines	Mandatory	3	Yes
Univ. of Alabama, Tuscaloosa	Undergrad	Power Systems	Elective	3	Yes
Univ. of Alaska Fairbanks	Graduate	Renewable and Sustainable Energy	Elective	3	No
Univ. of Alaska Fairbanks	Graduate	Power Electronics Design	Elective	4	Yes

Univ. of Alaska Fairbanks	Undergrad	Electrical Power Engineering	Mandatory	4	Yes
Univ. of Alaska Fairbanks	Undergrad	Renewable and Sustainable Energy	Elective	3	No
Univ. of Alaska Fairbanks	Undergrad	Electric Machinery	Mandatory	4	Yes
Univ. of Alaska Fairbanks	Undergrad	Power Electronics Design	Mandatory	4	Yes
Univ. of Alaska Fairbanks	Undergrad	Electrical Power Systems	Mandatory	4	Yes
Univ. of Alberta	Graduate	Dynamics and Controls of Voltage-Source Converters (ECE 636)	Elective	36	No
Univ. of Alberta	Graduate	Power Quality and Power Disturbance Analysis (ECE)	Elective	36	No
Univ. of Alberta	Graduate	Modeling and Simulation of Electromagnetic Transients (ECE 633)	Elective	36	No
Univ. of Alberta	Graduate	Industrial Drive Systems (ECE 531)	Elective	36	No
Univ. of Alberta	Graduate	Power Converters and Renewable Energy Systems (ECE 635)	Elective	36	No
Univ. of Alberta	Graduate	Clean Energy and Electrical Systems (ECE)	Elective	36	No
Univ. of Alberta	Undergrad	Variable Speed Drives (ECE 432)	Elective	36	Yes
Univ. of Alberta	Undergrad	Introduction of Power Engineering (ECE 330)	Mandatory	36	No
Univ. of Alberta	Undergrad	Power Electronics (ECE 401)	Elective	36	Yes
Univ. of Alberta	Undergrad	Power System Stability and Transients (ECE 433)	Elective	36	Yes
Univ. of Alberta	Undergrad	Electric Machines (ECE 332)	Mandatory	36	Yes
Univ. of Alberta	Undergrad	Power System Analysis (ECE 430)	Elective	36	No
Univ. of Arkansas	Graduate	Electric Power Quality	Elective	3	No
Univ. of Arkansas	Graduate	Power Systems Operation and Control	Elective	3	No
Univ. of Arkansas	Graduate	Power Electronics and Motor Drives	Elective	3	No
Univ. of Arkansas	Graduate	Power Semiconductor Devices	Elective	3	No
Univ. of Arkansas	Graduate	Design of Advanced Power Distribution	Elective	3	No
Univ. of Arkansas	Graduate	Power Systemes Analysis	Elective	3	No
Univ. of Arkansas	Undergrad	Electric Power Distribution Systems	Elective	3	No
Univ. of Arkansas	Undergrad	Design and Fabrication of Solar Cells	Elective	3	No
Univ. of Arkansas	Undergrad	Power Systems Analysis	Elective	3	No
Univ. of Arkansas	Undergrad	Energy Systems	Mandatory	4	Yes
Univ. of Arkansas	Undergrad	Switch Mode Power Conversion	Elective	3	No
Univ. of Calgary	Graduate	Grid-Connected Inverters for Alternative Energy Systems	Elective	3	No
Univ. of Calgary	Graduate	Power Systems Operation -601	Elective	3	No
Univ. of Calgary	Graduate	Restructured Electricity Markets (ENEL 693)	Elective	3	No
Univ. of Calgary	Undergrad	Energy Systems (ENEL 487)	Mandatory	3	Yes
Univ. of Calgary	Undergrad	Power Systems Protection	Elective	3	Yes
Univ. of Calgary	Undergrad	Power Electronics (ENEL 585)	Elective	3	Yes
Univ. of Calgary	Undergrad	Electric Machines (ENEL 489)	Elective	3	Yes
Univ. of Calgary	Undergrad	Power Systems Operation (ENEL 597)	Elective	3	No
Univ. of Calgary	Undergrad	Power Systems (ENEL 587)	Elective	3	Yes
Univ. of California, Berkeley	Graduate	Photovoltaic Materials (ER C226/Mat Sci 226)	Elective	4	No
Univ. of California, Berkeley	Graduate	Electric Power Systems ER 254	Elective	3	No

Univ. of California, Berkeley	Graduate	Energy and Society (ER C200)	Elective	4	No
Univ. of California, Berkeley	Graduate	Advanced Topics in Circuit Design (EE 290C)	Elective	3	No
Univ. of California, Berkeley	Undergrad	Energy and Society (ER C100)	Elective	4	No
Univ. of California, Berkeley	Undergrad	Introduction to Electric Power Systems (EE 137B)	Elective	4	No
Univ. of California, Berkeley	Undergrad	Power Electronics (EE 113)	Elective	4	Yes
Univ. of California, Berkeley	Undergrad	Fundamentals of Photovoltaic Devices (EE)	Elective	4	No
Univ. of California, Berkeley	Undergrad	Introduction to Electric Power Systems (EE 137A)	Elective	4	No
Univ. of California, Irvine	Graduate	Power Electronics	Elective	4*	Yes
Univ. of California, Irvine	Graduate	Advance Topic In Power Electronics	Elective	3*	No
Univ. of California, Irvine	Undergrad	Power Electronics	Elective	4*	Yes
Univ. of California, Los Angeles	Graduate	Power System II	Elective	4	Yes
Univ. of California, Los Angeles	Undergrad	Fundamental Electrical Engineering	Elective	3	Yes
Univ. of Central Florida	Graduate	Advanced Power Systems Analysis	Elective	3	No
Univ. of Central Florida	Graduate	Power Electronics II	Elective	3	No
Univ. of Central Florida	Graduate	Distributed Control and Optimization for Smart	Elective	3	No
Univ. of Central Florida	Graduate	Advanced Electric Machinery	Elective	3	No
Univ. of Central Florida	Graduate	Advanced Topics in Power Engineering	Elective	3	No
Univ. of Central Florida	Graduate	Power Electronics	Elective	3	No
Univ. of Central Florida	Undergrad	Electric Machinery	Elective	3	Yes
Univ. of Central Florida	Undergrad	Fundamentals of Electric Power Systems	Elective	3	Yes
Univ. of Denver	Graduate	Power System Protection	Elective	4*	No
Univ. of Denver	Graduate	Introduction to Power and Energy	Elective	4*	No
Univ. of Denver	Graduate	Electric Power Economy	Elective	4*	No
Univ. of Denver	Graduate	Electric Power Systems	Elective	4*	No
Univ. of Denver	Graduate	Advanced Controls	Elective	4*	No
Univ. of Denver	Graduate	Renewable and Efficient Power and Energy	Elective	4*	No
Univ. of Denver	Graduate	Power Generation, Operation, and Control	Elective	4*	No
Univ. of Denver	Undergrad	Renewable and Efficient Power System	Mandatory	4*	No
Univ. of Denver	Undergrad	Electric Power Systems	Elective	4*	No
Univ. of Denver	Undergrad	Electric Power Economy	Elective	3*	No
Univ. of Denver	Undergrad	Introduction to Power and Energy Systems	Mandatory	3*	Yes
Univ. of Houston	Graduate	Industrial Power Monitoring and Control	Mandatory	3	No
Univ. of Houston	Graduate	Industrial Power Regulations and	Mandatory	3	No
Univ. of Houston	Graduate	Industrial Substations and Switching Equipment	Mandatory	3	No
Univ. of Houston	Graduate	Industrial Power System Protection	Mandatory	3	No
Univ. of Houston	Graduate	Power System Analysis	Mandatory	3	Yes

Univ. of Houston	Graduate	Industrial Power System Management	Mandatory	3	No
Univ. of Houston	Graduate	Power System Transients, Harmonics and Grounding	Elective	3	No
Univ. of Houston	Graduate	Power System Control and Stability	Mandatory	3	No
Univ. of Houston	Graduate	Industrial Power System Analysis	Mandatory	3	No
Univ. of Houston	Graduate	Advanced Power System Analysis	Mandatory	3	No
Univ. of Houston	Undergrad	Compter-Based Electrical System Protection and Safety	Elective	3	No
Univ. of Houston	Undergrad	Power Transmission and Distribution Laboratory	Mandatory	1	Yes
Univ. of Houston	Undergrad	Alternative Electrical Energy Sources and	Elective	3	No
Univ. of Houston	Undergrad	Power Electronics and Electric Drives	Elective	3	No
Univ. of Houston	Undergrad	Computer-Based Power Transmission and	Elective	3	No
Univ. of Houston	Undergrad	Energy Conversion Laboratory	Mandatory	1	Yes
Univ. of Houston	Undergrad	Electrical Power Systems and Industry Practice	Elective	3	No
Univ. of Houston	Undergrad	Power Transmission and Distribution	Mandatory	3	Yes
Univ. of Houston	Undergrad	Poly-Phase Circuits and Transformers and	Elective	4	No
Univ. of Houston	Undergrad	Project Management and Economic Considerations for Power Systems	Elective	3	No
Univ. of Houston	Undergrad	Electromechanical Energy Conversion	Mandatory	3	Yes
Univ. of Houston	Undergrad	Power Converter Circuits	Elective	3	No
Univ. of Houston	Undergrad	Electrical Machines and Laboratory	Elective	4	No
Univ. of Idaho	Graduate	Utility Applications of Power Electronics	Elective	3	No
Univ. of Idaho	Graduate	Power System Stability	Elective	3	No
Univ. of Idaho	Graduate	Transients In Power Systems	Elective	3	No
Univ. of Idaho	Graduate	Dynamics and Control of AC Drives	Elective	3	No
Univ. of Idaho	Graduate	Supervisory Control and Critical Infrastructures	Elective	3	No
Univ. of Idaho	Graduate	Induction Machines	Elective	3	No
Univ. of Idaho	Graduate	Power Systems Protection and Relaying	Elective	3	No
Univ. of Idaho	Graduate	Understanding Power Quality	Elective	3	No
Univ. of Idaho	Graduate	Advanced Electrical Machinery	Elective	3	No
Univ. of Idaho	Graduate	T&D Applications of Voltage Sourced	Elective	3	No
Univ. of Idaho	Graduate	Symmetrical Components	Elective	3	No
Univ. of Idaho	Graduate	Protection of Power Systems II	Elective	3	No
Univ. of Idaho	Undergrad	Energy Systems II	Elective	3	No
Univ. of Idaho	Undergrad	Energy Systems I Lab	Mandatory	1	Yes
Univ. of Idaho	Undergrad	Power Electronics	Elective	3	No
Univ. of Idaho	Undergrad	Introduction to Power Systems	Elective	3	No
Univ. of Idaho	Undergrad	Energy Systems I	Mandatory	3	No
Univ. of Idaho	Undergrad	Power Systems Analysis	Elective	3	No
Univ. of Illinois at Chicago	Graduate	Power Semiconductor Devices and Integrated Circuits	Elective	5	Yes
Univ. of Illinois at Chicago	Graduate	Electromechanical Energy Conversion	Elective	4	Yes
Univ. of Illinois at Chicago	Graduate	Advanced Power- Electronics Design	Elective	4	No
Univ. of Illinois at Chicago	Graduate	Analysis and Design of Power Electronic Circuits	Elective	5	Yes

Univ. of Illinois at Chicago	Undergrad	Analysis and Design of Power Electronic Circuits	Elective	4	Yes
Univ. of Illinois at Chicago	Undergrad	Power Semiconductor Devices and Integrated Circuits	Elective	4	Yes
Univ. of Illinois at Chicago	Undergrad	Electromechanical Energy Conversion	Elective	3	Yes
Univ. of Illinois at Urbana- Champaign	Graduate	Power Systems Operations and Control	Elective	4	No
Univ. of Illinois at Urbana- Champaign	Graduate	Dynamic System Reliability	Elective	4	No
Univ. of Illinois at Urbana- Champaign	Graduate	Analysis Techniques for Large-Scale Electrical Systems	Elective	4	No
Univ. of Illinois at Urbana- Champaign	Graduate	Power System Dynamics and Stability	Elective	4	No
Univ. of Illinois at Urbana- Champaign	Graduate	Modeling and Control of Electromechanical Systems	Elective	4	No
Univ. of Illinois at Urbana- Champaign	Graduate	Electricity Resource Planning	Elective	4	No
Univ. of Illinois at Urbana- Champaign	Undergrad	Electric Machinery	Elective	4	Yes
Univ. of Illinois at Urbana- Champaign	Undergrad	Techniques for Engineering Decision Making	Elective	3	No
Univ. of Illinois at Urbana- Champaign	Undergrad	Power System Analysis	Elective	3	No
Univ. of Illinois at Urbana- Champaign	Undergrad	Power Electronics	Elective	3	No
Univ. of Illinois at Urbana- Champaign	Undergrad	Green Electric Energy	Elective	3	No
Univ. of Illinois at Urbana- Champaign	Undergrad	Interdisciplinary Design	Elective	3	Yes
Univ. of Illinois at Urbana- Champaign	Undergrad	Power Circuits and Electromechanics	Elective	3	No
Univ. of Illinois at Urbana- Champaign	Undergrad	Power Electronics Lab	Elective	2	Yes
Univ. of Illinois at Urbana- Champaign	Undergrad	Advanced Electric Machinery	Elective	3	No
Univ. of Kentucky	Graduate	Electric Power Systems II	Elective	3	No
Univ. of Kentucky	Graduate	Advanced Power System Protection	Elective	3	Yes
Univ. of Kentucky	Graduate	Power System Fundamentals	Elective	3	No
Univ. of Kentucky	Graduate	Power System Fault Analysis and Protection	Elective	3	No
Univ. of Kentucky	Graduate	Power System Analysis Using Advanced Software	Elective	3	No
Univ. of Kentucky	Graduate	Power Distribution Systems	Elective	3	No
Univ. of Kentucky	Graduate	Electric Power Economics and Public Policy	Elective	3	No
Univ. of Kentucky	Graduate	Alternative and Renewable Energy	Elective	3	No
Univ. of Kentucky	Graduate	Electric Power Systems I	Elective	3	No
Univ. of Kentucky	Graduate	Power and Energy Experiences	Elective	3	No
Univ. of Kentucky	Graduate	Advanced Electromechanics	Elective	3	No
Univ. of Kentucky	Graduate	Power Systems: Generation, Operation and Control	Elective	3	No
Univ. of Kentucky	Graduate	Smart Grid: Automation and Control of Power Systems	Elective	3	No
Univ. of Kentucky	Undergrad	Energy Conversion Laboratory	Mandatory	2	Yes
Univ. of Kentucky	Undergrad	Power System Fundamentals	Elective	3	No
Univ. of Kentucky	Undergrad	Power System Analysis Using Advanced Software	Elective	3	Yes
Univ. of Kentucky	Undergrad	Power System Fault Analysis and Protection	Elective	3	No

Univ. of Kentucky	Undergrad	Power Distribution Systems	Elective	3	No
Univ. of Kentucky	Undergrad	Electric Power Economics and Public Policy	Elective	3	No
Univ. of Kentucky	Undergrad	Alternative and Renewable Energy	Elective	3	No
Univ. of Kentucky	Undergrad	Advanced Power System Protection	Elective	3	Yes
Univ. of Kentucky	Undergrad	Electric Power Systems I	Elective	3	No
Univ. of Kentucky	Undergrad	Electromechanics	Mandatory	3	No
Univ. of Kentucky	Undergrad	Advanced Electromechanics	Elective	3	No
Univ. of Kentucky	Undergrad	Smart Grid: Automation and Control of Power Systems	Elective	3	No
Univ. of Kentucky	Undergrad	Power Systems: Generation, Operation and Control	Elective	3	No
Univ. of Kentucky	Undergrad	Electric Power System II	Elective	3	No
Univ. of Maryland College Park	Graduate	Advanced Power Electronics (ENEE 719B)	Elective	3	No
Univ. of Maryland College Park	Graduate	Energy Market Modeling (ENCE 688e)	Elective	3	No
Univ. of Maryland College Park	Graduate	Advanced Power Mechanics (ENME 808A)	Elective	3	No
Univ. of Maryland College Park	Graduate	Energy Systems Analysis (ENME 635)	Elective	3	No
Univ. of Maryland College Park	Undergrad	Power Systems (ENEE 474)	Elective	3	No
Univ. of Maryland College Park	Undergrad	Power Electronics (ENEE 475)	Elective	3	No
Univ. of Maryland College Park	Undergrad	Renewable Energy (ENEE 419R)	Elective	3	No
Univ. of Maryland College Park	Undergrad	Electric Machines Laboratory (ENEE 473)	Elective	2	Yes
Univ. of Memphis	Graduate	Power Distribution System	Elective	3	No
Univ. of Memphis	Graduate	Introduction to Smart Grid	Elective	3	No
Univ. of Memphis	Graduate	Power Electronics	Elective	3	No
Univ. of Memphis	Graduate	Electrical Power Quality	Elective	3	No
Univ. of Memphis	Graduate	Electrical Power Systems	Elective	3	No
Univ. of Memphis	Graduate	Power System Stability/Control	Elective	3	No
Univ. of Memphis	Graduate	Wind Energy Conversion Systems	Elective	3	No
Univ. of Memphis	Undergrad	Electrical Power Quality	Elective	3	No
Univ. of Memphis	Undergrad	Electrical Power Systems	Elective	3	No
Univ. of Memphis	Undergrad	Energy Conversion	Mandatory	4	Yes
Univ. of Memphis	Undergrad	Power Distribution System	Elective	3	No
Univ. of Michigan - Dearborn	Graduate	Introduction to Energy Systems	Elective	3	No
Univ. of Michigan - Dearborn	Graduate	Introduction to Power Management and	Elective	3	No
Univ. of Michigan - Dearborn	Undergrad	Introduction to Electrical Power Systems	Elective	3	No
Univ. of Michigan - Dearborn	Undergrad	Power Electronics	Elective	3	Yes
Univ. of Michigan, Ann Arbor	Graduate	Power Electronic Design	Elective	4	Yes
Univ. of Michigan, Ann Arbor	Graduate	Resonant Converter Topologies	Elective	4	Yes
Univ. of Michigan, Ann Arbor	Graduate	Electromechanics	Elective	4	Yes
Univ. of Michigan, Ann Arbor	Graduate	Advanced Electrical Drive Systems	Elective	4	Yes

Univ. of Michigan, Ann Arbor	Graduate	Electricity Networks and Markets	Elective	3	No
Univ. of Michigan, Ann Arbor	Graduate	Power System Dynamics and Control	Elective	3	No
Univ. of Michigan, Ann Arbor	Graduate	Infrastructure for Vehicle Electrifications	Elective	3	No
Univ. of Michigan, Ann Arbor	Undergrad	Electric Machinery and Drives	Elective	4	Yes
Univ. of Michigan, Ann Arbor	Undergrad	Power System Design and Operation	Elective	4	No
Univ. of Michigan, Ann Arbor	Undergrad	Grid Integration of Alternative Energy	Elective	4	No
Univ. of Michigan, Ann Arbor	Undergrad	Power Electronics	Elective	4	Yes
Univ. of Minnesota - Twin Cities	Graduate	Power System Protection	Elective	2	Yes
Univ. of Minnesota - Twin Cities	Graduate	Advanced Power Electronics	Elective	3	Yes
Univ. of Minnesota - Twin Cities	Graduate	Wind Energy Essentials	Elective	3	No
Univ. of Minnesota - Twin Cities	Graduate	Advanced Electric Drives	Elective	3	Yes
Univ. of Minnesota - Twin Cities	Graduate	Power System Operation and Control	Elective	3	No
Univ. of Minnesota - Twin Cities	Undergrad	Power Systems	Elective	3	Yes
Univ. of Minnesota - Twin Cities	Undergrad	Power Electronics	Elective	3	Yes
Univ. of Minnesota - Twin Cities	Undergrad	Electric Machines and Drives	Elective	3	Yes
Univ. of Minnesota - Twin Cities	Undergrad	Power Systems Lab	Mandatory	1	Yes
Univ. of Minnesota - Twin Cities	Undergrad	Power Electronics Lab	Elective	1	Yes
Univ. of Minnesota - Twin Cities	Undergrad	Electric Drives Lab	Elective	1	Yes
Univ. of Missouri - Kansas City	Graduate	Power System Transmission Planning	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Reliability of Electric Power Systems	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Direct Current Power Systems	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Auxiliary Electric Systems Design	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Solar Photovoltaic Systems Engineering	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Electric Power Distribution Systems	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Lightning and Switching Surges in Power Systems	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Economics of Power Systems	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Power Systems Relaying	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Energy Systems for Engineering	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Power Quality	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Electric Power Lab	Elective	3	Yes
Univ. of Missouri - Kansas City	Graduate	Power Systems II	Mandatory	3	No

Univ. of Missouri - Kansas City	Graduate	Advanced Computer Methods in Power System Analysis	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Automatic Control Systems Design	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Sustainable Energy Systems in Engineering	Elective	3	No
Univ. of Missouri - Kansas City	Graduate	Power Plant Instrumentation and Control	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Automatic Control Systems Design	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Power Systems I	Mandatory	3	No
Univ. of Missouri - Kansas City	Undergrad	Introduction to Control Systems	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Electric Power Distribution Systems	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Energy Systems for Engineering	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Advanced Sustainable Energy System Engineering	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Electric Power Lab	Elective	3	Yes
Univ. of Missouri - Kansas City	Undergrad	Reliability of Electric Power Systems	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Power Electronics I	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Power Quality	Elective	3	No
Univ. of Missouri - Kansas City	Undergrad	Power Systems II	Elective	3	No
Univ. of Nebraska - Lincoln	Graduate	Power System Operation and Control	Elective	3	No
Univ. of Nebraska - Lincoln	Graduate	Power Semiconductor Devices	Elective	3	No
Univ. of Nebraska - Lincoln	Graduate	Power System Reliability	Elective	3	No
Univ. of Nebraska - Lincoln	Graduate	Advanced Computer Methods In Power	Elective	3	No
Univ. of Nebraska - Lincoln	Graduate	Computational Intelligence	Elective	3	No
Univ. of Nebraska - Lincoln	Graduate	Advanced Power Electronics and	Elective	3	No
Univ. of Nebraska - Lincoln	Undergrad	Power System Planning	Elective	3	No
Univ. of Nebraska - Lincoln	Undergrad	Power Electronics	Elective	3	Yes
Univ. of Nebraska - Lincoln	Undergrad	Power System Analysis	Elective	3	No
Univ. of Nebraska - Lincoln	Undergrad	Wind Energy	Elective	3	No
Univ. of Nebraska - Lincoln	Undergrad	Electric Machines	Elective	3	No
Univ. of Nebraska - Lincoln	Undergrad	Introduction to Electric Power Engineering	Elective	3	No
Univ. of Nebraska - Lincoln	Undergrad	Solar Energy	Elective	3	No
Univ. of Nevada, Reno	Graduate	Computer Method in Power Engineering: State	Elective	3	No
Univ. of Nevada, Reno	Graduate	Electric Drives	Elective	3	No
Univ. of Nevada, Reno	Graduate	Power Electronics	Elective	3	No

Univ. of Nevada, Reno	Graduate	Power System Operation with Renewable Energy Sources	Elective	3	No
Univ. of Nevada, Reno	Graduate	Electrical Machines	Elective	3	No
Univ. of Nevada, Reno	Undergrad	Power Systems Analysis	Elective	3	No
Univ. of Nevada, Reno	Undergrad	Power Electronics	Elective	3	No
Univ. of Nevada, Reno	Undergrad	Power System Fundamentals	Mandatory	3	No
Univ. of Nevada, Reno	Undergrad	Electric Power Distribution	Elective	3	No
Univ. of Nevada, Reno	Undergrad	Electrical Machines	Elective	3	No
Univ. of Nevada, Reno	Undergrad	Power System Protection	Elective	3	No
Univ. of North Carolina at Charlotte	Graduate	Power System Stability and Control	Elective	3	No
Univ. of North Carolina at Charlotte	Graduate	Power System Relaying	Elective	3	No
Univ. of North Carolina at Charlotte	Graduate	Energy Markets	Elective	3	No
Univ. of North Carolina at Charlotte	Graduate	Distribution Systems I	Elective	3	No
Univ. of North Carolina at Charlotte	Graduate	Electric Machines	Elective	3	No
Univ. of North Carolina at Charlotte	Graduate	Smart Grid	Elective	3	No
Univ. of North Carolina at Charlotte	Graduate	Energy Systems	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Energy Systems	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Power Systems I	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Power Generation, Operation and Control	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Power Electronics	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Power Systems II	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Electromagnetic Devices	Elective	3	Yes
Univ. of North Carolina at Charlotte	Undergrad	Energy Markets	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Utility Applications of Power Electronics	Elective	3	No
Univ. of North Carolina at Charlotte	Undergrad	Electric Machines	Elective	3	No
Univ. of North Dakota	Graduate	Renewable Energy Systems	Elective	3	No
Univ. of North Dakota	Graduate	Power Electronics	Elective	3	Yes
Univ. of North Dakota	Graduate	Power Systems I	Elective	3	No
Univ. of North Dakota	Graduate	Engineering System Reliability	Elective	3	No
Univ. of North Dakota	Graduate	Power Systems II	Elective	3	No
Univ. of North Dakota	Undergrad	Engineering Systems Reliability	Elective	3	No
Univ. of North Dakota	Undergrad	Electric Drives	Mandatory	3	Yes
Univ. of North Dakota	Undergrad	Electric Power Systems I	Elective	3	No
Univ. of North Dakota	Undergrad	Renewable Energy Systems	Elective	3	No
Univ. of North Dakota	Undergrad	Power Electronics	Elective	3	Yes
Univ. of North Dakota	Undergrad	Electric Power Systems II	Elective	3	No
Univ. of Oklahoma	Graduate	Power System and Market Operation	Elective	3	No
Univ. of Oklahoma	Undergrad	Power System Dynamics	Elective	9	No
Univ. of Oklahoma	Undergrad	Energy Conversion	Mandatory	9	No
Univ. of Oklahoma	Undergrad	Transmission System Analysis	Elective	9	No
Univ. of Oklahoma	Undergrad	Power System Operation	Elective	9	No

Univ. of Pittsburgh	Graduate	Power System Steady- State Control	Elective	3	No
Univ. of Pittsburgh	Graduate	Power System Transients II	Elective	3	No
Univ. of Pittsburgh	Graduate	Embedded Systems	Elective	3	No
Univ. of Pittsburgh	Graduate	Power Electronics Circuits and Applications	Elective	3	No
Univ. of Pittsburgh	Graduate	Protective Relaying and Substation Automation	Elective	3	Yes
Univ. of Pittsburgh	Graduate	Smart Grid Technologies and Applications	Elective	3	Yes
Univ. of Pittsburgh	Graduate	Linear System Theory	Elective	3	No
Univ. of Pittsburgh	Graduate	Power System Engineering and Analysis	Elective	3	No
Univ. of Pittsburgh	Graduate	Stochastic Processes	Elective	3	No
Univ. of Pittsburgh	Graduate	Renewable and Alternative Energy	Elective	3	No
Univ. of Pittsburgh	Graduate	Sustainable Power System Modeling	Elective	3	No
Univ. of Pittsburgh	Graduate	Power System Stability	Elective	3	No
Univ. of Pittsburgh	Graduate	Optimization Methods	Elective	3	No
Univ. of Pittsburgh	Graduate	Power System Transients I	Elective	3	No
Univ. of Pittsburgh	Graduate	Electric Distribution Engineering II	Elective	3	No
Univ. of Pittsburgh	Graduate	FACTS and HVDC Technologies and	Elective	3	No
Univ. of Pittsburgh	Undergrad	Electrical Power Transmission, Distribution, and Grid	Elective	3	No
Univ. of Pittsburgh	Undergrad	Electric Distribution Engineering and Smart	Elective	3	Yes
Univ. of Pittsburgh	Undergrad	Power System Engineering and Analysis I	Mandatory	3	No
Univ. of Pittsburgh	Undergrad	Introduction to Nuclear Engineering	Elective	3	No
Univ. of Pittsburgh	Undergrad	Electric Machinery	Elective	3	Yes
Univ. of Pittsburgh	Undergrad	Construction and Cost of Electrical Supply	Elective	3	No
Univ. of Pittsburgh	Undergrad	Linear Control Systems	Mandatory	3	No
Univ. of Pittsburgh	Undergrad	Thermodynamics	Elective	3	No
Univ. of Pittsburgh	Undergrad	Power Generation, Operation, and Control	Elective	3	No
Univ. of Pittsburgh	Undergrad	Power Electronics	Elective	3	No
Univ. of Portland	Undergrad	Electric Power Systems	Elective	3	No
Univ. of Portland	Undergrad	Automatic Control Systema	Elective	3	No
Univ. of Portland	Undergrad	Energy Conversion	Elective	3	No
Univ. of Saskatchewan	Graduate	Power System Reliability	Elective	3	No
Univ. of Saskatchewan	Graduate	Power Systems Modeling and Control	Elective	3	No
Univ. of Saskatchewan	Graduate	Economic System Operation	Elective	3	No
Univ. of Saskatchewan	Graduate	Reliability Engineering	Elective	3	No
Univ. of Saskatchewan	Graduate	Power Systems Protection and Relaying	Elective	3	No
Univ. of Saskatchewan	Graduate	Power Systems Analysis	Elective	3	No
Univ. of Saskatchewan	Undergrad	Power Systems Analysis	Mandatory	3	Yes
Univ. of Saskatchewan	Undergrad	Introduction to Electric Power Systems	Mandatory	3	Yes
Univ. of Saskatchewan	Undergrad	Basic Electronics and Electric Power	Mandatory	3	Yes
Univ. of Saskatchewan	Undergrad	Power Systems Operation and Control	Mandatory	3	Yes
Univ. of Saskatchewan	Undergrad	Transmission of Electrical Energy	Mandatory	3	Yes
Univ. of Saskatchewan	Undergrad	Electric Machines Fundamentals	Mandatory	3	Yes
Univ. of Saskatchewan	Undergrad	Power Electronics	Mandatory	3	Yes

Univ. of Saskatchewan	Undergrad	Advanced Analysis of Electric Machines and	Mandatory	3	Yes
Univ. of South Carolina	Graduate	Power System Grounding and Transients	Elective	3	No
Univ. of South Carolina	Graduate	Advanced Power Electronics	Elective	3	No
Univ. of South Carolina	Graduate	Advanced Power Systems Analysis	Elective	3	No
Univ. of South Carolina	Graduate	Power Systems Stability and Control	Elective	3	No
Univ. of South Carolina	Undergrad	Industrial Controls	Elective	3	No
Univ. of South Carolina	Undergrad	Electromechanica Energy Convresion	Elective	3	No
Univ. of South Carolina	Undergrad	Digital Control Systems	Elective	3	No
Univ. of South Carolina	Undergrad	Power Electronics	Elective	3	No
Univ. of South Carolina	Undergrad	Power Systems Design and Analysis	Elective	3	No
Univ. of South Florida	Graduate	Power Systems II	Elective	3	No
Univ. of South Florida	Graduate	Electric Distribution Systems	Elective	3	No
Univ. of South Florida	Graduate	Power System Market: Operation and Analysis	Elective	3	No
Univ. of South Florida	Graduate	Power Electronics	Elective	3	No
Univ. of South Florida	Graduate	Power Quality	Elective	3	No
Univ. of South Florida	Graduate	Power System Analysis	Elective	3	No
Univ. of South Florida	Graduate	Electric Machines and Drives	Elective	3	No
Univ. of South Florida	Graduate	Power System Protection	Elective	3	No
Univ. of South Florida	Undergrad	Power System Protection	Elective	3	No
Univ. of South Florida	Undergrad	Electromechanical Systems	Mandatory	3	Yes
Univ. of South Florida	Undergrad	Power Quality	Elective	3	No
Univ. of South Florida	Undergrad	Electric Distribution Systems	Elective	3	No
Univ. of South Florida	Undergrad	Power Electronics	Elective	3	No
Univ. of South Florida	Undergrad	Power System Analysis	Elective	3	No
Univ. of South Florida	Undergrad	Power Systems II	Elective	3	No
Univ. of Southern Maine	Undergrad	Energy and Power Systems (ELE 327)	Elective	3	No
Univ. of Southern Maine	Undergrad	Electromechanical Energy Conversion (ELE 323)	Mandatory	4	Yes
Univ. of Tennessee, Knoxville	Graduate	Alternative Energy Sources	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Advanced Power Electronics and Drives	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Advanced Power Grid Protection	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Power Systems Analysis II	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Ultra-Wide-Area Resilient Electrical Energy Transmission Networks	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Utility Applications of Power Electronics	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Power Electronics Technologies	Elective	3	Yes
Univ. of Tennessee, Knoxville	Graduate	Power Electronics and Drives	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Power System Economics	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Solid State Power Semiconductor	Elective	3	No
Univ. of Tennessee, Knoxville	Graduate	Power Systems Analysis I	Elective	3	No
Univ. of Tennessee, Knoxville	Undergrad	Electric Energy Systems	Elective	3	No

Univ. of Tennessee, Knoxville	Undergrad	Power Electronic Circuits	Elective	3	Yes
Univ. of Tennessee, Knoxville	Undergrad	Electric Energy Systems Components	Mandatory	3	No
Univ. of Tennessee, Knoxville	Undergrad	Power System Operations and Planning	Elective	3	No
Univ. of Tennessee, Knoxville	Undergrad	Power Electronics	Elective	3	No
Univ. of Texas at Arlington	Graduate	Power System Modeling And Analysis	Elective	3	No
Univ. of Texas at Arlington	Graduate	Power System Planning, Operation, and Control In Deregulated Environment	Elective	3	No
Univ. of Texas at Arlington	Graduate	Power System Protective Relaying	Elective	3	No
Univ. of Texas at Arlington	Graduate	Electric Motor Drive	Elective	3	No
Univ. of Texas at Arlington	Graduate	Power Electronics	Elective	3	No
Univ. of Texas at Arlington	Graduate	Congestion Management	Elective	3	No
Univ. of Texas at Arlington	Graduate	Renewable Energy System	Elective	3	No
Univ. of Texas at Arlington	Graduate	Grid Integration of Renewable Energy	Elective	3	No
Univ. of Texas at Arlington	Undergrad	Foundamenal of Power Systems	Elective	4	Yes
Univ. of Texas at Arlington	Undergrad	Introduction to Power Electronics	Elective	4	Yes
Univ. of Texas at Austin	Graduate	Energy Systems	Elective	3	No
Univ. of Texas at Austin	Graduate	Power Systems Apparatus and	Elective	3	Yes
Univ. of Texas at Austin	Graduate	Topics in Power System Engineering	Elective	3	No
Univ. of Texas at Austin	Graduate	Restructured Electricity Markets	Elective	3	No
Univ. of Texas at Austin	Undergrad	Electric Drives and Machines	Elective	3	No
Univ. of Texas at Austin	Undergrad	Power Systems Engineering	Elective	3	No
Univ. of Texas at Austin	Undergrad	Power Quality and Harmonics	Elective	3	No
Univ. of Texas at Austin	Undergrad	Power Electronics Laboratory	Elective	4	Yes
Univ. of Texas at Austin	Undergrad	Power Systems Apparatus and	Elective	3	Yes
Univ. of Texas at El Paso	Graduate	Power Systems Operations and Markets	Elective	3	Yes
Univ. of Texas at El Paso	Undergrad	Introduction to Electric Power Systems	Elective	3	Yes
Univ. of the Pacific	Graduate	Topics In Renewable Energy	Elective	3	No
Univ. of the Pacific	Undergrad	Power System Analysis	Elective	3	No
Univ. of the Pacific	Undergrad	Energy Conversion	Elective	4	Yes
Univ. of the Pacific	Undergrad	Power Electronics	Elective	4	Yes
Univ. of Toronto	Graduate	Power System Optimization	Elective	1	No
Univ. of Toronto	Graduate	Design of High-Frequency Switch-Mode Power Supplies I	Elective	1	No
Univ. of Toronto	Graduate	Smart Grid Case Studies	Elective	1	No
Univ. of Toronto	Graduate	Power Management for Photovoltaic Systems	Elective	1	No
Univ. of Toronto	Graduate	Space Vector Theory and Control	Elective	1	Yes
Univ. of Toronto	Graduate	Dynamics of HVdc-ac Transmission Systems	Elective	1	No
Univ. of Toronto	Graduate	HVDC Transmission Systems	Elective	1	No
Univ. of Toronto	Undergrad	Energy Systems and Distributed Generation	Elective	3	Yes

Univ. of Toronto	Undergrad	Power Electronics: Converter Topologies	Elective	3	Yes
Univ. of Toronto	Undergrad	Electric Drives	Elective	3	Yes
Univ. of Toronto	Undergrad	Power Electronics: Switch- Mode Power Supplies	Elective	3	Yes
Univ. of Toronto	Undergrad	Fundamentals of Electrical Energy Systems	Elective	3	Yes
Univ. of Toronto	Undergrad	Introduction to Lighting Systems	Elective	3	No
Univ. of Toronto	Undergrad	Introduction to Energy Systems	Mandatory	3	Yes
Univ. of Utah	Graduate	Power System Protection	Elective	3	No
Univ. of Utah	Graduate	Sustainable Energy Sources	Elective	3	No
Univ. of Utah	Graduate	Control of Electric Motors	Elective	3	Yes
Univ. of Utah	Graduate	Utility Applications of Power Electronics	Elective	3	No
Univ. of Utah	Graduate	Electrical Forensics and Failure Analysis	Elective	3	No
Univ. of Utah	Undergrad	Electrical Forensics and Failure Analysis	Elective	3	No
Univ. of Utah	Undergrad	Control of Electric Motors	Elective	3	Yes
Univ. of Utah	Undergrad	Introduction to Electric Power Engineering	Elective	3	Yes
Univ. of Utah	Undergrad	Power Electronics Fundamentals	Elective	4	Yes
Univ. of Utah	Undergrad	Power System Protection	Elective	3	No
Univ. of Utah	Undergrad	Power Systems Analysis	Elective	3	No
Univ. of Vermont	Graduate	Electric Energy Systems Analysis	Elective	3	No
Univ. of Vermont	Graduate	Smarter Electric Energy Systems	Elective	3	No
Univ. of Vermont	Undergrad	Electric Energy Systems Analysis	Elective	3	No
Univ. of Vermont	Undergrad	Introduction to Electric Energy Systems	Elective	4	Yes
Univ. of Washington	Graduate	Wind Energy	Elective	4*	No
Univ. of Washington	Graduate	Large Electric Energy Systems Analysis	Elective	4*	No
Univ. of Washington	Graduate	Power System Dynamics and Control	Elective	4*	No
Univ. of Washington	Graduate	Special Topics in Energy Systems	Elective	4*	No
Univ. of Washington	Graduate	Power System Economics	Elective	4*	No
Univ. of Washington	Graduate	Distribution Networks	Elective	4*	No
Univ. of Washington	Undergrad	Power Electronics Design	Elective	5*	Yes
Univ. of Washington	Undergrad	Power System Dynamics and Protection	Elective	4*	No
Univ. of Washington	Undergrad	Introduction to Electric Energy Devices and	Elective	5*	Yes
Univ. of Washington	Undergrad	Electric Drives	Elective	5*	Yes
Univ. of Washington	Undergrad	Computer-Aided Design in Power Systems	Elective	4*	No
Univ. of Washington	Undergrad	Wind Energy	Elective	4*	No
Univ. of Washington	Undergrad	Power System Analysis	Elective	4*	No
Univ. of Washington	Undergrad	Electric Energy Distribution Systems	Elective	4*	No
Univ. of Waterloo	Graduate	Power System Protection	Elective	3*	No
Univ. of Waterloo	Graduate	Power Systems Operation	Elective	3*	No
Univ. of Waterloo	Graduate	Electric Safety and Grounding System Design	Elective	3*	No
Univ. of Waterloo	Graduate	Dielectric Materials	Elective	3*	Yes
Univ. of Waterloo	Graduate	HVDC and FACTS	Elective	3*	No
Univ. of Waterloo	Graduate	Electric Machines and Motor Drives	Elective	3*	No
Univ. of Waterloo	Graduate	Electromagnetic Compatibility and Power	Elective	3*	No

Univ. of Waterloo	Graduate	Power System Components and	Elective	3*	No
Univ. of Waterloo	Graduate	Industrial Utilization of Electrical Energy	Elective	3*	No
Univ. of Waterloo	Graduate	Operation of Restructured Power	Elective	3*	No
Univ. of Waterloo	Graduate	Sustainable Distributed Generation	Elective	3*	No
Univ. of Waterloo	Graduate	Medium and HV Power Cables	Elective	3*	No
Univ. of Waterloo	Graduate	Power System Quality	Elective	3*	No
Univ. of Waterloo	Graduate	Power System Analysis and Control	Elective	3*	No
Univ. of Waterloo	Graduate	FACTS: Models, Controls and Applications	Elective	3*	No
Univ. of Waterloo	Graduate	Distributed Generation	Elective	3*	No
Univ. of Waterloo	Graduate	High Voltage Engineering Applications	Elective	3*	Yes
Univ. of Waterloo	Graduate	Design and Application of DC/DC Converters	Elective	3*	No
Univ. of Waterloo	Graduate	Dielectrics and Electrical Insulation	Elective	3*	No
Univ. of Waterloo	Graduate	Distribution Systems Engineering	Elective	3*	No
Univ. of Waterloo	Graduate	Power Electronics Converters: Design and	Elective	3*	No
Univ. of Waterloo	Graduate	Power System Management and	Elective	3*	No
Univ. of Waterloo	Graduate	Energy Processing	Elective	3*	No
Univ. of Waterloo	Graduate	Asset Management and Risk Assessment of Power Systems	Elective	3*	No
Univ. of Waterloo	Undergrad	Power Systems and Components	Mandatory	3*	Yes
Univ. of Waterloo	Undergrad	Design and Applications of Power Electronic Converters	Elective	3*	Yes
Univ. of Waterloo	Undergrad	High Voltage Engineering and Power System Protection	Elective	3*	Yes
Univ. of Waterloo	Undergrad	Electrical Distribution Systems	Elective	3*	No
Univ. of Waterloo	Undergrad	Power System Analysis, Operations and Markets	Elective	3*	No
Univ. of Western Ontario	Graduate	Computer-based Power Systems Protection	Elective	3	No
Univ. of Western Ontario	Graduate	High Frequency Power Electronic Converters	Elective	3	No
Univ. of Western Ontario	Graduate	Theory and Application of Protective Relays	Elective	3	No
Univ. of Western Ontario	Graduate	Flexible AC Transmission Systems FACTS	Elective	3	No
Univ. of Western Ontario	Undergrad	Conventional, Renewable and Nuclear Energy	Mandatory	3	No
Univ. of Western Ontario	Undergrad	Electric Power Systems II	Mandatory	3	Yes
Univ. of Western Ontario	Undergrad	Power System Protection	Mandatory	3	Yes
Univ. of Western Ontario	Undergrad	Electric Power Systems I	Mandatory	3	Yes
Univ. of Western Ontario	Undergrad	Power Electronics	Mandatory	3	Yes
Univ. of Wisconsin - Madison	Graduate	Electromagnetic Design of AC Machines	Elective	3	Yes
Univ. of Wisconsin - Madison	Graduate	Advanced Power System Analysis	Elective	3	No
Univ. of Wisconsin - Madison	Graduate	Power Electronics Laboratory	Elective	3	Yes
Univ. of Wisconsin - Madison	Graduate	Utility Application of Power Electronics	Elective	3	Yes

Univ. of Wisconsin - Madison	Graduate	Electric Machines Laboratory	Elective	3	Yes
Univ. of Wisconsin - Madison	Graduate	Dynamics and Controls of AC Drives	Elective	3	Yes
Univ. of Wisconsin - Madison	Graduate	Solid State Power Conversion	Elective	3	Yes
Univ. of Wisconsin - Madison	Graduate	On-Line Control of Power Systems	Elective	3	No
Univ. of Wisconsin - Madison	Graduate	Theory and Control of Synchronous Machines	Elective	3	Yes
Univ. of Wisconsin - Madison	Graduate	Power Electronic Systems for Sustainable Energy	Elective	3	No
Univ. of Wisconsin - Madison	Undergrad	Electric Power Processing for Alternative Energy Systems	Elective	3	No
Univ. of Wisconsin - Madison	Undergrad	Electric Power Systems	Elective	3	No
Univ. of Wisconsin - Madison	Undergrad	Transmission Lines and Networks Laboratory	Elective	1	Yes
Univ. of Wisconsin - Madison	Undergrad	Fundamentals of Electrical and Electro-mechanical Power	Elective	4	No
Univ. of Wisconsin - Madison	Undergrad	Introduction to Electric Drive Systems	Elective	3	Yes
Univ. of Wisconsin - Madison	Undergrad	Electromechanical Energy Conversion	Elective	3	No
Univ. of Wisconsin - Madison	Undergrad	Power Electronic Circuits	Elective	3	Yes
Univ. of Wyoming	Graduate	Signal Processing for Power Systems Analysis	Elective	3	No
Univ. of Wyoming	Graduate	Power Engineering (EE 5700)	Elective	3	No
Univ. of Wyoming	Graduate	Electrical Power Quality (EE 5885)	Elective	3	No
Univ. of Wyoming	Undergrad	Electrodynamics (EE4550)	Elective	3	No
Univ. of Wyoming	Undergrad	Power Electronics (EE4560)	Elective	3	No
Univ. of Wyoming	Undergrad	Power System Analysis (EE4510)	Elective	3	No
Univ. of Wyoming	Undergrad	Electromechanics (EE3510)	Mandatory	4	Yes
Valparaiso Univ.	Graduate	None	Elective	0	No
Valparaiso Univ.	Undergrad	Transmission and Distribution	Elective	3	Yes
Villanova Univ.	Graduate	Electric Machines	Mandatory	3	No
Villanova Univ.	Graduate	Power Electronics	Elective	3	No
Villanova Univ.	Graduate	Power System Modeling	Mandatory	3	No
Villanova Univ.	Graduate	Renewable Energy Systems	Elective	3	No
Villanova Univ.	Graduate	Introduction to Electric Drives	Elective	3	No
Villanova Univ.	Graduate	Control Systems	Mandatory	3	No
Villanova Univ.	Graduate	Introduction to Power Electronics	Elective	3	No
Villanova Univ.	Undergrad	Electric Machines	Elective	3	No
Villanova Univ.	Undergrad	Introduction to Electric Energy Systems	Mandatory	3	No
Virginia Polytechnic Institute and State Univ.	Graduate	Power Systems Planning	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Graduate	Advanced Instrumentation in Power Systems	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Graduate	Advanced Alternative Energy Systems	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Graduate	Computational Methods in Power Engineering	Elective	3	No

Virginia Polytechnic Institute and State Univ.	Graduate	Power System Operation and Control	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Graduate	Advanced Topics in Power	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Undergrad	Power System Analysis and Control	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Undergrad	Power Laboratory	Mandatory	1	Yes
Virginia Polytechnic Institute and State Univ.	Undergrad	Design In Power Engineering	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Undergrad	Power System Protection	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Undergrad	Alternative Energy	Elective	3	No
Virginia Polytechnic Institute and State Univ.	Undergrad	Introduction to Power Engineering	Mandatory	3	No
Virginia Polytechnic Institute and State Univ.	Undergrad	Protection Lab	Elective	1	Yes
Washington State Univ.	Graduate	Advanced Power Electronics	Elective	3	No
Washington State Univ.	Graduate	Advanced Topics (Mani)	Elective	3	No
Washington State Univ.	Graduate	Power System Economics and Electricity Markets	Elective	3	No
Washington State Univ.	Graduate	Analysis of Power System	Mandatory	3	No
Washington State Univ.	Graduate	Critical Infrastructure Security: The Emerging Smart Grid	Elective	3	No
Washington State Univ.	Graduate	Power System Transmission	Elective	3	No
Washington State Univ.	Graduate	Power Systems Stability and Control	Mandatory	3	No
Washington State Univ.	Graduate	Advanced Topics (Bose)	Elective	3	No
Washington State Univ.	Graduate	Protection of Power Systems II	Elective	3	No
Washington State Univ.	Undergrad	Performance of Power Systems	Elective	3	No
Washington State Univ.	Undergrad	Protection of Power Systems I	Elective	3	No
Washington State Univ.	Undergrad	Electrical Power Systems	Mandatory	3	No
Washington State Univ.	Undergrad	Renewable Energy	Elective	3	No
Washington State Univ.	Undergrad	Protective Relay Lab	Elective	2	Yes
Washington State Univ.	Undergrad	Power Systems Lab	Mandatory	2	Yes
Washington State Univ.	Undergrad	Power Electronics	Elective	3	No
Washington State Univ.	Undergrad	Distribution Systems	Elective	3	No
Wayne State Univ.	Graduate	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Graduate	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Graduate	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Graduate	Energy Systems Engineering	Elective	4	No
Wayne State Univ.	Graduate	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Graduate	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Graduate	Integration of Alternative Energy Systems	Elective	4	No
Wayne State Univ.	Graduate	Energy Systems Engineering	Elective	4	No
Wayne State Univ.	Graduate	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Graduate	Energy Systems Engineering	Elective	4	No

Wayne State Univ.	Graduate	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Graduate	Power Management of Energy Storage Systems	Elective	4	No
Wayne State Univ.	Undergrad	Introduction to Power Electronics	Elective	3	No
Wayne State Univ.	Undergrad	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Undergrad	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Undergrad	Power Management of Energy Storage Systems	Elective	4	No
Wayne State Univ.	Undergrad	Energy Systems Engineering	Elective	4	No
Wayne State Univ.	Undergrad	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Undergrad	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Undergrad	Introduction to Power Electronics	Elective	4	No
Wayne State Univ.	Undergrad	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Undergrad	Energy Systems Engineering	Elective	4	No
Wayne State Univ.	Undergrad	Electric Machines and Power Systems	Elective	3	No
Wayne State Univ.	Undergrad	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Undergrad	Power Electronics and Control	Elective	4	No
Wayne State Univ.	Undergrad	Integration of Alternative Energy	Elective	4	No
Wayne State Univ.	Undergrad	Energy Systems Engineering	Elective	4	No
West Virginia Univ.	Graduate	Advanced Electrical Machinery (EE 531)	Elective	3	No
West Virginia Univ.	Graduate	Protection of Power Systems (EE 733)	Elective	3	No
West Virginia Univ.	Graduate	Computer Applications in Power System Analysis (EE 533)	Elective	3	No
West Virginia Univ.	Graduate	Large-Scale System Modeling Continued EE	Elective	3	No
West Virginia Univ.	Undergrad	Introduction to Power Electronics (EE 435)	Elective	3	No
West Virginia Univ.	Undergrad	Electromechanical Energy Conversion and Systems	Mandatory	3	Yes
West Virginia Univ.	Undergrad	Electrical Power Distribution Systems	Elective	3	No
Western Carolina Univ.	Graduate	Advanced Power System Analysis	Mandatory	3*	No
Western Carolina Univ.	Undergrad	Electric Power Systems	Mandatory	3*	No
Western Carolina Univ.	Undergrad	Power Electronics	Mandatory	3*	No
Wichita State Univ.	Graduate	Motors and Drives	Elective	3	Yes
Wichita State Univ.	Graduate	Operation and Control	Elective	3	No
Wichita State Univ.	Graduate	Protection	Elective	3	No
Wichita State Univ.	Graduate	Markets	Elective	3	No
Wichita State Univ.	Graduate	Electric Power Distribution	Elective	3	No
Wichita State Univ.	Graduate	Electric Power Quality	Elective	3	No
Wichita State Univ.	Graduate	Reliability	Elective	3	No
Wichita State Univ.	Graduate	Integration of Renewables	Elective	3	No
Wichita State Univ.	Graduate	Smart Grid	Elective	3	No
Wichita State Univ.	Undergrad	Smart Grids	Elective	3	No
Wichita State Univ.	Undergrad	Electric Power Systems Analysis II	Elective	3	No
Wichita State Univ.	Undergrad	Electric Machinery and Power Systems	Mandatory	4	Yes
Wichita State Univ.	Undergrad	Power Electronics	Elective	4	Yes
Wichita State Univ.	Undergrad	Electric Power Systems Analysis I	Elective	3	No
Worcester Polytechnic Institute	Graduate	Power Distribution	Elective	3	No
Worcester Polytechnic Institute	Graduate	Capstone Project in Power Systems	Elective	3	No
Worcester Polytechnic Institute	Graduate	Electromechanical Energy Conversion	Elective	3	No

Worcester Polytechnic Institute	Graduate	Power System Analysis	Mandatory	3	No
Worcester Polytechnic Institute	Graduate	Advanced Applications in Protective Relaying	Elective	3	No
Worcester Polytechnic Institute	Graduate	Power System Operation and Planning	Elective	3	No
Worcester Polytechnic Institute	Graduate	Power System Protection and Control	Elective	3	No
Worcester Polytechnic Institute	Graduate	Power System Dynamics	Elective	3	No
Worcester Polytechnic Institute	Graduate	Power Transmission	Elective	3	No
Worcester Polytechnic Institute	Graduate	Transients in Power Systems	Elective	3	No
Worcester Polytechnic Institute	Graduate	Protective Relaying	Elective	3	No
Worcester Polytechnic Institute	Undergrad	Electrical Energy Conversion	Elective	3	No
Worcester Polytechnic Institute	Undergrad	Power Electronics	Elective	3	Yes
Worcester Polytechnic Institute	Undergrad	Introduction to Contemporary Electric Power Systems	Elective	3	No

2.2 ĐH Thanh Hoa, Trung Quốc

2.2.1 Các môn undergrad

[30220323 \(High Voltage Engineering\)](#)

[30220334 \(Electric Machinery Fundamentals\)](#)

[30220351 \(Experiments for Electric Machinery\)](#)

[30220403 \(Fundamentals of Communication Systems\)](#)

[30220414 \(Fundamentals of Power Electronics\)](#)

[40220063 \(Fundamentals of Protective Relaying Technology\)](#)

[40220072 \(Modern Electrical Power Plant Engineering\)](#)

[40220341 \(Experiments for Power System\)](#)

[40220392 \(Electric Power Dispatch Automation\)](#)

[40220432 \(Overvoltages and Its Protection\)](#)

[40220442 \(Power System Stability and Control\)](#)

[40220452 \(Power Electronics Simulation\)](#)

[40220462 \(Fundamental and Application of Power Apparatus\)](#)

[40220472 \(Condition Monitoring and Fault Diagnosis of Electrical Equipment\)](#)

[40220502 \(Lectures on Advances in Electrical Engineering\)](#)

[40220590 \(Comprehensive Thesis Training\)](#)

[40220692 \(Introduction on Electricity Market\)](#)

[40220723 \(Power System Analysis\)](#)

[40220762 \(Dielectric materials and insulation technology\)](#)

[40220772 \(Microprocessor based Protective Relaying and Automatic Control Technology\)](#)

[40220782 \(Information theory and power system\)](#)

[40220793 \(DC Power Transmission Technology\)](#)

[40220802 \(Power System Forecasting\)](#)

[40220812 \(Power Transmission and Distribution\)](#)

2.2.2 Các môn học grad, Thanh Hoa

[60220033 \(Micro-Controller: Principle and Application\)](#)

[64030013\(Stochastic Processing of Random Signals\)](#)

[64030023 \(Digital Signal Processing\)](#)

[70220013 \(Advanced Circuits and Systems\)](#)

[70220022 \(Computation of Electromagnetic Fields\)](#)

[70220042 \(Advanced Electric Power Network Analysis\)](#)

[70220062 \(Gas Discharge\)](#)

[70220082 \(Transient Analysis of AC Machine Systems\)](#)

[70220092 \(Electromagnetic Measurements Selection\)](#)

[70220122 \(Modern Power Electronics\)](#)

[70220123 \(Modern Power Electronics: Principle & Applications\)](#)

[70220132 \(Modern Control Theory\)](#)

[70220152 \(Electrical Equipment Reliability Engineering\)](#)

[70228143 \(Theory and Methods of Electrical Power System Planning\)\(E\)](#)

[70228023 \(Power System Analysis and Control\)](#)

[70228113 \(Electromagnetic Field\)](#)

[70228123 \(Modern Lightning Protection\)](#)

[70228143 \(Theory and Methods of Electrical Power System Planning\)\(E\)](#)

[80220012 \(New Technical Trend of Electro-technology and Electrical Power System\)](#)

[80220023 \(Modern High Voltage Test Technology\)](#)

[80220032 \(Introduction to Pulsed Power Technology\)](#)

[80220092 \(Advanced Electromagnetic Compatibility\)](#)

[80220112 \(Modern Communications in Electric Power Systems\)](#)

[80220122 \(Integration of Power Electronics and Motor Drive System\)](#)

[80220132 \(FACTS/DFACTS: Principles and Applications\)](#)

[80220142 \(LabVIEW Programming and Virtual Instruments Design\)](#)

[80220152 \(Evolutionary Computation and Its Applications\)](#)

[80220162 \(Electromagnetic Transient Analysis\)](#)

[80220172 \(Uncertainty Analysis of Electrical Power System\)](#)

[80220202 \(Wide Area Monitoring and Control of Power Systems\)](#)

[80220211 \(Simulation in Electrical Engineering\)](#)

[80220222 \(Modern Energy Management System\)](#)

[80220232 \(Principle and technology of new type of protection\)](#)

[80220252 \(Principles and Applications of Power Electronic Devices\)](#)

[80220261 \(Magnetophysics and Electromagnetic Evaluation\)](#)

[80220272 \(High-voltage Transmission Technology\)](#)

[80220281 \(Pulsed-power Applications and High-power Microwaves\)](#)

[80220302 \(Optimization Method in Modern Power Systems\)](#)

[80228033 \(Computer System and Its Applications\)](#)

3 Các địa chỉ tham khảo

3.1 Các trường của Mỹ

3.1.1 Trang thông tin chung

IEEE PES university program: <http://www.ieee-pes.org/professional-development/education/university-power-programs>

3.1.2 Điều tra về đào tạo power engineering 2013-2014

Các trường ĐH gửi thông tin về các nhánh đào tạo liên quan đến power engineering trong ngành Electrical Engineering, và các môn học.

[http://www.ieee-pes.org/images/files/pdf/peec-survey/2014 PEEC Survey University Program Descriptions.pdf](http://www.ieee-pes.org/images/files/pdf/peec-survey/2014%20PEEC%20Survey%20University%20Program%20Descriptions.pdf)

3.2 Các trường Châu Âu

3.2.1 University of Edinburg (post graduate):

<http://www.ed.ac.uk/studying/postgraduate/degrees/index.php?r=site/view&id=937>

3.2.2 Technical university of Munich (post graduate) – Đức:

<https://www.mspe.ei.tum.de/index.php?id=5&L=1>

3.2.3 RWTHAACHEN university (post graduate) – Đức:

<http://www.elektrotechnik.rwth-aachen.de/cms/Elektrotechnik-und-Informationstechnik/Studium/Master-Studiengaenge/Master-of-Science/Elektrotechnik-Informationstechnik/~imrr/Electrical-Power-Engineering-Master/?lidx=1>

3.2.4 Các trường Canada

http://www.canadian-universities.net/Universities/Programs/Power_Engineering.html

3.2.5 NTNU (NaUy):

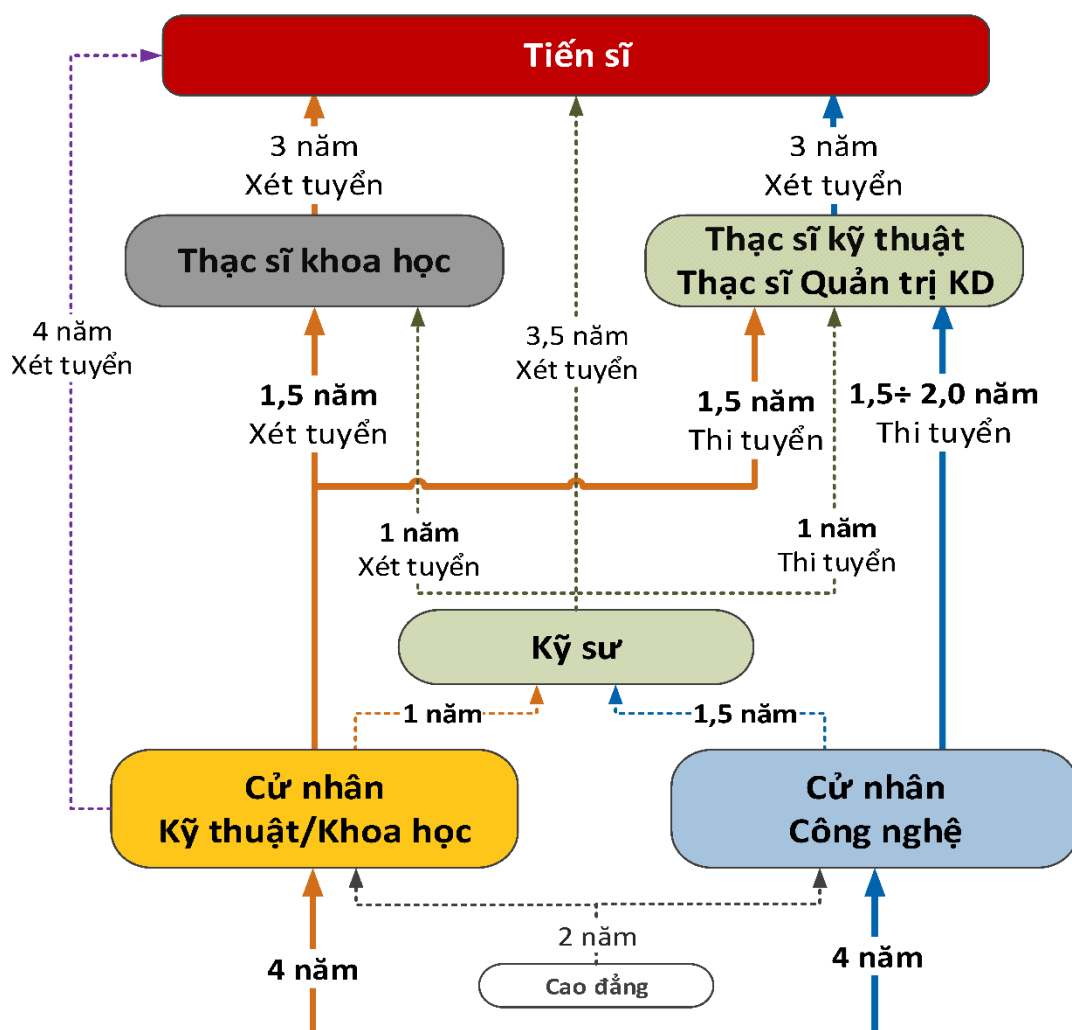
<https://www.ntnu.edu/studies/mselpower>

3.2.6 University of Queensland (Úc):

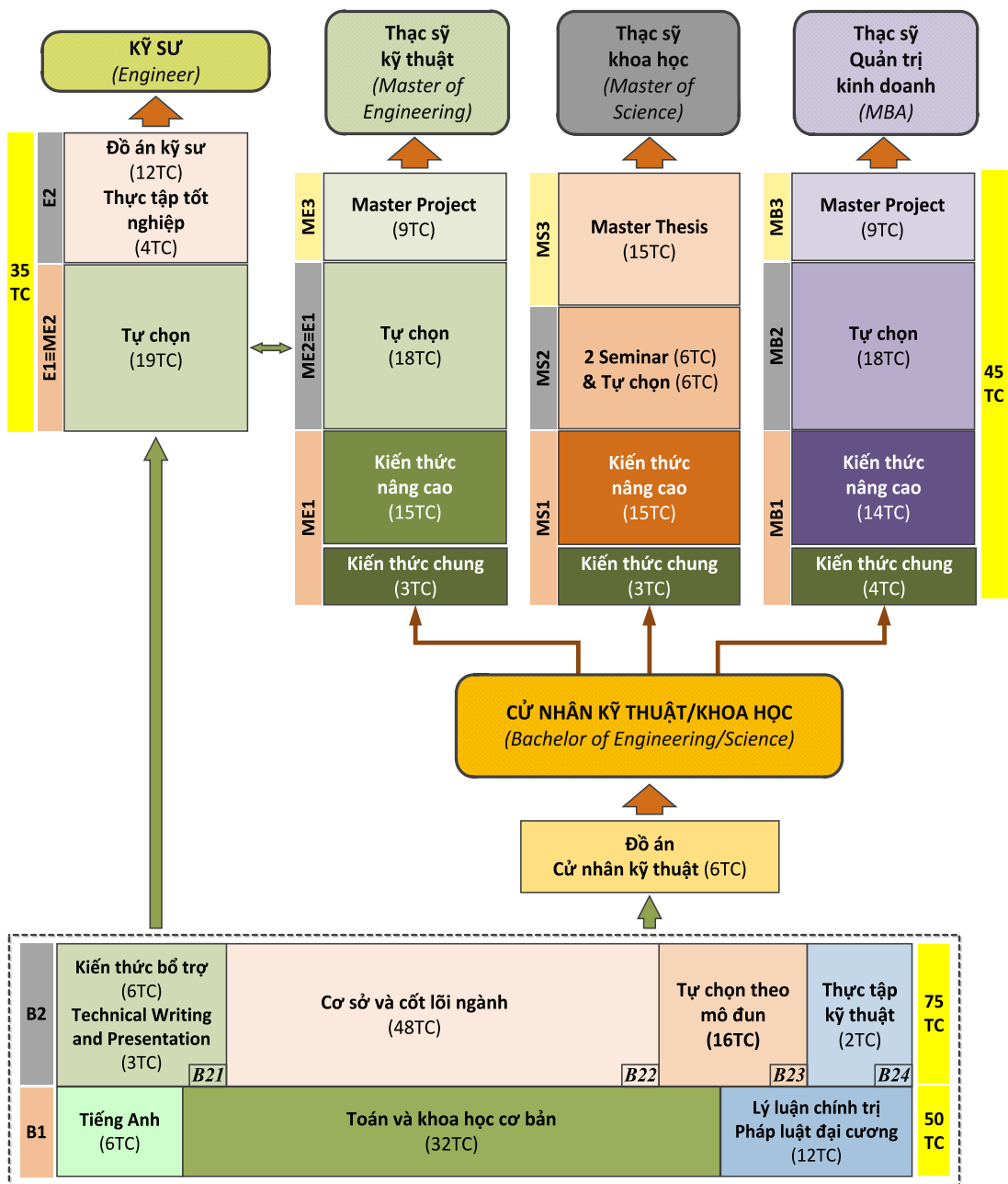
<https://www.usq.edu.au/study/degrees/engineering/power-engineering>

4 Cấu trúc chương trình đào tạo (HUST - CDIO)

4.1 Sơ đồ cấu trúc chương trình đào tạo



Hình 1 Cấu trúc CTĐT theo CDIO



Hình 2 Cấu trúc tín chỉ chương trình đào tạo theo CDIO.

4.2 Các khung chương trình tích hợp

Bảng 5 Khung chương trình tích hợp Cử nhân – Kỹ sư

CTĐT	TC	Ghi chú
Tích hợp CN – Kỹ sư	160	
Giáo dục đại cương	50	Hội đồng Xây dựng khối kiến thức đại cương
Toán và khoa học cơ bản	32	Định hướng thiết kế các học phần theo nhóm ngành đào tạo một cách phù hợp.
Lý luận chính trị Pháp luật đại cương	12	Theo quy định của Bộ GDĐT
GDTC/GD QP-AN	-	
Tiếng Anh	6	Gồm 2 học phần Tiếng Anh cơ bản
Giáo dục chuyên nghiệp	110	Hội đồng phát triển CTĐT
Cơ sở và cốt lõi ngành	48	Bao gồm từ 1÷3 đồ án thiết kế, chế tạo/triển khai. Có thể bố trí từ kỳ 4 đến kỳ 7, mỗi kỳ không quá 1 đồ án.
Kiến thức bổ trợ	9 (6+3)	Gồm hai phần kiến thức bắt buộc là Kiến thức bổ trợ về xã hội, khởi nghiệp và các kỹ năng khác (6TC) & Technical Writing and Presentation (3TC). - Nhà trường đưa danh mục gồm nhiều học phần bổ trợ. Hội đồng chọn khoảng 12TC từ danh mục này, SV phải chọn 6TC để học (tương đương 2÷3 học phần). - Tech. Writing and Presentation: là học phần bắt buộc, thiết kế học ở kỳ 7 hoặc 8.
Tự chọn theo môđun	16	Phần tự chọn theo môđun tạo điều kiện cho sinh viên học tiếp cận theo một lĩnh vực ứng dụng. - Môđun là nhóm học phần được thiết kế theo hướng <i>tiếp cận với một lĩnh vực ứng dụng của phần chương trình KS</i> do Hội đồng PTCTĐT ấn định. - Sinh viên tự chọn môđun và phải học tất cả học phần trong môđun đó. - Tổng số tín chỉ của các học phần trong các môđun đảm bảo tối thiểu 30 TC để sinh viên lựa chọn. Khối lượng kiến thức giữa phần “Cơ sở và cốt lõi ngành” và “Tự chọn theo môđun” có thể điều chỉnh trong khoảng ± 2 tín chỉ nhưng vẫn đảm bảo tổng số tín chỉ không đổi.
Thực tập kỹ thuật	2	Thực hiện từ trình độ năm thứ ba
Tự chọn KS	19 (13+6)	Tự chọn kỹ sư (19TC) bao gồm hai phần: - Khối kiến thức chuyên môn bắt buộc 13 TC được thiết kế theo môđun, mỗi môđun tương ứng với một lĩnh vực ứng dụng, trong đó có ít nhất một Đồ án thiết kế với thời lượng 3 tín chỉ, tập trung vào kỹ năng thiết kế. Sinh viên tự chọn và phải học tất cả học phần trong môđun. - Khối kiến thức tự chọn 6 TC để sinh viên tự chọn trong danh mục chung do Hội đồng PTCTĐT thiết kế.
Thực tập tốt nghiệp	4	Nên triển khai chủ yếu tại các cơ sở công nghiệp

Đồ án kỹ sư	12	Đề tài tốt nghiệp cần gắn liền với lĩnh vực ứng dụng và nên phù hợp với nội dung thực tập tốt nghiệp.
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Bảng 6 Khung chương trình tích hợp Cử nhân - Thạc sĩ khoa học

CTĐT	TC	Ghi chú
Tích hợp CN – ThS. KH	176	
Giáo dục đại cương	50	Hội đồng Xây dựng khối kiến thức đại cương
Toán và khoa học cơ bản	32	Định hướng thiết kế các học phần theo nhóm ngành đào tạo một cách phù hợp.
Lý luận chính trị Pháp luật đại cương	12	Theo quy định của Bộ GDĐT
GDTC/GD QP-AN	-	
Tiếng Anh	6	Gồm 2 học phần Tiếng Anh cơ bản
Giáo dục chuyên nghiệp	81	Hội đồng phát triển CTĐT
Cơ sở và cốt lõi ngành	48	Bao gồm từ 1÷3 đồ án thiết kế, chế tạo/triển khai. Có thể bố trí từ kỳ 4 đến kỳ 7, mỗi kỳ không quá 1 đồ án.
Kiến thức bổ trợ	9 (6+3)	Gồm hai phần kiến thức bắt buộc là Kiến thức bổ trợ về xã hội, khởi nghiệp và các kỹ năng khác (6TC) & Technical Writing and Presentation (3TC). - Nhà trường đưa danh mục gồm nhiều học phần bổ trợ. Hội đồng chọn khoảng 12TC từ danh mục này, SV phải chọn 6TC để học (tương đương 2÷3 học phần). - Tech. Writing and Presentation: là học phần bắt buộc, thiết kế học ở kỳ 7 hoặc 8.
Tự chọn theo môđun	16	Phần tự chọn (16 TC) được thiết kế theo các môđun trong lĩnh vực rộng của ngành đào tạo (ngành rộng). - Sinh viên tự chọn môđun và phải học tất cả học phần trong môđun đó. - Tổng số tín chỉ của các học phần trong các môđun đảm bảo tối thiểu 30 TC để sinh viên lựa chọn. Khối lượng kiến thức giữa phần “Cơ sở và cốt lõi ngành” và “Tự chọn theo môđun” có thể điều chỉnh trong khoảng ± 2 tín chỉ nhưng vẫn đảm bảo tổng số tín chỉ không đổi.
Thực tập kỹ thuật	2	Thực hiện từ trình độ năm thứ ba
Đồ án Cử nhân	6	
Sau đại học	45	Hội đồng phát triển CTĐT
Kiến thức chung	3	Môn Triết học
Kiến thức nâng cao	15	Là khối kiến thức nâng cao, chuyên sâu theo các chuyên ngành của ngành đào tạo.
Tự chọn	12	Các Hội đồng PTCTĐT thiết kế nội dung kiến thức theo hai hướng: - Hướng <i>Nghiên cứu hàn lâm</i> chú trọng lý thuyết chuyên sâu, trong đó 2 seminar (6TC) liên quan trực tiếp đến nội dung của luận văn thạc sĩ. Nội dung cụ thể của seminar do GVHD quyết định; đánh giá kết quả theo hình thức trình bày báo cáo khoa học trước đơn vị chuyên môn (Bộ môn).

		- Hướng <i>Nghiên cứu phát triển</i> chú trọng năng lực thiết kế của người học, trong đó thay thế 2 seminar bằng 2 đề án thiết kế (project), tổ chức theo nhóm học viên. Nội dung của đề án liên quan trực tiếp đến nội dung của luận văn thạc sỹ.
Luận văn thạc sỹ KH	15	

Bảng 7 Khung chương trình Cử nhân Ngôn ngữ Anh

CTĐT	TC	Ghi chú
CN Ngôn ngữ Anh	131	
Giáo dục đại cương	34	Hội đồng Xây dựng khối kiến thức đại cương
Kiến thức đại cương	12	
Lý luận chính trị Pháp luật đại cương	12	Theo quy định của Bộ GDĐT
GDTC/GD QP-AN	-	
Ngoại ngữ thứ 2	10	Ngôn ngữ khác tiếng Anh
Giáo dục chuyên nghiệp	97	Hội đồng phát triển CTĐT
Cơ sở và cốt lõi ngành	67	
Kiến thức bổ trợ	6	Nhà trường đưa danh mục gồm nhiều học phần bổ trợ về xã hội, khởi nghiệp và các kỹ năng khác (6TC). Hội đồng chọn khoảng 12TC từ danh mục này, SV phải chọn 6TC để học (tương đương 2÷3 học phần).
Tự chọn theo môđun	15	Phần tự chọn (16 TC) được thiết kế theo các môđun trong lĩnh vực rộng của ngành đào tạo (ngành rộng). - Sinh viên tự chọn môđun và phải học tất cả học phần trong môđun đó. - Tổng số tín chỉ của các học phần trong các môđun đảm bảo tối thiểu 30 TC để sinh viên lựa chọn. Khối lượng kiến thức giữa phần “Cơ sở và cốt lõi ngành” và “Tự chọn theo môđun” có thể điều chỉnh trong khoảng ± 2 tín chỉ nhưng vẫn đảm bảo tổng số tín chỉ không đổi.
Thực tập tốt nghiệp	3	
Khóa luận tốt nghiệp	6	

Bảng 8 Khung chương trình Cử nhân công nghệ

CTĐT	TC	Ghi chú
Cử nhân công nghệ	131	
Giáo dục đại cương	50	Hội đồng Xây dựng khối kiến thức đại cương
Toán và khoa học cơ bản	32	Định hướng thiết kế các học phần theo nhóm ngành đào tạo một cách phù hợp.
Lý luận chính trị Pháp luật đại cương	12	Theo quy định của Bộ GDĐT
GDTC/GD QP-AN	-	
Tiếng Anh	6	Gồm 2 học phần Tiếng Anh cơ bản
Giáo dục chuyên nghiệp	81	Hội đồng phát triển CTĐT
Cơ sở và cốt lõi ngành	42	Bao gồm từ 1÷3 đề án thiết kế công nghệ/chế tạo/triển khai, bố trí từ kỳ 4 đến kỳ 7, không quá 1 đề án/kỳ.
Kiến thức bổ trợ	9 (6+3)	Gồm hai phần kiến thức bắt buộc là Kiến thức bổ trợ về xã hội, khởi nghiệp và các kỹ năng khác (6TC) & Technical Writing and Presentation (3TC). - Nhà trường đưa danh mục gồm nhiều học phần bổ trợ. Hội đồng chọn khoảng 12TC từ danh mục này, SV phải chọn 6TC để học (tương đương 2÷3 học phần). - Tech. Writing and Presentation: là học phần bắt buộc, thiết kế học ở kỳ 7 hoặc 8.
Tự chọn theo môđun	12	Phần tự chọn (12 TC) được thiết kế theo các môđun trong lĩnh vực rộng của ngành đào tạo (ngành rộng). - Sinh viên tự chọn môđun và phải học tất cả học phần trong môđun đó. - Tổng số tín chỉ của các học phần trong các môđun đảm bảo tối thiểu 24 TC để sinh viên lựa chọn. Khối lượng kiến thức giữa phần “Cơ sở và cốt lõi ngành” và “Tự chọn theo môđun” có thể điều chỉnh trong khoảng ± 2 tín chỉ nhưng vẫn đảm bảo tổng số tín chỉ không đổi.
Thực tập công nghiệp	12	Thực hiện từ trình độ năm thứ ba tại cơ sở công nghiệp
Đề án Cử nhân công nghệ	6	