NOTE to prospective students: This syllabus is intended to provide students who are considering taking this course an idea of what they will be learning. A more detailed syllabus will be available on the course site for enrolled students and may be more current than this sample syllabus. Summer term courses may be accelerated – please check the Ecampus Schedule of Classes for more information.

CH 374
Course NAME. For Example: Introduction to Statistics.

COURSE CREDITS:
(3) This course combines approximately 90 hours of instruction, online activities, and assignments for 3 credits.

PREREQUISITES, CO-REQUISITES AND ENFORCED PREREQUISITES:
PREREQS: Completion of baccalaureate core in physical science.
Instructor information - Completion of the BACC CORE physical science requirement is required. Numerical calculations of risk are used, so this course is not appropriate for the innumerate. I REPEAT--we expect you to use numbers in addressing most issues. If you suffer from "math anxiety" or find numerical work to be troublesome, you probably should not take this course. Problem solving skills equivalent to those used in the Ch2xx sequences or PHY 2xx sequences are needed.

COURSE DESCRIPTION FROM CATALOG
CH 374. TECHNOLOGY, ENERGY, AND RISK (3).
Decision-making in a technical, democratic society. Discussion of current issues such as acid rain, toxic organic chemicals in the environment, energy resources, etc. Does not meet the prereq for any other chemistry course. Does not meet requirements for chemistry minor. (Bacc Core Course) PREREQS: Completion of baccalaureate core in physical science.
Baccalaureate Core Course Attributes: Core, Synth, Sci/Tech/Soc

CONTACT INFORMATION:
W. Loveland
B123 Radiation Center
Oregon State University
Corvallis, OR 97331
lovelanw@onid.orst.edu

This course is offered through Oregon State University Extended Campus. For more information, contact:
Web: ecampus.oregonstate.edu  Email: ecampus@oregonstate.edu  Telephone: 800-667-1465
Sample syllabi may not have the most up-to-date information. For accuracy, please check the [ECampus Schedule of Classes](#) to see the most current instructor information. You can search for contact information by name from the OSU Home Page.

**LEARNING RESOURCES:**

- The textbooks used in this course are:

**NOTE:** For textbook accuracy, please always check the textbook list at the [OSU Bookstore website](#). Sample syllabi may not have the most up-to-date information.

Students can also click the ‘[OSU Beaver Store](#)’ link associated with the course information in the [Ecampus schedule of classes](#) for course textbook information and ordering.

**COURSE SPECIFIC MEASURABLE STUDENT LEARNING OUTCOMES:**

**What will I learn in this course?**

- At the conclusion of the course, you should be able to:
  - perform "order of magnitude, back of the envelope" calculations of any physical quantity, such as the number of dentists in the US
  - be able to express risk in a variety of ways and to interconvert between the various measures of risk.
  - understand the YPLL method of assessing risk.
  - express the uncertainty in risk estimates
  - understand the numerical estimates of the value of a human life and how they are arrived at
  - understand how fault tree estimates of risk are arrived at and demonstrate your ability to independently set up and evaluate risk fault trees.
  - understand and use psychometric factors to evaluate the perception of risk
  - understand risk management and be able to evaluate optimal risk
  - understand the role of values in risk assessment and to identify your personal values in regard to risk management
  - understand how risk assessment is applied to evaluating the risk posed by carcinogens
  - be able to calculate HERP values and understand them.
• understand various type of dose response curves and to use those curves to evaluate the risk involved in exposure to carcinogens
• understand the work of Ames et al. in regard to plant based carcinogens and low risk carcinogens.
• understand some basic principles of toxicology and to apply them to the evaluation of the risk posed by low dose carcinogens
• use and understand the basic units of energy, power and energy flow in society
• understand world, US and PNW energy use by sector and overall.
• understand the concept of exponential growth and be able to do calculations using this concept.
• understand the concepts of reserves and resources of fossil fuels in the world and the US and their historical
• understand the concept of peak oil and its application to environmental issues
• use the laws of thermodynamics to evaluate energy conservation strategies
• understand the basic science behind nuclear energy, the issues of power generation and waste disposal.
• evaluate the role of renewable resources in meeting PNW, US and world energy needs
• understand the science of the greenhouse effect and the data on global warming and use that information to evaluate policies.
• understand the science of ozone depletion, the political policies that have evolved to deal with it and future developments
• to understand the causes of acid rain, the effects of acid rain, the geographic aspects of acid rain and strategies to combat the effects of acid rain.

WHAT ARE THE GENERAL LEARNING OUTCOMES FOR BACC CORE COURSES LIKE THIS ONE?
• Students will:
  • Analyze relationships among science, technology, and society using critical perspectives or examples from historical, political, or economic disciplines.
  • Analyze the role of science and technology in shaping diverse fields of study over time.
  • Articulate in writing a critical perspective on issues involving science, technology, and society using evidence as support.

COURSE CONTENT AND POLICIES:

What is this course?
This course is a BACC CORE course in the Synthesis category of Science, Technology and Society. In this "capstone" course elements of science, social science, philosophy, etc. are brought together. The subject material of the course is risk assessment and its application to energy technologies and various topics in environmental chemistry.
We will cover a variety of issues at the interface between science/technology and society, for example: risk assessment, the sources and uses of energy, energy resources, the environmental problems of some energy sources (acid rain, air pollution, release of radioactivity), the application of risk assessment to these and other problems, other environmental problems such as toxic organic compounds in the environment, etc. We will
deal not only with the scientific and technological matters, but also with the ways in which the media cover some of them and how the public perceives them. We shall emphasize different perspectives (world, US, PNW) in discussing these issues. We will emphasize understanding the technical components of these issues.

What are the class requirements, and how is this course graded?
You will be graded on three types of work: tests (400 points), a critical paper (100 points) and your participation in online class discussions (DECISION MAKERS) (100 points). An approximate grading scale is A > 450, B> 380, C> 310, and D > 250. The tests include points based upon scores and points based upon number of attempts to take a test. The final grading scale will be decided after the course is over.
Information of how to work the tests is available under the "Assignments" section of the course website.
A passing grade must include points from the tests, the critical paper and the discussions. Failure to complete any of these sections will result in a failing grade.

Critical Paper
One of the requirements of this class is to complete a critical, or thesis paper. Further information concerning this paper is available under the "Assignments" section of this webpage. The critical paper is due by 1700 4 DECEMBER, 2015. Please send all papers to lovelanw@onid.orst.edu by the indicated deadline.

Class Discussion
All students are required to participate in class discussions. These threaded discussions take place on the Discussion Board (under Communication). On this board, you will find nine posted discussion items or Decision-Makers. You should make a contribution (which we will evaluate) to each discussion. All discussions are open until the end of classes and will be evaluated at that time.

What topics will be discussed?
Here is the tentative list of topics to be discussed, in approximate order of introduction:

Topic:
- The Risks of Life
- Measurement of Risk
- Guesstimates
- Assessment of Risk
- The Value of Human Life
- Fault Tree Analysis
- Perception of Risk
- Risk Management
- Risk-Benefit Calculations
- Risk Assessment with Carcinogens
• Risk Assessment with Toxic Chemicals
• Summary of Risk Assessment
• Energy Definitions and Units
• The Flow of Energy in US Society
• Coal, Oil, and Gas
• Heat Engines
• Energy Conservation
• Nuclear Energy
• Risk Assessment and Nuclear Power
• Global Warming
• Stratospheric Ozone Depletion
• Acid Rain
• Air Pollution
• Water Pollution

TENTATIVE SCHEDULE
CH 374 FALL 2015
TENTATIVE SCHEDULE

<table>
<thead>
<tr>
<th>DATE</th>
<th>SUBJECT</th>
<th>READING</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 SEPT</td>
<td>THE RISKS OF LIFE</td>
<td>RR 5, THE MEASUREMENT OF RISK</td>
</tr>
<tr>
<td>30 SEPT</td>
<td>GUESSTIMATION</td>
<td>G CH1, CH3</td>
</tr>
<tr>
<td>5 OCT</td>
<td>THE ASSESSMENT OF RISK</td>
<td>G CH 11, RR55</td>
</tr>
<tr>
<td>7 OCT</td>
<td>NO CLASS</td>
<td></td>
</tr>
<tr>
<td>9 OCT</td>
<td>TEST 1 DUE BY 1700</td>
<td></td>
</tr>
<tr>
<td>12 OCT</td>
<td>THE VALUE OF HUMAN LIFE</td>
<td></td>
</tr>
<tr>
<td>14 OCT</td>
<td>PERCEPTION OF RISK</td>
<td>RR 61, RR 30</td>
</tr>
<tr>
<td>19 OCT</td>
<td>RISK MANAGEMENT</td>
<td>RR 195, THE ROLE OF VALUES</td>
</tr>
<tr>
<td>21 OCT</td>
<td>CARCINOGENS, TOXIC CHEMICALS</td>
<td>RR 76, RR 193</td>
</tr>
<tr>
<td>23 OCT</td>
<td>TEST 2 DUE BY 1700</td>
<td></td>
</tr>
<tr>
<td>27 OCT</td>
<td>TOXICOLOGY</td>
<td>RR 165, RR143</td>
</tr>
<tr>
<td>29 OCT</td>
<td>SUMMARY OF RISK ASSESSMENT</td>
<td>RR 103</td>
</tr>
<tr>
<td>2 NOV</td>
<td>ENERGY FUNDAMENTALS</td>
<td>G CH 6, E IV</td>
</tr>
<tr>
<td>4 NOV</td>
<td>FLOW OF ENERGY</td>
<td>E II</td>
</tr>
<tr>
<td>6 NOV</td>
<td>TEST 3 DUE BY 1700</td>
<td></td>
</tr>
<tr>
<td>9 NOV</td>
<td>FOSSIL FUELS</td>
<td>G CH 9, E 14, E 4-7</td>
</tr>
<tr>
<td>11 NOV</td>
<td>NUCLEAR POWER</td>
<td>E-11, E-1, RR247</td>
</tr>
<tr>
<td>16 NOV</td>
<td>RENEWABLES</td>
<td>E 15, E 13</td>
</tr>
<tr>
<td>18 NOV</td>
<td>CLIMATE CHANGE</td>
<td>G CH 10, E 3,</td>
</tr>
</tbody>
</table>
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20 NOV  TEST 4 DUE BY 1700
23 NOV  OZONE DEPLETION
25 NOV  NO CLASS
30 NOV  ACID RAIN
2 DEC  SUMMARY
4 DEC  CRITICAL PAPER DUE, ALL DECISION MAKERS DUE

THERE IS NO FINAL EXAM.

G=GUESSTIMATION
RR=READINGS IN RISK
E=ENERGY FOR FUTURE PRESIDENTS

EVALUATION OF STUDENT PERFORMANCE:

What are the class requirements, and how is this course graded? You will be graded on three types of work: tests (400 points), a critical paper (100 points) and your participation in online class discussions (DECISION MAKERS) (100 points). An approximate grading scale is A > 450, B > 380, C > 310, and D > 250. The tests include points based upon scores and points based upon number of attempts to take a test. The final grading scale will be decided after the course is over. Information of how to work the tests is available under the "Assignments" section of the course website.

Course site login information
Information on how to login to your course site can be found HERE.

COURSE SITE LOGIN INFORMATION
Information on how to login to your course site can be found HERE.

STATEMENT REGARDING STUDENTS WITH DISABILITIES

Oregon State University is committed to student success; however, we do not require students to use accommodations nor will we provide them unless they are requested by the student. The student, as a legal adult, is responsible to request appropriate accommodations. The student must take the lead in applying to Disability Access Services (DAS) and submit requests for accommodations each term through DAS Online. OSU students apply to DAS and request accommodations at our Getting Started with DAS page.
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

**ACADEMIC INTEGRITY AND STUDENT CONDUCT (OSU POLICY)**

Students are expected to be honest and ethical in their academic work. Intentional acts of academic dishonesty such as cheating or plagiarism may be penalized by imposing an “F” grade in the course.

Student conduct is governed by the universities policies, as explained in the Office of the Dean of Student Life: Student Conduct and Community Standards. In an academic community, students and faculty, and staff each have responsibility for maintaining an appropriate learning environment, whether online or in the classroom. Students, faculty, and staff have the responsibility to treat each other with understanding, dignity, and respect.

Students are expected to conduct themselves in the course (e.g. on discussion boards, email postings, etc.) in compliance with the university's regulations regarding civility. Students will be expected to treat all others with the same respect as they would want afforded to themselves. Disrespectful behavior (such as harassing behavior, personal insults, inappropriate language) or disruptive behaviors are unacceptable and can result in sanctions as defined by Student Conduct and Community Standards.

For more info on these topics please see:

- [Statement of Expectations for Student Conduct](#)
- [Student Conduct and Community Standards - Offenses](#)
- [Policy On Disruptive Behavior](#)

**PLAGIARISM**

You are expected to submit your own work in all your assignments, postings to the discussion board, and other communications, and to clearly give credit to the work of others when you use it. Academic dishonesty will result in a grade of “F.”

- [Statement of Expectations for Student Conduct](#)
- [Avoiding Academic Dishonesty](#)

**TECHNICAL ASSISTANCE**

This course is offered through Oregon State University Extended Campus. For more information, contact:

Web: ecampus.oregonstate.edu    Email: ecampus@oregonstate.edu    Tel: 800-667-1465
If you experience computer difficulties, need help downloading a browser or plug-in, assistance logging into the course, or if you experience any errors or problems while in your online course, contact the OSU Help Desk for assistance. You can call (541) 737-3474, email osuhelpdesk@oregonstate.edu or visit the OSU Computer Helpdesk online.

- COURSE DEMO
- GETTING STARTED

TUTORING
For information about possible tutoring for this course, please visit our Ecampus NetTutor page. Other resources include:

- Writing Center
- Online Writing Lab

STUDENT EVALUATION OF TEACHING
The online Student Evaluation of Teaching form will be available in week 9 and close at the end of finals week. Students will be sent instructions via ONID by the Office of Academic Programs, Assessment, and Accreditation. Students will log in to “Student Online Services” to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted. Course evaluation results are very important and are used to help improve courses and the learning experience of future students. Results from questions are tabulated anonymously and go directly to instructors and unit heads/supervisors. Unless a comment is “signed,” which will associate a name with a comment, student comments on the open-ended questions are anonymous and forwarded to each instructor. “Signed” comments are forwarded to the unit head/supervisor.

REFUND POLICY INFORMATION
Please see the Ecampus website for policy information on refunds and late fees.