

**RC 320**  
**Small Wind Energy Systems**

**3 Credits**

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## RC 320 Version: 3



### Small Wind Energy Systems

#### Calendar Description

This is an advanced course that examines the steps involved in establishing a wind energy installation. Topics of discussion include assessment of the installation site, wind assessment, electrical components and considerations of a wind energy system, selecting a turbine and system as well as coverage of regulations, paperwork and safety.

#### Rationale

This is a required course for the Sustainable Energy Technology diploma program. There are several benefits to increasing the world's use of renewable energy. One of the benefits is the reduced greenhouse gas emissions from renewable energy sources relative to fossil fuel energy sources. There is a general consensus among scientists that emissions of greenhouse gases from fossil fuels are a major contributor to climate change on Earth. If renewable energy sources can be used to replace existing or fossil fuel energy use, then the global impacts of climate change could be reduced.

Wind is a key component of renewable energy power generation. Wind power is becoming an increasingly significant energy producer in both large and smaller scale projects and is increasing in new online operations each year.

This course provides the background of key factors and concepts required to understand steps involved as well as important considerations when establishing a wind turbine system installation. This course enhances the opportunity for course participants to participate in the wind energy business.

#### Prerequisites

RC 204

#### Co-Requisites

None

## Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. list the steps and processes involved in an initial site assessment for a wind turbine installation.
2. define concepts involved with choosing an appropriate wind turbine system for an installation.
3. compute various wind factors from collected wind data.
4. select an appropriate wind turbine system for an installation.
5. evaluate an appropriate wind turbine system for an installation
6. explain components of a wind turbine electrical system.
7. list the regulations required in Alberta and two other selected locations for a wind turbine installation.
8. explain and summarize the paperwork required in Alberta and two other selected locations for a wind turbine installation.
9. identify various safety considerations, avoiding unsafe situations when performing wind turbine installations.

## Resource Materials

### *Required Text(s):*

This textbook is mailed out to registered students:

Gipe, P. 2004. Wind power renewable energy for home, farm, and business. Chelsea Green, White River Junction, VT.

This course uses Excel and Word so students must have Excel 2007 or a later version and Word 2007 or a later version installed on their computer to do this course.

## Conduct of Course

This course consists of the equivalent of 45 hours of lecture delivered through the Internet using an on-line learning manager program. Course content modules and links to some assigned readings are available on-line. A course facilitator is available to guide the student through the course, answer any questions, and grade assignments. Students are expected to participate in on-line discussion forums with other classmates and the course facilitator. Assignments include on-line discussions, assessments (on-line quizzes) and assignment papers. Assignments are submitted through the learning manager program. Exams are taken on-line. In order to complete the course on time, deadlines for assignments and exams are enforced.

## Evaluation Procedures

Grades are assigned with the following weightings:

<u>Evaluation Tool</u>	<u>Weighting</u>
Assignments/Discussions 5 lessons	50%
Final Project	50%
Total	100%

## Grade Equivalents and Course Pass Requirements

*A minimum grade of D (50%) (1.00) is required to pass this course.*

Letter	F	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Percent Range	0-49	50-52	53-56	57-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00	4.00

**Students must maintain a cumulative grade of C (GPA - Grade Point Average of 2.00) in order to qualify to graduate.**

## Attendance

Active participation is required in all courses within the Sustainable Energy Technology certificate and diploma programs. Each facilitator designates these requirements through the use of tools within the management system and personal contact with learners.

These expectations can be given marks as part of the assessment process. Each course outlines these expectations within the course structure.

For example, learners can be asked to demonstrate their participation/attendance through discussion forums, sharing research results, contributing relevant information, submitting assignments, communicating with colleagues and the facilitator, and participating in synchronous meetings or asynchronous activities.

Attendance is considered vital to the learning process. Absenteeism is recorded. For example, if a discussion forum is organized; the learner is expected to attend as per the guidelines set by the facilitator.

Students can request for an excused absence. An excused absence is one that is verified with your facilitator.

NOTE: Any exceptions to the above attendance policy (e.g. family or work-related issues) **must** be approved in writing by the Department Chair **prior** to the beginning of the course.

It is the student's responsibility to know their own absentee record.

## **Course Units/Topics**

### **0. Media Library and Syllabus**

#### **1. Site Assessment**

##### 1.1 Site Assessment

#### **2. Wind Assessment**

##### 2.1 Wind Assessment

### **3. Selecting a Turbine and System**

##### 3.1 Selecting a Turbine and System

### **4. Electrical Components and Considerations**

##### 4.1 Electrical Components and Considerations

### **5. Regulations, Paperwork and Safety**

##### 5.1 Regulations and Paperwork

##### 5.2 Safety



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