

# RENEWABLE ENERGY SPECIALIST



**Program Code 10-482-3**

**Expected Program Costs: \$11,500**

**Median Annual Salary: \$35,000**

## OVERVIEW

The Renewable Energy Specialist program will prepare students to design an integrated portfolio of renewable and traditional energy producing systems. Students perform site assessments and recommend appropriate renewable energy technologies, sell and/or market renewable energy technologies and manage renewable energy installation projects. Renewable Energy Specialists will have a working knowledge of “green” building concepts and energy efficient design principles.

The Renewable Energy Specialist program is offered at the Wisconsin Rapids campus.

## PROGRAM OUTCOMES

Employers will expect you, as a Renewable Energy Specialist graduate, to be able to:

- Perform site assessments for solar photovoltaic, solar thermal and small wind systems
- Conduct feasibility studies regarding installation of renewable energy systems
- Design an integrated portfolio of renewable energy systems
- Respond to customer inquiries
- Manage renewable energy system installation projects
- Sell renewable energy systems

## CAREER OPPORTUNITIES

Customer Service Representative  
Engineer/Design Technician  
Installation Assistant  
Project Manager  
Renewable Energy Specialist  
Sales Representative  
Site Assessor  
Solar Applications Technician

## POTENTIAL FOR ADVANCEMENT

Architectural Designer  
HVAC Designer  
Mechanical Leader  
Project Engineer

*Potential advancement generally requires further education or training.*

## ADMISSIONS PROCEDURES

To apply to the Renewable Energy Specialist program, please submit the following documents to the MSTC Admissions Office:

1. Complete an MSTC application form and return it with the \$30 non-refundable application fee.
2. Complete the Accuplacer or ACT test. Minimum scores required:
  - Reading-Accuplacer score of 55
  - Sentence Skills-Accuplacer score of 60
  - Math-Accuplacer score of 34
  - ACT equivalents for above scores are acceptable.

If a student does not meet the required test scores, they may retest or complete an identified structured course(s) in the Academic Support Center.

- Written Communication, courses in mathematics and some science courses have placement requirements. Please refer to the course description section in the back of the catalog, listed under General Education, for course specific information.
3. Submit an official copy of all academic transcripts, including high school, college or university and HSED/GED.

## PROGRAM COURSE DESCRIPTION

### **10001148 // 3 credits**

#### **People, Resources and the Sustainability**

This course explores the relationship between the human population and natural resources over time, and the effect this relationship has on the biosphere. Global resources, environmental concerns, and the human dimensions of resource management are explored from biological and socioeconomic perspectives.

### **10103124 // 1 credit**

#### **Excel-Intermediate**

Develop skill to write and debug macros, create custom menus, perform database functions and develop graphs.

*Prerequisite: Microsoft Office-Introduction 10103106 or Excel-Beginning 10103123*

**Mid-State Technical College**

**Admissions**

**500 32nd Street North**

**Wisconsin Rapids, WI 54494**

**10103106 // 3 credits**

**Microsoft Office-Introduction**

Develops introductory skills in the Microsoft Office Suite (Word, Excel, Access, PowerPoint, and Outlook) while reinforcing the students' knowledge of computer concepts, Windows Explorer and Internet usage through demonstrations and lab exercises. Students should possess basic keyboarding, mouse and Windows XP skills. Students may develop these skills in Academic Support Center computer training prior to enrolling or while concurrently enrolled in the Microsoft Office-Introduction course.

**10480100 // 2 credits**

**Alternative Energy Overview**

In this course, students will investigate the need for renewable energy systems and emerging careers in renewable energy. Students will examine the basic design, function, cost, and other considerations associated with various "green" energy systems, including solar photovoltaic, solar thermal, wind, geothermal and biomass. Students will also explore the production and use of alternative transportation fuels.

**10480190 // 2 credits**

**Renewable Energy Internship**

Student internships provide an opportunity for career success through supervised on-the-job learning experiences. Through an internship, students will apply subject knowledge learned in the program to the workplace under the direction of an experienced technician. *Prerequisite: Completion of 50% of program credits*

**10480195 // 2 credits**

**Renewable Energy/Energy Conservation-Special Topics**

Selected hands-on project in renewable energy/energy conservation requiring students to apply subject knowledge learned in the program. *Prerequisite: Completion of 50% of program credits*

**10481100 // 2 credits**

**Intro to Energy Efficiency & Management**

Students in this course will be introduced to the principles of energy management and the energy efficiency industry. Students will learn about the history of energy production and costs, the dynamics of worldwide energy consumption and growth including environmental and financial impacts and consequences. Building energy flows will be described and analyzed. Students will be introduced to the use of building diagnostic tools commonly employed in the industry to identify opportunities for improving energy efficiency. Building design features will be examined for efficiency/management improvements or upgrades.

*Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program*

**10481109 // 2 credits**

**Building Envelope Analysis I**

Students will learn the tools and techniques used in the analysis of building shell integrity, with the first module to focus on blower door testing to quantify building envelope air leakage and infiltration rates. These concepts and skills will be taught through extensive lab-hours working directly with the tools of the trade.

*Corequisites: Intro to Energy Efficiency & Management 10481100; Construction Fundamentals 10482107; and College Mathematics 10804107*

**10482100 // 2 credits**

**Intro to Renewable Electricity**

Students in this course will learn the basics of renewable electricity generation with particular emphasis on wind and solar energy. Topics will include wind and solar resources, basic system components, system types and applications.

*Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program*

**CURRICULUM**

**Term (17-18 credits)**

10103106	Microsoft Office-Introduction	3
10480100	Alternative Energy Overview	2
10482100	Intro to Renewable Electricity	2
10483100	Intro to Renewable Thermal Systems	3
10483120	Heating & Plumbing Systems	2
106050105	Electrical Circuits I	3
<b>-or-</b>		
10605108	Intro to Electronics	2
10804107	College Mathematics	3

**Term (17 credits)**

10103124	Excel-Intermediate	1
10482101	Solar PV Site Assessor Training	2
10482107	Construction Fundamentals	2
10483101	Solar Water Heating Site Assessor Training	2
10483122	Ventilation & Cooling Systems	2
10623106	Intro to AutoCAD	2
10801195	Written Communication	3
10809143	Microeconomics	-or-
10809144	Macroeconomics	3

**Term (2 credits)**

10480190	Renewable Energy Internship	-or-
10480195	Renewable Energy/Energy Conservation-Special Topics	2

**Term (16 credits)**

10481100	Intro to Energy Efficiency & Management	2
10481109	Building Envelope Analysis I	2
10482102	Wind Site Assessor Training	2
10482120	Wind Systems Installation I	2
10482140	RE-Planning, Design & Project Management I	2
10801196	Oral/Interpersonal Communication	-or-
10801198	Speech	3
10809172	Race, Ethnic & Diversity Studies	-or-
10809196	Intro to Sociology	3

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# RENEWABLE ENERGY SPECIALIST

## CURRICULUM

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Term		(16 credits)
10001148	People, Resources and the Sustainability	3
10482110	Photovoltaic System Installation I	2
10482141	RE-Planning, Design & Project Management II	2
10483110	Solar Water Heating System Installation I	2
10809122	Intro to American Government	3
10809198	Intro to Psychology Elective	3

**Total Credits 68-69**

**Please Note:**

- The Renewable Energy Specialist program has an August start date. We advise you to meet with an academic advisor or counselor to successfully plan your academic schedule.
- This curriculum sequence is only for student planning. Actual student schedules will vary depending on course availability.
- Degree completion time may vary based on student scheduling and course availability.
- For General Education course descriptions (800 level), see section marked under Course Descriptions.

**10482101 // 2 credits**

**Solar PV Site Assessor Training**

Students will learn the steps to perform solar PV site assessments of a home or business. Class content will cover: solar window determination, load analysis, site selection, system types, system sizing and efficiency measures, energy output estimation. The course will also cover an overview of existing renewable electric incentive programs and permitting procedures.

*Corequisite: Intro to Renewable Electricity 10482100 Program*

**10482102 // 2 credits**

**Wind Site Assessor Training**

Students will learn the steps to perform wind site assessments of a home or business. Class content will cover: measuring wind energy potential, load analysis, site selection, system types, system sizing and efficiency measures, energy output estimation. The course will also cover an overview of existing renewable electric incentive programs and permitting procedures.

*Prerequisite: Intro to Renewable Electricity 10482100*

**10482107 // 2 credits**

**Construction Fundamentals**

Students will study the concepts associated with the theory, materials, and methods used in construction to include footings and foundations, walls, floors, roofs and roof materials, exterior finishes, interior walls, ceiling and floor finishes, insulation types, vapor and air infiltration, and sound protection. Additionally, students will become familiar with blueprint reading and examine all the trades associated with construction including, electrical, HVAC, and plumbing. The safe use of the appropriate tools for each trade will also be covered.

*Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program*

**10482110 // 2 credits**

**Photovoltaic System Installation I**

Students will learn the details involved in the mechanical integration of a PV system. Topics include: system components, product specifications, product integration, racking system design capabilities and limits, system diagramming, configurations, safety, common design mistakes and solutions, installation techniques. This course will involve students in the installation of a photovoltaic system.

*Prerequisite: Intro to Renewable Electricity 10482100*

**10482120 // 2 credits**

**Wind Systems Installation I**

This course will involve students in the installation of a tilt up tower. Topics include safety, system design, layout, and turbine performance.

*Corequisite: Wind Site Assessor 10482102*

**10482140 // 2 credits**

**E-Planning, Design & Project Management I**

Students in this capstone course will design an integrated portfolio of energy systems, incorporating renewable energy options into a conventional system. Each learner will write a project proposal, work with project teams, sequence project tasks, develop project budgets, and identify project resources.

*Prerequisites: Intro to Renewable Thermal Systems 10483100; Intro to Renewable Electricity 10482100; Intro to Energy Efficiency & Management 10481100*

**10482141 // 2 credits**

**RE-Planning, Design & Project Management II**

This class is a continuation of Renewable Energy-Planning, Design & Project Management I. Students will create a capstone project that incorporates traditional and renewable energy systems with an overall goal of peak energy efficiency.

*Prerequisite: Renewable Energy - Planning, Design & Project Management I 10482140*

**10483100 // 3 credits**

**Intro to Renewable Thermal Systems**

This course provides an overview of a variety of renewable/alternative water and space heating systems including, solar, geothermal and biomass. This overview will include an introduction to system design, installation and operation.

*Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program*

**10483101 // 2 credits**

**Solar Water Heating Site Assessor Training**

Students will learn how to assess a facility for its potential for a solar hot water system. Students will learn how to define a site's solar window, interpret solar radiation and temperature data, size a system, identify mounting and engineering considerations relevant to the installation; identify & recommend steps for energy efficiency; perform a load analysis; describe & identify components of a solar water heating system; perform a general cost estimate for a solar water heating installation; list installers and equipment vendors; provide information on financial programs in Wisconsin.

*Corequisite: Intro to Renewable Thermal Systems 10483100*

**10483110 // 2 credits**

**Solar Water Heating System Installation I**

This course will involve students in the installation of a solar hot water system. Topics include safety, system design and layout, component selection, mounting collectors, plumbing and insulating copper pipe, and installing a storage tank, heat exchanger, circulation pump, and other system components.

*Prerequisite: Intro to Renewable Thermal Systems 10483100*

**10483120 // 2 credits**

**Heating & Plumbing Systems**

Heating system topics include introduction to heat principles, temperature measurement, fuels and other sources of heat, combustion, basic heating systems, basic furnace design, gas furnace design and operation, venting of furnaces, chimney or exhaust gases, and system controls. Plumbing system topics include fluid dynamics (pressure, resistance, and flow), basic system design, water heating, and operation of standard plumbing fixtures.

*Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program*

**10483122 // 2 credits**

**Ventilation & Cooling Systems**

Topics covered include air conditioning principles and terms, physical principles of air movement, air filtering and humidity, methods of conditioning air for comfort and health. In addition, the proper use of psychrometers, dry bulb thermometers, hygrometers, and the reading and interpretation of psychrometric charts and scales are covered, along with ASHRAE and BPI ventilation standards for residential units. Descriptions of new products, and maintenance and operations for residential and commercial cooling systems are also covered, emphasizing energy conservation and efficiency options for new and existing equipment.

**10605108 // 2 credits**

**Intro to Electronics**

This course presents a survey of electricity and electronics which includes lab activities and is designed for persons wishing to learn some of the basics of electricity and electronics. It is an excellent refresher course to get back into electronics or improve a skills list. The course is intended for persons where electronics has become a part of their regular occupation and a need exists to identify various electronic components and perform basic tests using test equipment such as multimeters and oscilloscopes. The course covers concepts and applications of DC and AC electricity, semiconductor components, and digital devices using basic math skills.

**10623106 // 2 credits**

**Intro to AutoCAD**

This is an introductory course in computer aided drafting (CAD) using AutoCAD software. It will provide foundation skills in using CAD software to create and print two dimensional technical drawings. This course is available to students in any program. Computer skills and prior knowledge of drawing/drafting techniques is recommended.