S.P.A.C.E. 365: Make Things That Matter

365-BWP-DW

Winter 2020 – Physics Department

Instructor: Joel Trudeau

Office: 7A.20

Email: jtrudeau@dawsoncollege.qc.ca

Instructor Accessibility: Office hours or by appointment through MIO/email.

COURSE DESCRIPTION

SPACE 365: Make Things That Matter is part of an integrated learning community in conjunction with SPACE (Sciences Participating with Arts and Culture in Education) at Dawson College. It embraces the notion that all problems, even the seemingly intractable ones, can be solved through human ingenuity and a collective desire to improve the lives of everyone. The course explores problem solving, innovation, and the future through the application of maker principles, design thinking, social impact tool sets and related methodologies. A sequence of design challenges and activities linked with various innovation initiatives concretize the methods. Students generate, develop and realize their own breakthrough ideas by way of learning basic skills of brainstorming, research, prototyping, and public presentations. Collaborating in groups, they may pursue any problem that aligns with the yearly theme of the course, can be related to a contemporary issue and has the potential for a synthesis of disciplines.

All project ideas are placed in an appropriate social context where students draw on different areas of knowledge in the consideration and treatment of contemporary issues from a cross-disciplinary perspective. Students are encouraged to derive inspiration and incorporate knowledge, skills and problems from their programs and other learning activities. Final projects may be presented in a variety of public venues and will be linked with annual SPACE co-curricular undertakings. The SPACE theme for 2019-2020 is *Technique.* Visit http://space.dawsoncollege.qc.ca/theme/current/technique for more information.

COURSE OBJECTIVES

By the end of this course students will be able to:

i. Identify, gather and reference credible source materials from across the disciplines critical to the research process in developing breakthrough ideas.
ii. Prepare and conduct interviews with experts and/or target audiences.
iii. Place project ideas in appropriate social context through the use of a variety of methodological lenses.
iv. Analyze potential impacts and design structures needed to support implementation through the creation and presentation of scenarios, strategies and artifacts.
v. Perform feasibility studies; utilize rapid, iterative prototyping to refine ideas; elicit feedback from multiple stakeholders and end-users.
vi. Incorporate process-oriented concepts from multiple perspectives in order to explore solutions of complex problems.

vii. Work productively in a collaborative and active learning environment.
viii. Synthesize and transfer learning to new, complex situations outside the course.

MEETING TIMES DURING THE SEMESTER

Tuesday from 15:00-18:00 in Room 3F.37

STATEMENT OF THE COMPETENCY TO BE ACQUIRED

To explore contemporary issues from a transdisciplinary perspective.

ELEMENTS OF THE COMPETENCY

1. Present a research problem.
2. Analyze the research problem.
3. Propose solutions.

PRE-REQUISITE &/or CO-REQUISITE

None. Registration preference will be given to students that have or are currently participating in S.P.A.C.E. activities.

PONDERATION

3-0-3

REQUIRED TEXT AND MATERIALS

There is no single text for this course. Required readings will be provided in class and made available online. There will be a cost for materials of approximately 100$. A detailed list of materials will be made available.

TEACHING METHODS

The course objectives will be achieved through assigned reading, written assignments, presentations workshops, fieldwork, group work and collaboration in an active learning environment. Meetings will take place in a high-tech active learning classroom promoting discussion and collaboration.

EVALUATION SCHEME

Assignments	14%
Class Presentations	10%
Quizzes	8%
Participation*	8%
Term Projects	30%
Final Report	20%
Final presentation**	10%

*Participation Requirements Include:

- Attendance to all class meetings
- Preparation for scheduled activities
- Respectful contributions to a positive learning environment
- Active participation in group collaboration and class activities

Participation grades will be deducted if students fail to comply with any of the above-mentioned points.

**Final Presentations will occur at a time and venue to be determined. This assessment may be presented as a video and include a public venue component, as all projects must link with some activity outside the course. The instructor will provide options for students to choose from for this component of the evaluation.

STANDARD OF PERFORMANCE

In order to pass the course, you must obtain a final grade of **60%** or more.

SUBMISSION OF MATERIAL FOR EVALUATION

Marks will be deducted for any work submitted late. Deductions are as follows:
- A 10% deduction when the work is not submitted to the teacher by the date due.
- An additional 10% deduction *per* day late (not including weekends).

When an assessment due date is to be missed due to a valid absence that is known ahead of time, it is the student's responsibility to submit the work **before** the due date in order to avoid these deductions. Late work may also avoid penalty at the discretion of the instructor for special circumstances when students are justifiably unable to submit work before or on the due date.

THE INSTITUTIONAL STUDENT EVALUATION POLICY (ISEP)

ISEP is designed to promote equitable and effective evaluation of student learning and is therefore a crucial policy to read and understand. The policy describes the rights and obligations of students, faculty, departments, programs, and the College administration with regard to evaluation in all your courses, including grade reviews and resolution of academic grievance. The ISEP is available on the Dawson website.

ATTENDANCE AND COURSE PARTICIPATION REQUIREMENTS

Students should refer to the Institutional Student Evaluation Policy (ISEP section III-C) regarding attendance.

Participation and collaboration with other students are significant components of this course, so attendance will be required for evaluation. If a class activity is missed without a valid reason (e.g. illness with medical note, Religious Holiday) marks will be deducted from the participation portion of the course. Students with valid reasons may be required to do individual make-up assessments.

Students are required to participate in all activities and to follow college guidelines for any course-related off-campus activities. The relevant guidelines will be communicated to students. Anyone who does not follow the guidelines will be dismissed from the activity.

ACADEMIC INTEGRITY

The College policy on academic behaviour will be followed. Students are expected to contribute positively to the learning environment for all course activities. Please be considerate to your instructors and classmates. You are responsible for reading and understanding student responsibilities – these can be found in ISEP (appendix 1).

Cheating and plagiarism are serious academic offences. Action in response to an incident of cheating or plagiarism, up to and including the failure of a student in the course, is within the jurisdiction of the teacher, in accordance with ISEP. A grade of zero will be given to the piece of work associated with the first instance of cheating. The second instance of cheating will result in failure in the course and possible expulsion from the College.

According to ISEP, the teacher is required to report to the Sector Dean all cases of cheating and plagiarism affecting a student's grade (see ISEP section IV-C.).

INTENSIVE COURSE CONFLICTS STATEMENT

It is your responsibility to inform yourself of the dates of any intensive courses (e.g. Physical Education intensive) for which you are registered at the beginning of the semester and to plan your study periods accordingly. **You must inform your teacher of these dates within the first 2 weeks of school.** Note that

assessment dates will not be changed to accommodate Physical Education intensives. If an assignment is due while you will away from school, it is your responsibility to hand in the assignment **before** the due date, not after (or the late penalties will apply).

POLICY ON RELIGIOUS OBSERVANCE

Students who intend to observe religious holidays must inform their teachers in writing as prescribed in the ISEP Policy on Religious Observance. (ISEP Section III-D).

If you wish to observe religious holidays, you must inform your teacher within the first 2 weeks of school.

COURSE CONTENT

Design thinking is a human-centered, collaborative approach to problem solving and innovation that can be applied across disciplines. In this course, it is the primary methodology that supports the objective of creating an integrative learning experience for students and provides the framework for implementing the achievement context of the course competency.

Tentative breakdown of the 15 week course:

Three phases of the course correspond to the course competency elements. **Note:** There is overlap in the timeframe of elements **2.** and **3.** below. The methodologies of the course have nonlinear features so elements of the competency can be revisited and learning deepened. Element **1.**, may also be revisited if needed.

1. Weeks 1-4 (Present a research problem.):

In this element of the competency, students are exposed to the course methods, brainstorm and elaborate on initial breakthrough ideas. The design and presentation of a simple object (*e.g.*, making of a notebook/journal), an exercise in science fiction prototyping and other group activities concretize the course methods and model the learning outcomes.

Teams are built around common interests and complementary skillsets. Problem statements are formulated, critically examined, collectively refined and finalized as term projects.

2. Weeks 5-12 (Analyze the research problem.):

Students and teams conduct background research in the relevant disciplines. Interviews of experts and/or target audiences in the field may be prepared and carried out to elicit feedback. Feasibility studies are performed using the data and knowledge gathered. Multiple solutions involving multiple perspectives and modes of inquiry to the proposed research problem are considered. Written reflections journal the evolution of the breakthrough ideas, individual learning, and team dynamics throughout the process.

Prototyping and feedback cycles continue as groups present strategies, models and refinements of projects. Venues for presentation of projects are decided.

3. Weeks 7-15 (Propose solutions.):

Term projects may be presented in a variety of mediums. *E.g.,* audio-visual, constructed objects, or any format verified by the instructor. Peer and self-assessments, along with instructor feedback of final group presentations are taken into account for any refinements needed before group or individual public venue presentations are made. (The public venue component has a number of options including the SPACE website, annual exhibition and other related co-curricular activities such as the ScienceFest student-centered conference. Options are to be discussed and confirmed with instructor.)

Students prepare a final report drawing from the term reflections and other course materials that motivate the choice of research problem, justify the proposed solution(s) identify the main contributions of the disciplines and team members involved, and indicate future directions that can be pursued.