COURSE OUTLINE	
TERM: FALL 2022	COURSE NO: APSC 112
INSTRUCTOR:	COURSE TITLE: RAPID PROTOTYPING TECHNOLOGY
OFFICE: LOCAL: E-MAIL:	SECTION NO(S):	CREDITS: 1.0
OFFICE HOURS:	
COURSE WEBSITE:	

*Capilano University acknowledges with respect the Lil'wat, Musqueam, Squamish, Sechelt,
and Tsleil-Waututh people on whose territories our campuses are located.*

COURSE FORMAT
One hour of class time for a 15-week semester, which includes two weeks for final exams.

COURSE PREREQUISITES
Pre-calculus 12 or BMTH 054 or MATH 105 or Calculus MPT

CALENDAR DESCRIPTION
In this exploratory course, leading to a micro-credential, students will be introduced to modern rapid prototyping technology used for engineering design and manufacturing. Students will learn about many new rapid prototyping technologies, such as 3D printers, casting techniques, laser cutters, computer controlled milling machines, and electronic circuit board technology. Case studies and sample problems will be used to elucidate these principles and conventions. Factors affecting the cost of using these technologies will be discussed.

COURSE NOTE
APSC 112 is an approved Science course.
APSC 112 is an approved Quantitative/Analytical course for baccalaureate degrees.

This course is not intended for students in the Engineering programs. Students who receive credit for APSC 130 or APSC 140 cannot receive credit for APSC 112.

REQUIRED TEXTS AND TECHNOLOGY
Required Texts
None

Required Technology
To participate in this course, you will need to have access to a device (laptop or computer) and WIFI.

COURSE STUDENT LEARNING OUTCOMES
On successful completion of this micro-credential course, students will be able to do the following:
- Demonstrate an introductory knowledge of Rapid prototyping technology,
- Demonstrate knowledge of the proper use of various manufacturing tools
- Demonstrate knowledge of various applications of Rapid Prototyping technology

COURSE CONTENT
The following topics will be covered in the course, not necessarily in the listed order:

Topics	Hours (approx.)
Introduction to Rapid Prototyping (RP) Technology	2.0
Fundamentals of 3D Printing Technology	3.0
Fundamentals of Numerically Controlled Milling Machine Technology	2.0
Fundamental of Casting Technology	1.0
Fundamentals of Laser Cutting Technology	2.0
Fundamentals of Electronic Circuit Board Layout and Prototyping Techniques	2.0
Other RP Equipment and Uses	3.0
Total	15.0

LECTURES
The lectures will illustrate and discuss principles of Modern Rapid Prototyping Technology used in Engineering. Students will research a given RP technology and discuss a design concept utilizing the technology, including discussion of materials, strength, cost, repeatability, reliability, durability, and sustainability. Students will produce an oral presentation explaining their investigation of a specific RP techniques.

EQUIPMENT ACCESS
Drop-in access to the University equipment is available during the hours posted outside each lab, subject to equipment availability. Please respect the directions of the instructor in the lab if asked to leave the lab due to a class booking.

EVALUATION PROFILE
Final grades for the course will be computed based on the following schedule:

Class Participation	10%
Quizzes	10%
Report	25%
Final Presentation	25%

Final Exam	30%
TOTAL	100%

Participation grades are based on the consistency, quality, and frequency of contributions to class discussions and in-class group activities. A detailed rubric will be provided by the instructor.

GRADING PROFILE
Letter grades will be assigned according to the following guidelines:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D = 50-59
A = 85-89	B = 73-76	C = 63-66	F = 0-49
A- = 80-84	B- = 70-72	C- = 60-62	

Students should refer to the University Calendar for the effect of the above grades on grade point average.

LATE ASSIGNMENTS
Late assignments will receive a late penalty of 10% per day.

INCOMPLETE GRADES
Grades of Incomplete "I" are assigned only in exceptional circumstances when a student requests extra time to complete their coursework. Such agreements are made only at the request of the student, who is responsible to determine from the instructor the outstanding requirements of the course.

MISSED EXAMS/QUIZZES/LABS
Normally, a score of zero will be given for a missed exam, test, quiz, lab, etc. In some exceptional situations, the student will be permitted to write a make-up test, defer the lab to a later date or to replace the score by other marks.

The situations in which a score of zero may be avoided are those for which the student meets all of the following conditions:

1. Circumstances are beyond the control of the student which resulted in the exam, test, quiz, lab, etc. to be missed. Such circumstances include serious illness or injury, or death of close family member. They do not include forgetting about the test, lack of preparation for the test, work-related or social obligations.

2. The student has notified the instructor (or the School of STEM office staff, if the instructor is not available) about the missed exam, test, quiz, lab, etc. Such notification must occur in advance, if possible, or at the latest, on the day of the exam, test, quiz, lab, etc.

3. Proof of the circumstances must be provided. Proof of illness or injury may require a note from a doctor, who may also be consulted.

4. The student has been fully participating in the course up until the circumstances that prevented the writing of the exam, test, quiz, lab, etc. Fully participating means attending almost all classes and turning in almost all assignments in the course.

The options offered to the student who meets the four conditions are decided by the instructor. They will not necessarily meet the convenience of the student.

ATTENDANCE
Attendance at lectures, labs and tutorials is expected. You are responsible for all information given in the lectures, labs and tutorials, including the times of tests and deadlines for assignments.

ENGLISH USAGE
Students are expected to use correct standard English in their written and oral assignments, exams, presentations, and discussions. Failure to do so may result in reduced grades in any part of the Evaluation Profile. Please refer to the guidelines provided in the Capilano Guide to Writing Assignments (available from the University Bookstore).

COMMUNICATION, ONLINE BEHAVIOUR AND EXPECTATIONS

Communication: Please be sure to check your official Capilano University email and the course eLearn site regularly. All official communication will be either sent via this email address or posted on the eLearn site.

Online Expectations
To ensure a positive and productive learning environment during any on-line live synchronous sessions, it is important that all students adhere to the following behavioral expectations.
- Remember the human – this is the Golden Rule of internet communications. Always be aware that you are talking to a person, not a device. Therefore, the same rules of courtesy apply.
- Adhere to the same standards of behaviour online that you follow in real life
- Know where you are in cyberspace – netiquette varies from domain to domain. What is acceptable in a chat room may not be appropriate in a professional forum.
- Respect other people's time and bandwidth
- Make yourself look good online – spelling and grammar count! Always write thoughtful posts and keep your language clean.
- Respect other people's privacy (recording or screen shots without permission are not appropriate)
- Be forgiving of other people's mistakes (Source: Virginia Shea)

In this course, we are a creating a safe and respective online community that allows for diverse ideas, perspectives, and identities to be shared and valued. The policies governing student conduct remain the same in an online and remote learning environments. Expectations regarding behaviour include:
- Keeping an open-mind and be willing to listen to the ideas of others
- Participating in but not dominating discussions
- Listening and giving other students the opportunity to participate
- Muting your microphone when not speaking on Zoom calls
- Using the raise your hand function when on Zoom

What you can expect from me:
- Respond to emails
- Start and end class on time
- To be available during student coaching hours to support your learning
- To be responsive to your feedback about the course

What I can expect from you:
- Attend both in person and live online sessions on time
- To be attentive and engaged during both in person and online class sessions
- To come prepared for class discussions
- Interact respectfully with peers
- To mute your microphone when not speaking
- To ask questions and seek help when appropriate

Class Recordings
This course or portions of this class may be recorded by the instructor for educational purposes. These recordings will be shared only with students enrolled in the course. This is intended to supplement the course experiences.

Privacy
Consult the University's Privacy Office for information regarding privacy concerns.

INCLUSIVITY
In this course you will be treated with respect. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this course are expected to contribute to a respectful, welcoming, and inclusive environment for learning.

VIRTUAL STUDENT SUPPORT RESOURCES

Please refer to the Capilano Website for Remote Learning Support to help you succeed this semester. Services include online academic support such as Advising, the Writing Centre and the Library. A central navigation point for all services can be found at: https://www.capilanou.ca/student-life/

Digital Student Ambassadors
The Digital Student Ambassadors are students as Capilano who offer peer support navigating the online learning environment or peer support with the educational technology tools such as (eLearn, MS Teams/Zoom/WebEx) please contact Digital Student Ambassadors through MS Teams Monday through Saturday at Student Online Learning or email them at dsa@capilanou.ca

UNIVERSITY OPERATIONAL DETAILS

Tools for Success

Many services are available to support student success for Capilano University students. A central navigation point for all services can be found at: https://www.capilanou.ca/student-life/

Capilano University Security: download the CapU Mobile Safety App

Policy Statement (S2009-06)
Capilano University has policies on Academic Appeals (including appeal of final grade), Student Conduct, Academic Integrity, Academic Probation and other educational issues. These and other policies are available on the University website.

Academic Integrity (S2017-05)

Any instance of academic dishonesty or breach of the standards of academic integrity is serious and students will be held accountable for their actions, whether acting alone or in a group. See policy and procedures S2017-05 Academic Integrity for more information: https://www.capilanou.ca/about-capu/governance/policies/

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Integrity Procedures.

Academic dishonesty is any act that breaches one or more of the principles of academic integrity. Acts of academic dishonesty may include but are not limited to the following types:

Cheating: Using or providing unauthorized aids, assistance or materials while preparing or completing assessments, or when completing practical work (in clinical, practicum, or lab settings), including but not limited to the following:
- Copying or attempting to copy the work of another during an assessment;
- Communicating work to another student during an examination;
- Using unauthorized aids, notes, or electronic devices or means during an examination;
- Unauthorized possession of an assessment or answer key; and/or,
- Submitting of a substantially similar assessment by two or more students, except in the case where such submission is specifically authorized by the instructor.

Fraud: Creation or use of falsified documents.

Misuse or misrepresentation of sources: Presenting source material in such a way as to distort its original purpose or implication(s); misattributing words, ideas, etc. to someone other than the original source; misrepresenting or manipulating research findings or data; and/or suppressing aspects of findings or data in order to present conclusions in a light other than the research, taken as a whole, would support.

Plagiarism: Presenting or submitting, as one's own work, the research, words, ideas, artistic imagery, arguments, calculations, illustrations, or diagrams of another person or persons without explicit or accurate citation or credit.

Self-Plagiarism: Submitting one's own work for credit in more than one course without the permission of the instructors, or re-submitting work, in whole or in part, for which credit has already been granted without permission of the instructors.

Prohibited Conduct: The following are examples of other conduct specifically prohibited:
- Taking unauthorized possession of the work of another student (for example, intercepting and removing such work from a photocopier or printer, or collecting the graded work of another student from a stack of papers);
- Falsifying one's own and/or other students' attendance in a course;
- Impersonating or allowing the impersonation of an individual;
- Modifying a graded assessment then submitting it for re-grading; or,
- Assisting or attempting to assist another person to commit any breach of academic integrity.

Sexual Violence and Misconduct
All Members of the University Community have the right to work, teach and study in an environment that is free from all forms of sexual violence and misconduct. Policy B401 defines sexual assault as follows:

> Sexual assault is any form of sexual contact that occurs without ongoing and freely given consent, including the threat of sexual contact without consent. Sexual assault can be committed by a stranger, someone known to the survivor or an intimate partner.

Safety and security at the University are a priority and any form of sexual violence and misconduct will not be tolerated or condoned. The University expects all Students and Members of the University Community to abide by all laws and University policies, including B.401 Sexual Violence and Misconduct Policy and B.401.1 Sexual Violence and Misconduct Procedure (found on Policy page https://www.capilanou.ca/about-capu/governance/policies/)

Emergencies: Students are expected to familiarise themselves with the emergency policies where appropriate and the emergency procedures posted on the wall of the classroom.