



# ENLIGHTIUM ACADEMY

Ignitia™ Career and Technical Education  
Electives

Engineering and Innovation

Enlightium Academy invites you to open the door to career and college readiness with Career and Technical Education (CTE) courses from Alpha Omega Publications - Ignitia™.

These rigorous, hands-on courses for grades 7-12 promote critical thinking, emphasize problem solving, and encourage students to take responsibility for their own learning. With 24 CTE courses divided into six clusters, these courses put students on practical paths to post-graduate success.

Should you have any questions about the curriculum, please contact [support@enlightiumacademy.com](mailto:support@enlightiumacademy.com) or call Enlightium Academy Customer Support at (866) 488-4818 ext. 2017.

If you have questions about technical support or product configuration, please see the information below for Alpha Omega Publications.

### **Alpha Omega Publications Technical Support**

Alpha Omega Publications' technical support is Ignitia™'s full-service technical support system. We exist to promote and preserve our customers' satisfaction. Our services include:

- Technical Support
- Product Configuration and Update Management

Please use the following information to contact Alpha Omega Publications' technical support:

**Online:**

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**Telephone:**

Toll Free: 1-877-251-6662  
Monday –Friday 7 a.m. to 5 p.m. (CT)

## ENGINEERING AND INNOVATION

### COURSE OVERVIEW

The Engineering and Innovation course will provide students with an understanding of the field of engineering and introduction to the concepts of invention and innovation, as well as some of the skills and tools necessary to invent and innovate. This information will provide students with the ability to invent and innovate in their field of choice.

Students will learn details about the scope and nature of the field of engineering, as well as the Biblical principles that serve as the foundation for engineering and work in general. They will also learn about the history of invention and innovation and how those activities play a role in the advancement of human society. Students will be introduced to patents, regulations, and ethical and professional standards that apply in the fields of engineering and invention.

Students will also learn about analytical modeling and problem solving, interpreting the results of models and experiments, and understanding how bias impacts outcomes. In addition, students will learn about innovations and inventions in the fields of biomedicine and the environment and how those fields have impacted the health and wellbeing of society. Lastly, students will learn about career choices and organizations and resources available for individuals who wish to incorporate invention and innovation into their careers and lives.

Objectives:

- Understand the field of engineering as well as the concepts of invention and innovation.
- Understand the history of inventions and innovations and compare and contrast the roles of innovators, inventors, and engineers.
- Understand the changes that inventions have brought to society and how engineers and inventors collaborate with business.
- Understand how to search and apply for patents, find regulations, and research ethical and professional standards that apply in the fields of engineering and innovation.
- Understand the process of invention as problem solving, including using and interpreting models, and apply a model to a problem to solve it.
- Understand problem solving and innovation specifically in the fields of biomedicine and the environment.
- Identify career options and resources in interest areas, as well as understand how to bring a product or idea to market.

<b>ENGINEERING AND INNOVATION</b>	
<b>UNIT 1: INTRODUCTION TO ENGINEERING AND INNOVATION</b>	
<b>Assignment Titles</b>	
1. Course Overview	10. Engineers as Inventors
2. Who are Inventors and Innovators?	11. Project: Researching an Innovator
3. Exploring Engineering and Business	12. Life-Altering Innovation
4. Project: Innovating a Product	13. Quiz 2: The History of Invention
5. Who's the Hero: The Inventor or the Business?	14. Project: Special Project
6. Project: Starting a Business	15. Test
7. Quiz 1: Introduction	16. Course Project Part 1: History of Related Inventions
8. The History of Invention	17. Glossary and Credits
9. Project: Historical Inventions	

**ENGINEERING AND INNOVATION  
UNIT 2: PATENTS AND REGULATIONS**

**Assignment Titles**

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|---|---|
| 1. Provisional and Traditional Patents    | 10. The Balance Between Excessive Regulation and Encouraging Innovation |
| 2. Types of Patents                       | 11. Project: Apply for a Patent: Rules and Regulations                  |
| 3. Project: Comparing Patent Applications | 12. Quiz 2: Regulations and Innovations                                 |
| 4. Scope of Patent Protection             | 13. Project: Special Project  |
| 5. Project: Patent Search                 | 14. Test  |
| 6. Quiz 1: Patents                        | 15. Course Project Part 2: Patenting the Invention                      |
| 7. Laws and Regulations                   | 16. Glossary and Credits  |
| 8. Project: Apply for a Patent            |   |
| 9. Staying Current on New Laws            |   |

**ENGINEERING AND INNOVATION  
UNIT 3: ETHICAL AND PROFESSIONAL PRACTICES**

**Assignment Titles**

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|---|---|
| 1. Ethics in Innovation                                 | 8. Analytical Approach to Innovation              |
| 2. Project: Case Study: Ethical Innovation by a Company | 9. Project: Practicing Analytical Skills          |
| 3. Professional Standards                               | 10. Modeling in Innovation                        |
| 4. Project: Industry Ethics and Professional Standards  | 11. Project: Career Exploration                   |
| 5. Familiarization with Rules and Requirements          | 12. Quiz 2: Analytical Problem Solving            |
| 6. Quiz 1: Ethical and Professional Innovators          | 13. Project: Special Project                      |
| 7. Researching as Inventors                             | 14. Test  |
|   | 15. Course Project Part 3: Modeling the Invention |
|   | 16. Glossary and Credits                          |

**ENGINEERING AND INNOVATION  
UNIT 4: ANALYTICAL MODELING AND OUTCOMES ASSESSMENT**

**Assignment Titles**

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|--|---|
| 1. Analytical Modeling                             | 10. Interdependence: Innovation and Environment                             |
| 2. Project: Comparing Models                       | 11. Project: New Innovation for the Environment                             |
| 3. Choosing a Model and Limiting Bias              | 12. Quiz 2: Green and Environmental Issues in Innovation                    |
| 4. Interpreting Results                            | 13. Project: Special Project  |
| 5. Project: Career Exploration                     | 14. Test  |
| 6. Quiz 1: Analytical Model Selection and Outcomes | 15. Course Project Part 4: Solving Environmental Issues With This Invention |
| 7. Innovation and Environmental Sustainability     | 16. Glossary and Credits  |
| 8. Innovation in Environmental Causes              |   |
| 9. Project: Environmentally Conscious Innovation   |   |

**ENGINEERING AND INNOVATION  
UNIT 5: BIOMEDICINE AND EMERGING INNOVATIONS**

**Assignment Titles**

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|---|--|
| 1. Biomedical Innovation                                  | 8. Project: Your Invention                       |
| 2. Project: Impact of Biomedical Innovation               | 9. Careers in Innovation                         |
| 3. Resources in Innovation for Biomedicine                | 10. Resources for Innovators                     |
| 4. Project: Researching the Biomedical Innovation Process | 11. Project: Researching Innovative Groups       |
| 5. Advancement of Humankind from Biomedical Innovations   | 12. Quiz 2: Summary and Advancement              |
| 6. Quiz 1: Engineering and Technical Tools                | 13. Project: Special project                     |
| 7. Innovators, Inventions, and Modeling                   | 14. Test   |
|   | 15. Course Project Part 5: Identifying Resources |
|   | 16. Glossary and Credits                         |

**ENGINEERING AND INNOVATION  
UNIT 6: COURSE PROJECT, REVIEW, AND EXAM**

**Assignment Titles**

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|---|---------|
| 1. Course Project Part 6: Business Plan | 3. Exam |
| 2. Course Review                        |         |