RENEWABLE ENERGY, B.TECH.

Major Code: 2398

The Renewable Energy Bachelor of Technology (RE B.Tech.) degree provides students with advanced technical education in the rapidly growing field of renewable energy. The RE B.Tech. program focuses on developing skilled graduates who are prepared to enter the job market as system designers, project managers, installation crew leaders, and operations and maintenance technicians for renewable energy systems including grid-tied solar photovoltaic, solar thermal, wind, heat pump, micro hydroelectric and bioenergy systems.

Students have a well-guided program that covers a wide range of important skills including installation and maintenance of energy systems, electrical and mechanical system design with contemporary software packages, and project management and permitting. Our installation classes focus strongly on real-world systems in state-of-the-art facilities. Graduates are prepared to climb career ladders quickly within a focus area of their choosing.

An internship is a recommended program option (3-15 credit hours) that places students in a supervised work environment with a cooperating employer. This provides students with opportunities to gain valuable experience, make professional contacts and build their resumes in preparation for future employment and career decisions. Many placement sites are available in New York State, but students who wish to travel can find opportunities in other parts of the country or abroad. Successful internships have included experiences in solar and wind energy, cellular communications, geothermal/HVAC, bioethanol production, and bioenergy systems.

Graduates from the RE B.Tech. have been successfully employed as system designers, installation and maintenance technicians, quality control supervisors, and project managers. Graduates are currently working within their chosen renewable energy field in several states across the country and abroad.

Required tools/equipment: Laptop, Klein Tool Kit (available through the bookstore), clipboard, safety glasses, work gloves, work boots (steel/safety toe), waterproof rubber boots (recommended), rain gear (coat and pants/bibs), and cold weather gear (insulated clothing).

Student Learning Outcomes

Upon successful completion of this program, students will be able to:

- Describe basic social, political, economic and ecological factors impacting renewable energy resources and systems regionally, nationally and abroad.
- Demonstrate problem-solving skills and critical thinking in both hands-on and written technical environments.
- Assess renewable energy resources for residential, commercial, and industrial renewable energy systems in wind, solar PV, solar thermal, heat pumps, geothermal, micro hydroelectricity and/or bioenergy for a wide range of sites and client objectives.
- Design mechanical and electrical components of renewable energy systems based on thorough resource assessment and client requirements.
- Install, maintain, and troubleshoot renewable energy systems. Perform an energy site assessment and develop a comprehensive energy system proposal for a prospective client and defend the proposal rationale in written and verbal discussion.
- Work safely and responsibility with live systems in diverse groups.

Curriculum Requirements

A minimum of 120 credits is required for degree completion.

Code	Title	Credits
Major Field Requirements		
RENG 101	Basic Elec Renewable Energy	4
RENG 102	Renewable Energy Resources	3
RENG 103	Renewable Energy Seminar	1
RENG 150	Analysis Techniques for Renewable Energy	1
RENG 221	Introduction to Wind Systems	3
RENG 231	Solar Photovoltaic Installation	3
RENG 310	Biomass Energy Resources	3
RENG 460	Systems Integration	3
RESC 125	Residential Electrification	3
NATR 113	Intro toGlobal Positioning Sys	1
NATR 213	Basics Geospatial Technology	1-2
or CAD 181	Intro To Computer-Aided Drftng	
CITA 101	Principles Computer Apps	3
Upper-Division Major Electives		
Select 24 credits of the following:		24
DTEC 325	Electrical Power Generation	
RENG 306	Alternative Fuel Vehicles	
RENG 311	Biofuels	
RENG 321	Intro to Micro Hyro Systems	
RENG 331	Solar Thermal Systems	
RENG 335	Solar Photovoltaic System Design	
RENG 340	Renewable Energy Heat & Cool	
RENG 350	Energy Economics & Financing	
RENG 355	Renewable Energy Law & Policy	
RENG 420	Wind Energy Development & Analytics	
RENG 435	Solar Development Engineering	
RENG 450	Advanced Grid Technologies	
RENG 480	Renewable Energy Internship Pr	
RENG 490	Renewable Energy Internship	
Required SUNY General Education & Liberal Arts and Sciences Coursework		
SUNY General Education Natural Sciences as advised		12
SUNY General Education Communication Written and Oral as advised		3-6
SUNY General Education Diversity, Equity, Inclusion and Social Justice as advised		3
MATH 123	Elementary Statistics	3
or MATH 141	Statistics	
Additional General Education as advised		6-9
Recommended Technical Electives		
Select 36-37 credits of the following:		36-37
Lower Division Technical Electives		
AGRO 110	Soil Science	
AGRO 210	Field Crops	
AUTO 102	Metals (welding)	

AGEN 161	Basic Hydraulics
BSAD 116	Business Organization & Mgmnt
CAD 181	Intro To Computer-Aided Drftng
CITA 120	Computer Concepts & Op Sys
CITA 140	Introduction to Programming
CITA 200	Data Communications Networking
DTEC 150	Diesel Systems
ENSC 101	Agricultural Science
ENSC 106	Pesticide Use and Handling
ENSC 107	Integrated Pest Management
MECH 101	Machine Tools
MECH 211	Analytical Mechanics (Statics)
NATR 103	Natural Resources Equipment Op
NATR 213	Basics Geospatial Technology
RENG 225	Tower Climbing and Rescue
RENG 240	Introduction to Heat Pumps
RESC 130	Light Framing
RESC 221	Plumbing
RESC 260	Heating And Energy Systems
Upper Division Technical Electives	
AGRO 310	Pasture Mgt and Forages Prod
BSAD 300	Management Communications
BSAD 310	Human Resource Management
BSAD 320	Entrepreneurship
BSAD 400	Production & Operation Mgt
CITA 405	Project Management
ENRM 303	Fundamentals Geospatial System
ENRM 305	Environment Law Policy Justice
ENRM 332	Environment Planning & NR Mgt
STS 301	Humans vs. Nature
Total Credits	**116-124**

Suggested Course Sequence

Course	Title	Credits
Year 1		
Fall		
RENG 101	Basic Elec Renewable Energy	4
RENG 102	Renewable Energy Resources	3
RENG 103	Renewable Energy Seminar	1
MATH 123	Elementary Statistics (or as advised)	3
SUNY General Education Communication Written and Oral as advised (ex. COMP 101)		3
NATR 113	Intro toGlobal Positioning Sys	1
	Credits	**15**
Spring		
RENG 150	Analysis Techniques for Renewable Energy	1
NATR 213	Basics Geospatial Technology	2
RESC 125	Residential Electrification	3
SUNY General Education Natural Sciences as advised (ex. BIOL 101)		4
CITA 101	Principles Computer Apps	3
SUNY General Education Communication Written and Oral as advised (ex. COMM 111)		3
	Credits	**16**
Year 2		
Fall		
RENG 231	Solar Photovoltaic Installation	3
RENG 310	Biomass Energy Resources	3
SUNY General Education Natural Sciences as advised (ex. PHYS 107)		4
SUNY General Education Diversity, Equity, Inclusion and Social Justice as advised (ex. ENSC 261)		3
100-200 Lower Division Elective as advised (ex. NATR 103)		2
	Credits	**15**
Spring		
CAD 181	Intro To Computer-Aided Drftng	1
RENG 221	Introduction to Wind Systems	3
SUNY General Education Natural Sciences as advised (ex. CHEM 101)		4
SUNY General Education as advised (ex. World History & Global Awareness)		3
100-200 Lower Division Elective as advised (ex. RENG 240)		3
100-200 Lower Division Elective as advised (ex. RESC 260)		3
	Credits	**17**
Year 3		
Fall		
RENG 311	Biofuels	3
RENG 335	Solar Photovoltaic System Design	3
RENG 355	Renewable Energy Law & Policy	3
DTEC 325	Electrical Power Generation	3
SUNY General Education as advised (ex. Humanities)		3
	Credits	**15**
Spring		
RENG 331	Solar Thermal Systems	3
RENG 340	Renewable Energy Heat & Cool	3
RENG 350	Energy Economics & Financing	3
RENG 420	Wind Energy Development & Analytics	3
RENG 435	Solar Development Engineering	3
	Credits	**15**
Year 4		
Fall		
RENG 450	Advanced Grid Technologies	3
RENG 460	Systems Integration	3
RENG 480	Renewable Energy Internship Pr	1
SUNY General Education as advised (ex. The Arts or World Languages)		3
300-400 Upper Division Elective as advised (ex. CITA 405)		3
100-200 Lower Division or 300-400 Upper Division Elective as advised (ex. RENG 225)		3
	Credits	**16**
Spring		
Select one of the following options:		12
Option 1:		
RENG 490	Renewable Energy Internship	
Option 2:		
Elective as advised (ENRM 303)		
300-400 Upper Division Elective as advised (ex. ENRM 332)		
Elective as advised (ex. AUTO 102)		
Elective as advised (ex. BSAD 400)		
	Credits	**12**
	Total Credits	**121**