Conrad Grebel University College / University of Waterloo

PACS 301: Engineering and Peace
Fall 2017 (rev. 13 Sep 2017)

Class Time: Wednesdays 7:00-9:50 PM
Location: Fretz Seminar Room (4224), Kindred Credit Union Centre for Peace Advancement
Conrad Grebel University College

Instructor: Paul Heidebrecht
Office Hours: By appointment
Office Location: Room 4203
Phone: 519-885-0220 x24225
Email: pheidebr@uwaterloo.ca (best way to reach me)

Course Description:
This course is built on the conviction that the kinds of problems engineers seek to address, and the ways they seek to address them, should matter for anyone interested in advancing peace in the world. Topics include: historical connections between the discipline of engineering and warfare, understanding the engineering method and mindset, and technological frontiers for peacebuilding.

Intended to test the premise of PACS 101 (Peace is Everybody's Business), the initial offering of this course verified that Peace and Conflict Studies has something important to offer to the field of engineering, and that engineering as a discipline has something important to contribute to the advancement of peace. This course is also intended to encourage and equip students to tackle pressing social challenges through other curricular (e.g., 4th year design projects) and co-curricular (e.g., work terms and entrepreneurship programming) offerings at the University of Waterloo.

Course Learning Outcomes:
By the end of the term, students should be able to:
1. clearly articulate why peace is the business of engineers;
2. convince non-engineers that engineers can contribute to building sustainable peace;
3. augment their approach to analyzing and solving problems with insights from peacebuilding theory and practice; and
4. identify opportunities to apply their expertise and passions to make a meaningful social impact.

Required Reading Materials:
Required readings for each class are highlighted in the weekly course outline and course bibliography that follows, and are all accessible online or via LEARN. The length of reading assignments and other preparation will vary from week to week.

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1 I would like to acknowledge that this class meets on the traditional territory of the Attawandaron (Neutral), Anishnaabeg, and Haudenosaunee peoples. Conrad Grebel University College is situated on the Haldimand Tract, the land promised to the Six Nations that includes six miles on each side of the Grand River.
Course Assessment:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weighting</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>Class participation</td>
<td>10%</td>
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<tr>
<td>In-class assignments</td>
<td>50% (best 10 of 12 x 5% each)</td>
<td>Weekly</td>
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<tr>
<td>Tests (2)</td>
<td>15% (7.5% each)</td>
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<tr>
<td>Final Exam (take home)</td>
<td>25%</td>
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Additional Assignment Instructions:

Every class session will include an assignment which will require students to work individually and/or in teams to address a problem or complete an exercise related to the topic of the day. This will be a major component of student evaluation, and detailed instructions will be provided for each individual assignment. Assignments will NOT be accepted for any missed classes.

Assessment of class participation will be based on demonstrated student engagement with the course material. Key indicators of engagement include:

- Grasp of assigned readings.
- Quality of questions and responses. Students should come to class prepared to raise questions related to topic of the day. Of course, active and informed participation is characterized not only by the number and quality of spoken observations, but also by attentive listening.
- Contribution to cultivating a community of learning. In class discussions, students are encouraged to be honest and forthright, but also sensitive and tactful. It is not likely that we all will agree on all issues, but each person should be respected.
- Involvement in related learning opportunities beyond the class. Throughout the semester I will be drawing attention to events and news items that are related to the topic under discussion for a particular day, or to the course objectives. In order to help make this practice meaningful, all students are encouraged to send me events and news items you come across on a regular basis, either by e-mail, or by passing along a printed copy prior to the start of class.

Additional UWaterloo Course Policies:

**Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility. See the UWaterloo Academic Integrity webpage and the Arts Academic Integrity webpage for more information.

**Discipline:** A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline. For typical penalties check Guidelines for the Assessment of Penalties.

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department’s administrative assistant who will provide further assistance.
Appeals: A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 - Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 - Student Appeals.

Accommodation for Students with Disabilities:
A note for students with disabilities: The AccessAbility Services office, located on the first floor of the Needles Hall extension (1401), collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term.

Mental Health Support:
All of us need a support system. The faculty and staff in Arts encourage students to seek out mental health supports if they are needed.

On Campus:
- Counselling Services: counselling.services@uwaterloo.ca / 519-888-4567 xt 32655
- MATES: one-to-one peer support program offered by Federation of Students (FEDS) and Counselling Services
- Health Services Emergency service: located across the creek from Student Life Centre

Off campus, 24/7:
- Good2Talk: Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Grand River Hospital: Emergency care for mental health crisis. Phone: 519-749-433 ext. 6880
- Here 24/7: Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- OK2BME: set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 extension 213

Full details can be found online at the Faculty of ARTS website
Download UWWaterloo and regional mental health resources (PDF)
Download the WatSafe app to your phone to quickly access mental health support information
The following schedule will be revised on an ongoing basis to reflect changes in reading assignments and refinements to the course schedule. All changes will be announced in advance in class and updated on Waterloo LEARN.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Reading Assignment</th>
<th>Additional Notes</th>
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<tbody>
<tr>
<td>1</td>
<td>Sep. 13</td>
<td>Course introduction: Why peace is everybody’s business</td>
<td>N/a</td>
<td>Guest: Taylor Legere; In-class assignment #1 due</td>
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</tbody>
</table>
| 2    | Sep. 20   | Why has war been the business of so many engineers?     | 1. Blank, “Hidden in Plain Sight: The Secret History of Silicon Valley”  
2. Nieusma and Blue, “Engineering and War”  
3. What’s Yours is Mine review | Guest: Tom Slee; In-class assignment #2 due                                     |
| 3    | Sep. 27   | Public event with Patrick Meier: “Humanitarian Robotics in Action”  
2. Gillis, Disarmament: A Basic Guide (chapters 3-11)  
3. Singer, “Introduction: Scenes from a Robot War” | Guest: Ryan Gariepy; In-class assignment #4 due; Test #1                             |
2. Gambetta and Hertog, “Uncivil Engineers” | Guest: TBD; In-class assignment #5 due                                               |
2. Petroski, “The Value of Failure” | Guest: Stephanie Rozek; In-class assignment #6 due                                   |
2. Miller, “Is ‘Design Thinking’ the New Liberal Arts?”  
3. United Nations, Sustainable Development Goals | Guests: Bruce Taylor; Shahid Mawji and Dhruv Guliani (Bamboo Lab); In-class assignment #7 due |
| 8    | Nov. 1    | Peacebuilding for people who aren’t peacebuilding professionals | 1. Docherty and Lantz-Simmons, “What is Old is New Again” | Guests: Larry Willms; Katie Gingerich (TREE); In-class assignment #8 due; Test #2 |
Course Schedule, continued:

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<thead>
<tr>
<th>Week</th>
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<th>Additional Notes</th>
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<tr>
<td>9</td>
<td>Nov. 8*</td>
<td>Public event with Duncan Green: “How Change Happens”</td>
<td>1. Green, “A Power and Systems Approach”</td>
<td>In-class assignment #9 due</td>
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<td>*Meet at the Vanstone Lecture Hall, St. Jerome’s University</td>
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<td>10</td>
<td>Nov. 15</td>
<td>The technological underpinnings of positive peace</td>
<td>1. Backgrounder on EWB Case Competition</td>
<td>Guest: Richard Yim; Toni Ogunmade</td>
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<td>2. Centre for Security Governance, “PeaceTech: Harnessing Technology to Advance</td>
<td>(Engineers Without Borders UWaterloo</td>
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<td></td>
<td>Peacebuilding”</td>
<td>Chapter)</td>
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<td>3. “#Peacetech”</td>
<td>In-class assignment #10 due</td>
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<td>11</td>
<td>Nov. 22*</td>
<td>Conflict on the project team</td>
<td>1. ADR Institute of Canada, “Frequently Asked Questions”</td>
<td>Guests: Crista Renner and Jessica Dyck;</td>
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<td>*Meet at the Velocity Garage, The Tannery, 151 Charles St. W.,</td>
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<td>Wali Muhammad (Behavioural Skills</td>
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<td>Kitchener</td>
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<td>Company); In-class assignment</td>
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<td>#11 due</td>
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<td>12</td>
<td>Nov. 29*</td>
<td>Engineers as social innovators</td>
<td>1. National Academy of Engineering, “Grand Challenges for Engineering”</td>
<td>Guest: Tania Del Matto; In-class</td>
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<td>*Meet at St. Paul’s GreenHouse]</td>
<td>2. Riley, “We’ve Been Framed!”</td>
<td>assignment #12 due; Take home Final</td>
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<td>Exam distributed</td>
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<td>Final Exam due via</td>
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<td>LEARN Dropbox</td>
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Required Reading Bibliography:
Required Reading Bibliography, continued:


What’s Yours is Mine by Tom Slee: reviews and other coverage. [http://tomslee.net/2016/02/whats-yours-is-mine-reviews-and-other-coverage.html](http://tomslee.net/2016/02/whats-yours-is-mine-reviews-and-other-coverage.html)