Western University - Faculty of Engineering  
Department of Civil and Environmental Engineering  

CEE 3328b – Appropriate Technology for International Development  
Course Outline 2019/20

This course introduces students to the background, conceptual underpinnings, and practical implementation aspects of Appropriate Technology for the purposes of sustainable development. As part of a series of courses in the Structural Engineering and International Development, and Environmental Engineering and International Development programs, the goal is to equip civil engineering students with the skills to successfully undertake challenges in developing countries, countries in transition, and at-need communities in developed countries. The general objectives are for the student to become able to:

- Develop a knowledge base in the background of the appropriate technology movement, identifying its motivation, principles, and evolution.
- Formulate specific engineering challenges existing in developing regions and demonstrate appreciation for the region-specific context of proposed appropriate technology solutions.
- Identify how the standard engineering design process needs to accommodate appropriate technology principles and projects.
- Develop a knowledge base in key fields where technology, appropriately applied, can significantly impact development including water and wastewater treatment, solid waste management, construction, health, communication, and energy supply.
- Design solutions to open-ended engineering problems in the context of appropriate technology.
- Improve written and oral communication skills associated with complex engineering and development concepts by undertaking individual written compositions, participating in interactive discussions, and presenting projects both orally and in written form.
- Demonstrate professionalism by understanding the roles and responsibilities of the professional engineering in society.
- Appreciate the importance of economics, business practices, and politics in successfully implementing appropriate technology.
- Demonstrate the ability to make life-long learning a priority by managing and taking responsibility for one’s own learning and bringing additional educational resources to the group.

Calendar Copy:  
The course will introduce the concept of appropriate technology in the context of international development to students. It will examine the application of technologies to critical human needs in development, such as housing, transportation, provision of safe water and sanitation, waste management, and energy (0.5 course).

Contact Hours:  
3 lecture hours per week, 2 tutorial hours per week.
Attendance at the lectures is mandatory.

**Prequisites:** Completion of the second year of the Civil Engineering program

**Corequisites:** None

**Antirequisite:** None

**Note:** It is the student's responsibility to ensure that all Prerequisite and Corequisite conditions are met or that special permission to waive these requirements has been granted by the Faculty. It is also the student's responsibility to ensure that they have not taken a course listed as an Antirequisite.

The student may be dropped from the course or not given credit for the course towards their degree if they violate the Prerequisite, Corequisite or Antirequisite conditions.

**Instructor:**
Dr. Clare Robinson, SEB 3041, email: crobinson@eng.uwo.ca. **Administrative Support:** Room 3005

**Textbooks:**
- Small Is Beautiful: Economics as If People Mattered [Paperback], E. F. Schumacher (Author), Publisher: Harper Perennial; Reprint edition (Oct 19 2010)
- Mastering the Machine Revisited: Poverty, Aid and Technology [Paperback], Ian Smillie (Author), Publisher: Stylus Publishing, LLC (Dec 1 2000)

**Other References:**

Additional reading material will be provided through the course website.

**Computing:**
Written assignments must be submitted as word processed documents in WORD or PDF formats. All assignments will be submitted via the course website using TURNITIN.

**Units:**
SI units will be used in lectures and examinations

**Course Style and Specific Learning Objectives:**
The pedagogical model is collaborative learning, so the classes will be based on discussions and case studies rather than lectures. Students are expected to come to class prepared to discuss the weekly readings. The course instructor and teaching assistant will provide mentorship and guidance for the students to undertake individual and collective learning processes focused on achieving the course objectives. A substantial reading list will be employed that will provide material for digestion, synthesis, and reflection in individual written assignments and group
discussions in class. Students will research topics and present their findings to the class. Guest speakers will provide case studies that illustrate practical applications of the topic material. Projects will explore designs for practical problems.

By the end of the course, the student should be able to articulate his/her own learning with respect to these key points aligned with the course’s specific learning objectives:

- Describe several contexts in which appropriate technology (AT) could be successfully applied.
- Identify the key features of a region that must be considered for successful application of AT.
- Demonstrate knowledge of the birth and evolution of the AT movement.
- Summarize the key aspects of AT projects that are successful.
- Summarize the key features of AT projects that have failed (better named Inappropriate Technology).
- Explain how the engineering design process should accommodate AT principles/projects.
- Demonstrate understanding of the unique role of women in supporting successful AT projects.
- Describe promising/successful AT approaches in the areas of water, sanitation, transportation, agriculture, health, construction and energy.
- Illustrate how social media and web interconnectivity can influence AT success.
- Reflect on how your understanding of AT evolved via the research undertaken during the course.

**General Learning Objectives**

E=Evaluate, T=Teach, I=Introduce (*Beginner or Intermediate or Advanced Level*)

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**Evaluation:**

The final course mark will be determined as follows:

Reflection Papers 10%
Class Contributions 15%
Team Debate 5%
Individual Project 5%
Group Project 15%
Final Exam: 50%

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Total 100%
Note: (a) Students must pass the final examination to pass this course. Students who fail the final examination will be assigned the aggregate mark, as determined above, or 48%, whichever is less.

(b) Students must turn in all assignments and achieve a passing grade in this component, to pass this course. Students who do not satisfy this requirement will be assigned 48% or the aggregate mark, whichever is less.

(c) Students who have failed this course previously must repeat all components of the course. No special permissions will be granted enabling a student to retain assignment or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted.

(d) Should any of the classes conflict with a religious holiday that a student wishes to observe, the student must inform the instructor of the conflict no later than two weeks before the scheduled class. (For further information on Accommodations for Religious Holidays see http://www.uwo.ca/univsec/handbook/appeals/accommodation_religious.pdf)

1. Examinations
The final examination will be Open Book. Nonprogrammable calculators are allowed but no communication devices (e.g., laptop, cell phone, IPAD, etc) are allowed.

2. Assignments
Reflection Papers
A reflection paper is due at 10am before the Thursday lecture during which the weekly readings will be discussed. The objectives of these papers are to:
1. help facilitators guide class discussion,
2. develop your writing and analysis skills, and
3. ensure good preparedness for class.

Your paper needs to cover only two topics. First, you should start with how the week’s reading sheds light on the theory or application of appropriate technology. Second, you should offer your ‘reflections’ on any part of the readings. What excited you? What did not resonate? What confused you? Did it evoke other musings, learnings or experiences? I encourage you to be thoughtful and provocative and flex your creative writing skills.

Reflection papers will fail if:
1. they are late or missing;
2. they do not demonstrate that you completed the readings;
3. they show a lack of insight into the readings, or are poorly written.

Even if you have to miss a class, you will be required to submit a reflection paper.

The reflection paper cannot exceed one page, single spaced, 12 point, Times New Roman, 1 inch margins. It is very important to stay in these constraints. Please ensure your name appears on the
upper right hand side of the paper (ideally as a header). Submit the reflection papers through OWL via the TURNITIN facility.

Each week in class the reading assignment for the next week will be identified and the reflection paper from the previous week will be returned. A reflection paper will not be due in weeks when there is a different deliverable due (e.g., project). This will be made clear in class and on the course website. Unless otherwise specified, a reflection paper is due each week.

*Class Contributions*
As this is a seminar type course, you are expected to contribute to the collective learning of the class. In order to do so, you must prepare the readings carefully. During class, you must listen actively to the class conversation, ask questions of your classmates, offer insights, and contribute meaningfully. It also means that you are respectful of your classmates and their opinions, are punctual to class, and do not engage in negative or disruptive behaviours.

It is important to discriminate between class participation and contribution. Class participation focuses on you, whereas class contributions focus on the benefits you accrue to the class. You must engage with the class process in order to contribute to the collective learning of the class. Each student is expected to participate and contribute each week.

*Debates*
Team debates will be held in Weeks 7-9. You will be assigned to a team and will be provided an argument to debate. Further details will be provided in class.

*3. Projects*
There will be one individual project: a design exercise for a given problem. This will be handed out in Week 2 and due in Week 5.

There will be one group project. This will be handed out in Week 6 and due in Week 13. Further details will be provided in class.

*4. Use of English*
In accordance with Senate and Faculty Policy, students may be penalised up to 10% of the marks on all assignments, tests, and examinations for the improper use of English. Additionally, poorly written work with the exception of the final examination may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.

*Plagiarism:*
Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).
Plagiarism Checking:
The University of Western Ontario uses software for plagiarism checking. Students are required to submit their work in electronic form to Turnitin.com for plagiarism checking (accessible through the course website).

Cheating:
University policy states that cheating is a scholastic offence. The commission of a scholastic offence is attended by academic penalties that might include expulsion from the program. If you are caught cheating, there will be no second warning.

For more information on scholastic offenses, please see:
http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf

Attendance:
Any student who, in the opinion of the instructor, is absent too frequently from class, laboratory, or tutorial periods will be reported to the Dean (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean, the student will be debarred from taking the regular final examination in the course.

Accessibility:
Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Conduct:
Students are expected to arrive at lectures on time, and to conduct themselves during class in a professional and respectful manner that is not disruptive to others. Late comers may be asked to wait outside the classroom until being invited in by the Instructor. Please turn off your cell phone before coming to a class, tutorial, quiz or exam.

On the premises of the University or at a University-sponsored program, students must abide by the Student Code of Conduct: http://www.uwo.ca/univsec/board/code.pdf

Sickness and Other Problems:
Students should immediately consult with the Instructor or Department Chair if they have any problems that could affect their performance in the course. Where appropriate, the problems should be documented (see attached). The student should seek advice from the Instructor or Department Chair regarding how best to deal with the problem. Failure to notify the Instructor or Department Chair immediately (or as soon as possible thereafter) will have a negative effect on any appeal.
For more information concerning medical accommodations, please see:
http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf

Notice:
Students are responsible for regularly checking their email, course website (https://owl.uwo.ca) and notices posted outside the Civil and Environmental Engineering Department Office

Consultation:
Students are encouraged to discuss problems with their teaching assistant and/or instructor in tutorial sessions. Office hours will be arranged for the students to see the instructor and teaching assistants. Other individual consultation can be arranged by appointment with the appropriate instructor.

Course breakdown:
Engineering Science = 45% = 22.68 AUs
Engineering Design = 30% = 15.12 AUs
Complementary Studies = 25% = 12.6 AUs

The document “INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS OR EXAMINATIONS OR SUBMIT ASSIGNMENTS AS SCHEDULED” is part of this course outline.
INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS OR EXAMINATIONS OR SUBMIT ASSIGNMENTS AS SCHEDULED

If, on medical or compassionate grounds, you are unable to write term tests or final examinations or complete course work by the due date, you should follow the instructions listed below. You should understand that academic relief will not be granted automatically on request. You must demonstrate to your department (or the Undergraduate Services Office) that there are compelling medical or compassionate grounds that can be documented before academic relief will be considered. Different regulations apply to term tests, final examinations and late assignments. Please read the instructions carefully.

NEW: Requests for Academic Consideration using the Self-Reported Absence Form

If you experience an unexpected illness or injury or an extenuating circumstance (48 hours or less) that is sufficiently severe to temporarily render you unable to meet academic requirements (e.g., attending lectures or labs, writing tests or midterm exams, completing and submitting assignments, participating in presentations) you should self-declare using the online Self-Reported Absence portal. This option should be used in situations where you expect to resume academic responsibilities within 48 hours or less.

Each student will be allowed a maximum of two self-reported absences between September and April and one self-reported absence between May and August. Self-reporting may not be used for final exams or assessments (e.g. midterm exams, tests, reports, presentations, or essays) worth more than 30% of any given course.

For full instructions about the Self-Reporting System refer to the Academic Calendar link here.

A. GENERAL REGULATIONS & PROCEDURES (other than self-reported absences)

1. All first year students will report to the Undergraduate Services Office, SEB 2097, for all instances.

2. If you are an upper year student and you are missing a test/assignment/lab or examination that is worth LESS THAN 10% of your mark, you should report to your department office to request relief. If your course work is worth MORE THAN 10% of your final grade, you will report to the Undergraduate Services Office, SEB 2097.

3. Check the course outline to see if the instructor has a policy for missed tests, examinations, late assignments or attendance.

4. Documentation must be provided as soon as possible. If no one is available in your department office or the Undergraduate Services Office, leave a message clearly stating your name & student number and reason for your call. The department telephone numbers are given at the end of these instructions.

5. If you decide to write a test or an examination you should be prepared to accept the mark you earn. Rewriting tests or examinations or having the value of a test or examination reweighted on a retroactive basis is not permitted.

B. TERM/MIDTERM TESTS (other than self-reported absences)

1. If you are in first year and you are unable to write a midterm/term test, contact the Undergraduate Services Office, SEB 2097 PRIOR to the scheduled date of the test.

2. If you are an upper year student and you are unable to write a midterm/term test, inform your instructor PRIOR to the scheduled date of the test. If the instructor is not available, leave a message for him/her at the department office. If the test is worth LESS THAN 10% of your mark, you should report to your department office to request relief. If the test is worth MORE THAN 10% of your final grade you will report to the Undergraduate Services Office, SEB 2097 to request relief.

3. Be prepared to provide supporting documentation to the Department Chair and/or the Undergraduate Services Office (see next page for information on documentation).

4. Discuss with the instructor if and when the test can be rescheduled. N.B. The approval of the Chair or the Undergraduate Services Office is required when rescheduling midterm/term tests.
C. **FINAL EXAMINATIONS (cannot be self-reported)**

1. If you are unable to write a final examination, contact the Undergraduate Services Office PRIOR TO THE SCHEDULED EXAMINATION TIME to request permission to write a Special Final Examination. If no one is available in the Undergraduate Services Office, leave a message clearly stating your name & student number.

2. Be prepared to provide the Undergraduate Services Office with supporting documentation (see next page for information on documentation) the next day, or as soon as possible (in cases where students are hospitalized). The following circumstances are not considered grounds for missing a final examination or requesting special examinations: common cold, headache, sleeping in, misreading timetable and travel arrangements.

3. In order to receive permission to write a Special Examination, you must obtain the approval of the Chair of the Department and the Associate Dean and in order to apply you must sign a "Recommendation for a Special Examination Form" available in the Undergraduate Services Office. The Undergraduate Services Office will then notify the course instructor(s) and reschedule the examination on your behalf.

   **PLEASE NOTE:** It is the student’s responsibility to check the date, time and location of the Special Examination.

D. **LATE ASSIGNMENTS**

1. Advise the instructor if you are having problems completing the assignment on time (prior to the due date of the assignment).

2. Be prepared to provide documentation if requested by the instructor (see reverse side for information on documentation).

3. If you are granted an extension, establish a due date. The approval of the Chair of your Department (or the Assistant Dean, First Year Studies, if you are in first year) is not required if assignments will be completed prior to the last day of classes.

4. i) Extensions beyond the end of classes must have the consent of the instructor, the department Chair and the Associate Dean, Undergraduate Studies. Documentation is mandatory.

   ii) A Recommendation of Incomplete Form must be filled out indicating the work to be completed and the date by which it is due. This form must be signed by the student, the instructor, the department Chair and the Associate Dean, Undergraduate Studies.

E. **SHORT ABSENCES**

If you miss a class due to a minor illness or other problem, check your course outlines for information regarding attendance requirements and make sure you are not missing a test, laboratory or assignment. Cover any readings and arrange to borrow notes from a classmate.

F. **EXTENDED ABSENCES**

If you are absent more than one week or if you get too far behind to catch up, you should consider reducing your workload by dropping one or more courses. (Note drop deadlines listed below). You are strongly encouraged to seek advice from your Academic Counsellor in the Undergraduate Services Office.

G. **DOCUMENTATION**

If you consulted an off-campus doctor or Student Health Services regarding your illness or personal problem, you must provide the doctor with a Student Medical Certificate to complete at the time of your visit and then bring it to the Department (or the Undergraduate Services Office). **This note must contain the following information:** severity of illness, effect on academic studies and duration of absence. Regular doctor’s notes will not be accepted; only the Student Medical Certificate will be accepted.

   **In Case of Serious Illness of a Family Member:** Provide a Student Medical Certificate to your family member’s physician to complete and bring it to the Department (or the Undergraduate Services Office if you are in first year).

   **In Case of a Death:** Obtain a copy of the death certificate or the notice provided by the funeral director's office. You must include your relationship to the deceased and bring it to the Department (or the Undergraduate Services Office if you are in first year).

   **For Other Extenuating Circumstances:** If you are not sure what documentation to provide, ask the Departmental Office (or the Undergraduate Services Office if you are in first year) for direction.

   **Note:** Forged notes and certificates will be dealt with severely. To submit a forged document is a scholastic offence (see below).
H. ACADEMIC CONCERNS

1. You need to know if your instructors have a policy on late penalties, missed tests, etc. This information may be included on the course outlines. If not, ask your instructor(s).

2. You should also be aware of attendance requirements in some courses. You can be debarred from writing the final examination if your attendance is not satisfactory.

3. If you are in academic difficulty, check out the minimum requirements for progression in the calendar. If in doubt, see your Academic Counsellor.

Calendar References: Check these regulations in your 2019 Western Academic Calendar available at www.westerncalendar.uwo.ca.

Self-Reporting Absences
Absences Due to Illness
Academic Accommodations for Students with Disabilities
Academic Accommodations for Religious or Holy Days
Course Withdrawals
Examinations
Scheduling of Term Assignments
Scholastic Offences
Student Medical Certificate
Engineering Academic Regulations

Note: These instructions apply to all students registered in the Faculty of Engineering regardless of whether the courses are offered by the Faculty of Engineering or other faculties in the University.

Add Deadlines:

- First term half course (i.e. “A” or “F”) September 13, 2019
- Full courses and full-year half course (i.e. “E”, “Y” or no suffix) September 13, 2019
- Second term half course (i.e. “B” or “G”) January 14, 2020

Drop Deadlines:

- First term half course (i.e. “A” or “F”) November 12, 2019
- Full courses and full-year half courses (i.e. “E”,”Y” or no suffix) November 30, 2019
- Second term half or second term full course (i.e. “B” or “G”) March 7, 2020

Contact Information:

Undergraduate Services Office: SEB 2097 Phone: 519-661-2130 E-mail: engugrad@uwo.ca
Chemical & Green Process Engineering: TEB 477 Phone: 519-661-2131 E-mail: cbeugrad@uwo.ca
Civil Engineering: SEB 3005 Phone: 519-661-2139 E-mail: civil@uwo.ca
Computer, Electrical, Mechatronic Systems & Software Engineering TEB 279 Phone: 519-661-3758 E-mail: eceugrad@uwo.ca
Integrated Engineering ACEB 2410 Phone: 519-661-6725 E-mail: engceli@uwo.ca
Mechanical Engineering: SEB 3002 Phone: 519-661-4122 E-mail: mmeundergraduate@uwo.ca

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