**Clackamas Community College**
**Engineering Transfer**
**to**
**Oregon Institute of Technology**
**Bachelor of Science in Renewable Energy Engineering**

**Articulation Agreement**
**2016 - 2017 Catalog**

It is agreed that students transferring from Clackamas Community College (Clackamas) to Oregon Institute of Technology's (Oregon Tech) Bachelor of Science in Renewable Energy Engineering (BSREE) will be given full credit for all selected courses listed below. This agreement is based on the evaluation of the rigor and content of the general education and technical courses at both Clackamas and Oregon Tech and is subject to a yearly reevaluation by both schools for continuance. This agreement is dated July 21, 2016.

Baccalaureate students must complete a minimum of 60 credits of upper-division work before a degree will be awarded. Upper-division is defined as 300-and 400-level classes at a bachelor's degree granting institution. Baccalaureate students at Oregon Tech must complete 45 credits from Oregon Tech before a degree will be awarded.

Students are responsible for notifying the Oregon Tech Admissions and Registrar's Office when operating under an articulation agreement to ensure their credits transfer as outlined in this agreement. Dual enrollment is possible according to an existing Memorandum of Understanding. In order to utilize this agreement students must be attending Clackamas during the above catalog year. Students must enroll at Oregon Tech within three years of this approval.

By _____
David Plotkin
Vice President, Instruction & Student Service
Clackamas Community College

By _____
Bill Waters, Dean
Curriculum, Planning and Research
Clackamas Community College

By _____
Marla R. Edge
Director, Academic Agreements
Oregon Institute of Technology

By _____
Wendy Ivie
University Registrar
Oregon Institute of Technology

By _____
Claudia Torres Garibay, Chair
Electrical Engineering and
Renewable Energy Department
Oregon Institute of Technology

## Clackamas Courses & Oregon Tech Equivalent Credits

| Clackamas Community College Course Number & Title | Qtr. Units | Oregon Institute of Technology Course Number & Title | Qtr. Units |
|---|---|---|---|
| Arts & Letters elective [1] | 9 | Humanities elective [1] | 9 |
| CH-221 General Chemistry | 5 | CHE 201 General Chemistry<br>CHE 204 General Chemistry Lab | 3<br>1 |
| CH-222 General Chemistry | 5 | CHE 202 General Chemistry<br>CHE 205 General Chemistry Lab | 3<br>1 |
| ECON-201 Principles of Economics: MICRO<br>**or**<br>ECON-202 Principles of Economics: Intro to MACRO | 4 | ECO 201 Principles of Economics, Microeconomics<br>**or**<br>ECO 202 Principles of Economics, Macroeconomics | 3 |
| ENGR-111 Introduction to Engineering<br>ENGR-112 Engineering Programming<br>or<br>RET-200 Renewable Energy Systems | 3<br>3<br>or<br>4 | ENGR 101 Introduction to Engineering I<br>ENGR 102 Introduction to Engineering II<br>or<br>REE 201 Introduction to Renewable Energy | 2<br>2<br>or<br>3 |
| ENGR-211 Statics | 4 | ENGR 211 Engineering Mechanics: Statics | 4 |
| ENGR-221 Electrical Circuit Analysis<br>ENGR-222 Electrical Circuit Analysis II<br>ENGR-223 Electrical Circuit Analysis III | 4<br>4<br>4 | EE 221 Circuits I<br>EE 223 Circuits II<br>EE 225 Circuits III | 4<br>4<br>4 |
| MTH-251 Calculus I | 5 | MATH 251 Differential Calculus | 4 |
| MTH-252 Calculus II | 5 | MATH 252 Integral Calculus | 4 |
| MTH-254 Vector Calculus | 5 | MATH 254N Vector Calculus I | 4 |
| MTH-256 Differential Equations [2] | 4 | MATH 321 Applied Differential Equations I [2] | 4 |
| MTH-243 Statistics I [2]<br>MTH-244 Statistics II [2] | 4<br>4 | MATH 361 Statistical Methods I [2] | 4 |
| MTH-261 Linear Algebra [2] | 4 | MATH 341 Linear Algebra [2] | 4 |
| PH-211 General Physics with Calculus | 5 | PHY 221 General Physics with Calculus | 4 |
| PH-212 General Physics with Calculus | 5 | PHY 222 General Physics with Calculus | 4 |
| PH-213 General Physics with Calculus | 5 | PHY 223 General Physics with Calculus | 4 |
| Social Science elective [3] | 6 | Social Science elective [3] | 6 |
| COMM-111 Public Speaking | 4 | SPE 111 Public Speaking | 3 |
| COMM-219 Small Group Communication [2] | 4 | SPE 321 Small Group & Team Communication [2] | 3 |
| WR-121 English Composition | 4 | WRI 121 English Composition | 3 |
| WR-122 English Composition | 4 | WRI 122 Argumentative Writing | 3 |
| WR-227 Technical Report Writing | 4 | WRI 227 Technical Report Writing | 3 |
| **Total Clackamas Credits [4]** | **115/ 117** | **Total Oregon Tech Degree Credits [4]** | **96/97** |

**In addition to the above courses, the courses listed below are also required for the Bachelor of Science in Renewable Energy Engineering and should be completed at Oregon Tech.**

| Oregon Institute of Technology Course Number & Title | Qtr. Units |
|---|---|
| CHE 260 Electrochemistry for Renewable Energy Applications | 4 |
| EE 321 Electronics I | 5 |
| EE 355 Control Systems Design | 4 |
| EE 419 Power Electronics | 4 |
| ENGR 267 Engineering Programming | 3 |
| ENGR 355 Thermodynamics | 3 |
| ENGR 465 Capstone Project | 6 |
| HIST 356 A History of Energy<br>or<br>HIST 357 History of Electrical Grid | 3 |
| MECH 318 Fluid Mechanics I<br>or<br>ENGR 318 Engineering Mechanics: Fluids | 4 |
| MECH 323 Heat Transfer I | 3 |
| REE 243 Electrical Power | 4 |
| REE 253 Electromechanical Energy Conversions | 3 |
| REE 331 Fuel Cells | 3 |
| REE 337 Materials for RE Applications<br>or<br>EE 343 Solid-State Electronic Devices | 3 |
| REE 412 Photovoltaic Systems | 3 |
| REE 413 Electrical Power Conversion Systems | 3 |
| REE 463 Energy Systems Instrumentation | 3 |
| REE 4XX Senior Sequence I | 3 |
| REE 4XX Senior Sequence II | 3 |
| REE 4XX Senior Sequence III | 3 |
| Renewable Energy Engineering electives | 15 |
| WRI 327 Advanced Technical Writing | 3 |
| **Additional Oregon Tech Credits [5]** | **88** |
| **Total Oregon Tech Degree Credits [6]** | **184/ 185** |

1. Students can transfer up to 9 credit hours of Humanities electives (Arts & Letters). **No more than 3 credits of activity or performing based humanities courses are accepted.** Choose from the following Clackamas prefixes: ART, ENG, HUM, MUS, PHL, R, TA, Second-year Foreign Languages or other courses designated as Humanities electives by the Oregon Tech Registrar's Office.
2. Does not count toward 60 upper-division credit requirement.
3. Students can transfer up to 6 credit hours of Social Science electives. Choose from the following Clackamas course prefixes: ANT, EC, GEO, HST, PS, PSY, SOC, SSC, and WS or other courses designated as Social Science electives by the Oregon Tech Registrar's Office.
4. Excess credits will transfer to Oregon Tech as general elective credit; these credits will **not** be used toward the Bachelor of Science in Renewable Energy Engineering degree.
5. Baccalaureate degree students must complete a minimum of 60 upper-division credits before a degree will be awarded. Upper-division is defined as 300- and 400-level classes at a bachelor's degree granting institution. A minimum of 45 credits must be from Oregon Tech.
6. Oregon Tech's Bachelor of Science in Renewable Energy Engineering requires 184/185 total credits.

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