3rd Class Power Engineering Coop

2020 FALL PECO 3100 A

PECO 3100 Applied Science
4 credits, 4 weeks, 120 hours

Topics include applied math, applied mechanics, thermodynamics, and applied science as identified in the Alberta Boilers Safety Association Reference Syllabus for the first paper of 3rd Class Part A Power Engineering.

Recommended Prerequisites
It is strongly recommended that students have Math 20/23 or Math 20 Applied, Physics 20 or Science 20 and English 20 (Grade 11).

Program Faculty

Chris Meyer
Program Chair
780-792-5724
Chris.Meyer@keyano.ca

Rahul Ponde
780-792-5126
Rahul.Ponde@keyano.ca

Brian MacDougall
780-792-5635
Brian.MacDougall@keyano.ca

Rifat Dyrmishi
780-792-2681
Rifat.Dyrmishi@keyano.ca

Gallage DeSilva
Gallage.Desilva@keyano.ca

Robert Marsh
780-792-5130
Robert.Marsh@keyano.ca

Indika Arachchi
Indika.Arachchi@keyano.ca

Office hours
As per request from students, instructors are available outside of instructional hours. Please arrange a time with your instructor.
Required Resources


Course Outcomes

1. Demonstrate knowledge in basic mathematics, trigonometry, mensuration, Algebra, logarithms, problem solving, vectors, forces & friction, work done in objects in motion, power, energy and Linear & Angular motion relationships.

2. Demonstrate knowledge of strength of Materials, flow, heat, state changes, density, pressures, simple machines, bending of beams, calorimetry, thermal expansion and heat transfer.

3. Demonstrate knowledge of saturation of steam, steam tables, temperature-enthalpy, evaporation, calculations, gas laws & equations, expansion of gases, and calculate work done on gases.

4. Analyze chemistry fundamentals including electronegativity, periodic table of elements, organic chemistry, water treatment and metallurgy & materials.

5. Demonstrate knowledge of the principles of corrosion that affect boilers, pressure vessels and pressure piping including galvanic corrosion, atmospheric, stray current, biological, along with inspection techniques.

6. Demonstrate knowledge of process & instrument flow drawings, material balance drawings, construction drawings and equipment layout drawings.

Evaluation

The minimum standard for passing all S & E exams and the overall course is a grade of 65%. In addition, a PASS mark for completion of six month work experience co-op is required.

Chapter and Unit Quizzes……..10%
Section Test 1………………………... 20%
Section Test 2 ………………….. 20%
E – Exam………………………….50%
Total…………………………….. 100%

*Please note that this change in evaluation criteria is a unique change directly related to the circumstances from COVID-19*
Learning Outcomes

1. Solve problems using algebraic operations, including equations and logarithms.
2. Explain trigonometric concepts and solve problems involving trigonometry.
3. Solve problems involving the areas of plane figures and the surface areas and volumes of three-dimensional objects.
4. Explain concepts and solve problems involving vectors, force systems and friction.
5. Explain concepts and solve problems involving work, power, energy, linear motion, and angular motion.
6. Explain concepts and solve problems involving material stresses and bending of beams.
7. Explain concepts and solve problems involving simple machines and fluids.
8. Explain heat terminology and perform heat calculations during changes of state and calorimeter tests.
9. Explain concepts and perform calculations involving the thermal expansions of solids and liquids and heat transferred through a substance.
10. Define properties of saturated and superheated steam and, using information from the steam tables, calculate the heat required to produce steam at various conditions; determine the evaporation in steam boilers.
11. Explain the laws of perfect gases and perform calculations involving the expansion and compression of gases.
12. Explain the fundamental principles in the structure, formation and interaction of chemical compounds and the importance of chemistry in industrial operations.
13. Explain the production, properties and applications of metallic and non-metallic materials.
14. Explain the mechanisms that cause corrosion and the methods used to monitor and control corrosion.
15. Identify and interpret components of typical engineered drawings used in industry.
Performance Requirements

Student Responsibilities
It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar. The Keyano College credit calendar also has information about Student Rights and Code of Conduct. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Code of Conduct Policies.

Student Attendance
Class attendance is useful for two reasons. First, class attendance maximizes a student’s learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and notes that may be due.

Academic Misconduct
Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person’s work as one’s own;
- The use of unauthorized aids in assignments or examinations (cheating);
- Collusion or the unauthorized collaboration with others in preparing work;
- The deliberate misrepresentation of qualifications;
- The willful distortion of results or data;
- Substitution in an examination by another person;
- Handing in the same unchanged work as submitted for another assignment; and
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work may not be graded until you show this signed certificate.
Specialized Supports
The Student Services department is committed to Keyano students and their academic success. There are a variety of student supports available at Keyano College. Due to the continuing situation with the Covid-19 pandemic, the offered support services will be implemented differently this semester by being provided mostly virtually. In-person service can be requested as needed. All Alberta Health Services guidelines will be followed for in-person appointments—wear a mask, maintain two meters of physical distance, use hand sanitizer, and stay home if you are unwell.

All student services are available during Keyano business hours: Monday to Friday, 8h30-16h30.
The Library has evening and weekend hours. Please check keyano.ca/library for current hours.

Accessibility Services: provides accommodations for students with disabilities. Students with documented disabilities, or who suspect a disability, can meet with a Learning Strategist to discuss their current learning barriers and possible accommodations. Students who have accessed accommodations in the past are encouraged to contact us to request them for the semester. Please note that requesting accommodations is a process and requires time to arrange. Contact us as soon as you know you may require accommodations. For accessibility services supports and to book a virtual appointment, please contact accessibility.services@keyano.ca.

Accessibility Services also provides individual and group learning strategy instruction for all students, as well as technology training and supports to enhance learning. Meet with a Learning Strategist to learn studying and test-taking strategies for online classes. Schedule an appointment with the Assistive Technology Specialist to explore technology tools for learning. Book an appointment today by emailing accessibility.services@keyano.ca.

Academic Success Coaching: offers you support and access to resources for your academic success to help you to find the Keys to your Success. The Academic Success Coach will work with you to develop an academic success plan, develop your study and time management skills, and connect you with the right resources here at Keyano. Academic.success@keyano.ca is the best way to access resources during virtual service delivery.

Wellness Services: offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. All individual appointments will continue virtually.

Wellness Services welcomes students to participate in any of the virtual group sessions offered throughout the academic year addressing topics including mindfulness and test anxiety.

Individual virtual appointments can be made by emailing wellness.services@keyano.ca.
Library Services: provides students with research and information supports as they engage in their studies. Library staff are available to support you both virtually and in person during the fall semester. For library service supports and inquiries, please email askthelibrary@keyano.ca.

Individual support with the Information Librarian will be provided virtually. Appointments can be requested by email or by placing a Book a Librarian request using the online form found here.

Research and Subject Guides are helpful resources when conducting research or addressing your information needs. To view a subject or course specific guide, use the following Subject Guides link.

To access additional research resources, including Citation Guides (APA, MLA, Chicago, or IEEE), go to the Research Help Library page.

Skill Centre: provides academic support services to students registered in credit programs at Keyano College in the form of tutoring, writing support groups, facilitated study groups, workshops and study space. Tutoring services are free to Keyano students. Tutoring is available for Math, Writing, English, and Science subject areas.

While most courses are being offered online, the Skill Center will be offering mostly virtual tutoring services and in-person sessions as requested. Please email Skill.centre@keyano.ca to get in contact with our tutoring staff.

For the most up to date information on how to book a tutoring session, please view the Keyano Skill Centre homepage.

E-Learning
Technology and internet will impact your online learning experience. It's important that you are able to watch an online video and other course materials, take online quizzes, and participate in a live class with your instructor and other students.

Keyano College operates in a Windows based environment and having the correct tools for online learning is important. Here's a list of recommended system requirements for Fall 2020.

Internet Speed
Minimum Internet speeds of 5 Mbps.
Recommended Internet speeds of 25 Mbps (especially if you are sharing your internet at home). Check your internet speed with Fast.com.
System requirements:

<table>
<thead>
<tr>
<th>Microsoft Windows</th>
<th>Apple</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum Requirements:</strong></td>
<td><strong>Minimum Requirements:</strong></td>
</tr>
<tr>
<td>· A Windows 10 <strong>computer/laptop</strong>&lt;br&gt;· Minimum 4GB of RAM.</td>
<td>· A Macintosh (V10.14 and above) <strong>computer/laptop</strong>&lt;br&gt;· Minimum 4GB of RAM.</td>
</tr>
<tr>
<td>· 10GB+ available hard drive storage.</td>
<td>· 10GB+ available hard drive storage.</td>
</tr>
<tr>
<td>· Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <strong>Microsoft Office</strong> software is free to all Keyano students and employees.</td>
<td>· Enough available hard drive space to install the Microsoft Office suite (approximately 3GB). <strong>Microsoft Office</strong> software is free to all Keyano students and employees.</td>
</tr>
<tr>
<td>· Microphone, webcam and speakers. A headset with a microphone is recommended.</td>
<td>· Microphone, webcam and speakers. A headset with a microphone is recommended.</td>
</tr>
<tr>
<td>· System updates must be regularly installed.</td>
<td>· System updates must be regularly installed.</td>
</tr>
<tr>
<td>· Anti-Virus / Anti-Malware software</td>
<td>· Anti-Virus / Anti-Malware software.</td>
</tr>
</tbody>
</table>

**Recommended Requirements**

| | |
| · 8GB of RAM | · 8GB of RAM |
| · A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and Office 365. | · A method of backing up/synchronizing to local or cloud-based storage such as OneDrive is highly recommended. This is included if you complete the setup of KeyanoMail and Office 365. |

Chromebooks are **not** recommended as they are not compatible with testing lockdown browsers.

A Microsoft Surface or iPad or iPad Pro may be possible alternatives in some program areas.

**Specific department requirements:**
Business and OA programs require Windows 10. Other programs may utilize Windows based tools as well.

**Computer Software**
Students will be able to get access to Microsoft Office 365 for Free using Keyano Credentials by [clicking here](https://keyano.ca).
Recording of lectures and Intellectual Property
Students may only record a lecture if explicit permission is provided by the instructor or by Accessibility Services. Even if students have permission to record a lecture or lecture materials, students may not publish any of the lectures or lecture materials, this includes any recordings, slides, instructor notes, etc. on any platform. Thus no student is allowed to publish or sell instructor notes without formal written permission. It is important to recognize that the Canadian Copyright Act contains provisions for intellectual property.

ITS Helpdesk
If you are having issues with your student account, you can contact the ITS Helpdesk by emailing its.helpdesk@keyano.ca or calling 780-791-4965.