

# Wind Power Fundamentals

**RENG 102 – 5 Credits – January 2011**

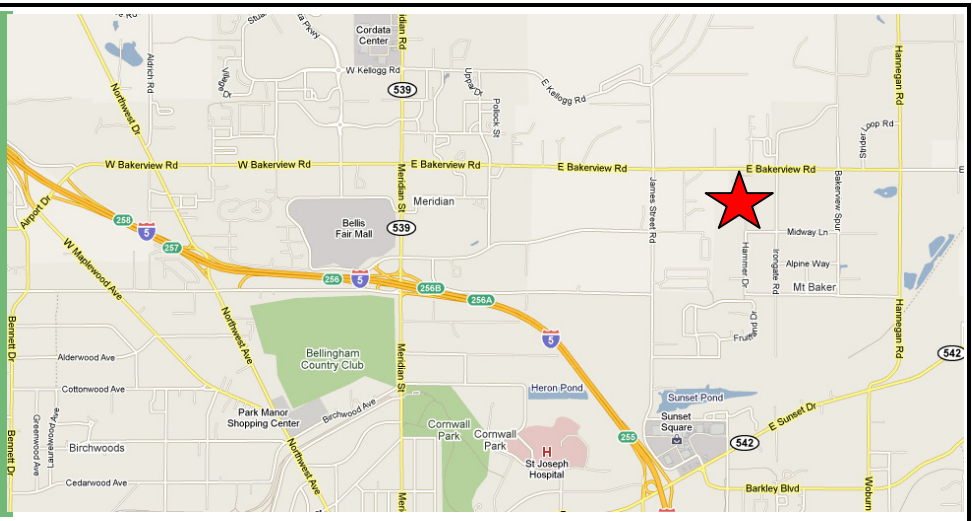


## Class Description:

This class provides the fundamentals of Wind Power production. The course materials include an overview of wind physics. In addition, the course covers traditional system components including vertical and horizontal axis turbines, generators, and governors.

## Location:

**Building Industry Association of  
Whatcom County  
1650 Baker Creek Place  
Bellingham, WA 98226**



## Dates and Times:

The class is scheduled to run on **Tuesday and Thursday evenings at 6:00-9:00 PM from January 4<sup>th</sup> to January 27<sup>th</sup>**. This provides a total of (8) evening classes to cover the course material. Please see the Class Calendar on the last page.

## Tuition and Registration:

Tuition must be paid before the class begins. Program enrolled students have seniority for this class and should register online three-weeks before the class begins. Continuing education students may begin registering online two-weeks before the class begins. Students may also send class registrations by mail to the following address:

**Washington Engineering Institute  
Registration Office  
PO Box 483  
Custer WA 98240**

Washington Engineering Institute, PO Box 483, Custer WA 98240

website: [www.weiedu.org](http://www.weiedu.org)

email: [admin@weiedu.org](mailto:admin@weiedu.org)

phone: (360) 739-1428

## School Provided Materials:

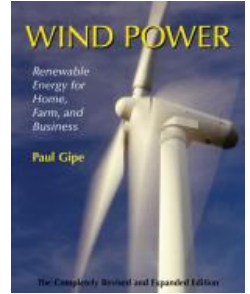
---

- **Lecture Notes:** The school provides lecture handouts as needed.

## Student Provided Materials:

---

- **Wind Power 2<sup>nd</sup> Edition ISBN: 9781931498142.** by Paul Gipe, Published by Chelsea Green. You can order this excellent textbook directly from Chelsea Green at [www.chelseagreen.com](http://www.chelseagreen.com).
- 3 Ring Binder, calculator, engineer calculations pad (green sheets), and small straight edge for linework.
- Laptop computer with wireless capability
- Positive, motivated, respectful, and helpful classroom character



## Instructor

---

### Terrance Meyer, PE

Convivium Renewable Energy ([www.conviviumre.com](http://www.conviviumre.com))

Cascade Community Wind Company ([www.cascadecommunitywind.com](http://www.cascadecommunitywind.com))

**Experience:** 10 years of experience in wind resource assessment and modeling. Having performed more than 50 such assessments over the last few years. Mr. Meyer has worked with tribes, industry, island communities, as well as utility projects. Mr. Meyer has a broad knowledge of renewable energy resources including wind, hydro, solar, geothermal, biomass, and biofuels, making him well suited to identify the resources available at a given site or geographic area based on its unique attributes.

**Registration:** Professional Engineer  
State of Washington and Kansas

**Education:** Bachelor of Science in Mechanical Engineering  
Berkeley, California

## Format:

---

**Class Structure:** Evenings will typically run in one-hour blocks as follows:

6:00 PM – Class setup and first hour  
6:50 PM – Break  
7:00 PM – Class  
7:50 PM – Break  
8:00 PM – Class last hour

## Final Exam and Grades:

---

Grades will be determined by attendance (20%), research project (20%), and homework assignments (60%). The Instructor holds the sole authority to issue grades and shall issue grades based on a 4.0 schedule as follows.

### Grading legend

4.0	A+
3.7	A
3.5	A-
3.3	B+
3.0	B
2.7	B-

2.4	C+
2.0	C
1.7	C-
1.4	D+
1.0	D
0.7	D-

AU	Class audited with no grade earned
EXP	Experiential credit granted per policy
EDU	Prior education credit granted per policy
I	Incomplete – Instructor Allows Extra Time to Complete
W	Withdrawn from class

Washington Engineering Institute, PO Box 483, Custer WA 98240

website: [www.weiedu.org](http://www.weiedu.org)

email: [admin@weiedu.org](mailto:admin@weiedu.org)

phone: (360) 739-1428

# January 2011 – Wind Power Fundamentals – RENG 102

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
					1	2
3	<b>4 Physics</b> 6:00-9:00 PM Read Ch 1-2 before first class Introductions Syllabus / Grading Moment Arms and Torque Read Ch 3 for next class	5	<b>6 Wind Measurement</b> 6:00-9:00 PM Wind speed, power, height Wind Data in US Height estimation Read Ch 4-5 for next class	7	<b>8 Optional Lab</b> 8:00-11:00 AM	9
10	<b>11 Estimating Output</b> 6:00-9:00 PM Swept Area Method Rules of Thumb Efficiency and Losses Read Ch 13 for next class	12	<b>13 Siting</b> 6:00-9:00 PM ***Meet at the Northwest Annex Conference Room, 5280 Northwest Drive, Bellingham*** Physical and Agency Restrictions Property Values Noise and Shadow Flicker Read Ch 6-7 for next class	14	<b>15 Optional Lab</b> 8:00-11:00 AM	16
17	<b>18 Economics and Purchasing</b> 6:00-9:00 PM Payback / ROI Residential Economics Commercial Economics Power Ratings Contracts and Warranties Read Ch 9-10 for next class	19	<b>20 On and Off Grid</b> 6:00-9:00 PM Federal Feed Laws Local Utilities / PSE Residential hybrid power Consumption vs. Production Read Ch 15-16 for next class	21	<b>22 Optional Lab</b> 8:00-11:00 AM Possible Field Trip Highland Energy Systems	23
24	<b>25 Installation</b> 6:00-9:00 PM Foundation and Anchors Guyed, Freestanding, and Tilt-up Towers Wiring, J-boxes, and ground nets Read Ch 17 for next class	26	<b>27 Operation and Maintenance</b> 6:00-9:00 PM Research Reports Discussion Monitoring Maintenance Life Expectancy	28	<b>29 Optional Lab</b> 8:00-11:00 AM Possible Field Trip Ellensburg / Kittitas County	30

Washington Engineering Institute, PO Box 483, Custer WA 98240

website: [www.weiedu.org](http://www.weiedu.org)

email: [admin@weiedu.org](mailto:admin@weiedu.org)

phone: (360) 739-1428



PO Box 483  
 Custer WA 98240  
[admin@weiedu.org](mailto:admin@weiedu.org)  
 (360) 739-1428

## Class Registration Form 2010 v2.0

**Returning students with a Student ID do not need to fill out the gray portions of this form.**

<b>Name</b>	
<b>Address</b>	
<b>Phone</b>	
<b>Email</b>	

<b>Class Requested</b>	<b>RENG 102 – Wind Power Fundamentals</b>
<b>Class Month / Date</b>	<b>January 2011</b>

**WAC 490-105-160 – State Licensed School Reporting Requirements:**

<b>Student ID #</b>		
<b>SSN #</b>		
<b>Date of Birth</b>		
<b>Gender</b>		
<b>Disability</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Race</b>	<input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black/African American <input type="checkbox"/> Hawaiian Native or Pacific Islander <input type="checkbox"/> Hispanic <input type="checkbox"/> White/Caucasian <input type="checkbox"/> Multi-racial <input type="checkbox"/> Other	
<b>Prior Education</b>	<input type="checkbox"/> Less than high school graduation <input type="checkbox"/> GED <input type="checkbox"/> High School Graduate <input type="checkbox"/> Post H.S., no degree or certificate <input type="checkbox"/> Associate Degree <input type="checkbox"/> Bachelor Degree <input type="checkbox"/> Master or Doctorate Degree	GED Year _____ Graduation Year _____  Graduation Year _____ Graduation Year _____ Graduation Year _____
<b>Name of Last School Attended</b>		

\_\_\_\_\_  
**Student Signature**

\_\_\_\_\_  
**Date**