**COSC 221** **-** **101**

**Introduction to Discrete Structures (3)**

**2021 Summer Term 1**

**Meeting Schedule:** Zoom 12pm – 2.30pm on Fridays

**Instructor:**

Name: Jeewon Yoo

Office: SCI 393

E-mail: [jeewon.yoo@ubc.ca](mailto:jeewon.yoo@ubc.ca)

**Office Hours:** MON 16:00 – 17:30 or By Email

**Course Description:**

**COSC 221 (3) Introduction to Discrete Structures**

Introduction to sets, logic, combinatorics, and graph theory, as applied in computing: sets and propositions, permutations and combinations, graphs and trees, Boolean algebra, algorithms, and applications. [3-1-0] *Prerequisite:* One of MATH 101, MATH 142, APSC 172.

*Corequisite:* COSC 121

**Course Format:**

The course will be delivered online through our Canvas learning management system. Each week, students should study from recorded videos, taking notes, and complete weekly assignment. Live review sessions are scheduled every Friday in class. All live activities will be recorded and uploaded on Canvas.

**Learning Outcomes**: After completing this course, students will be able to:

* understand the fundamental concepts of discrete mathematics;
* learn the important techniques for computing sets, propositions, permutations and combinations;
* practice building basic tools in cryptography.

Information and support: <http://ctl-ok.sites.olt.ubc.ca/files/2016/10/learning_outcomes.pdf>

**Important Dates:**

Monday, 10 May 2021: First day of classes for term 1 running from May 10 to Jun 17.  
Friday, 14 May 2021: Last day to withdraw without a W standing.  
Monday, 24 May 2021: Victoria Day. University closed.  
Friday, 11 June 2021: Last day to withdraw with a W standing.  
Thursday, 17 June 2021: Last day of classes for most faculties.  
Monday, 21 June 2021: Start of Final Examination Period  
Friday, 25 June 2021: Last day of Final Examination Period

**Passing Criteria:** Failure to write the final exam at the scheduled time **OR** failure to attain the combined midterms and the final exam mark of at least 40%, may result in a failing grade for the course.

**Required Materials:**

E-Book & WebAssn (Required):

S. Epp, ***Access Code: WebAssn for Discrete Mathematics with Applications (5th ed)***, Brooks & Cole. (ISBN: 9780357035245)

This is included as an e-book with your WebAssn access code. WebAssn practice questions are not for marks.

Login Page: <https://www.webassign.net/wa-auth/login>

\*Login Username: [studentID@ubc.ca](mailto:studentID@ubc.ca) (For example: [12345678@ubc.ca](mailto:12345678@ubc.ca))

\*Login Password: **Password1**

Must have a computer with speaker, microphone, camera, internet connectivity, and google chrome (if possible) installed. A secondary device (such as smartphones, tablets, etc) with speaker, camera, microphone, and WIFI connectivity. Reliable internet access for your computer and the secondary device.

**Course Evaluation:**

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| --- | --- |
| Note Taking | 5% |
| Written Assignments **(Due Tuesdays Each Week)** | 20% |
| Midterm **(Tuesday, June 1st at 12pm In Class)** | 25% |
| Project Assignment | 10% |
| Final Exam (**Cumulative**) | 40% |

**Written Assignments & Written Lecture Notes**There are five written assignments and written lecture notes due 11:59pm on Tuesdays. It is your responsibility to check the due dates and submit assignments and notes on time (Due dates for both are always the same: Tuesdays 11:59pm.) Once you submit your work on Canvas, **make sure to go back** to the submission box on Canvas and check that your submission is uploaded properly and confirm no missing pages. Submissions after the due date will not be counted. Try to submit your work at least 12 hours before the due date. **Remember:** Always start the assigned work early. Do not leave things until the last minute. I will be available for help during my office hours or by emails. **No late submissions will be accepted. No extensions or make up assignments.** The lowest written assignment and written notes score may be dropped. If an assignment/notes is missed due to special circumstances submit formal documents, the final exam will be weighted more heavily to compensate upon approval. Travel or workload (due to other courses or etc) are not acceptable excuses.

**Note Taking Guidelines**

There are five written notes to submit as mentioned. We learn math by thinking, questioning, and writing. For each video (lectures) copy everything on your written notes neatly and efficiently. Note Taking Guidelines and Late Submission Policy:

1. On top of every page, write the title of each lecture video or practice question number with your full name.
2. Copy everything on your written notes neatly and efficiently.
3. Scan all your work and merge all your photos in a single pdf file using an app called “CamScanner” or a similar free app. Here are some instructions about this.  
   <https://www.instructables.com/id/Welcome-to-CamScanner-Splash-Page/>
4. Submit your written notes by 11:59pm on Tuesdays.

**Midterm Exam:** There will be one midterm exam this semester. The date and time for the midterm exam will be provided through Canvas or see the evaluation table above. It is your responsibility to take the test on time. No make up tests. If a test is missed due to special circumstances submit formal documents, the final exam will be weighted more heavily to compensate if approved. Travel or workload (due to other courses or etc) are not acceptable excuses.

**Final Exam:** There is a **2.5hrs - 3hrs comprehensive final exam** during the final examination period from June 21 to 25. This is a cumulative final exam. It is your responsibility to take the test on time. No make up tests.

Failure to write the final exam at the scheduled time **OR** failure to attain the combined midterms and the final exam mark of at least 40%, may result in a failing grade for the course.

Note: Any requests for changes to final exams must be sent to the office of the Associate Dean of Students ([fos.students.ubco@ubc.ca](mailto:fos.students.ubco@ubc.ca)).

**Missed Assignments and Exams (if applicable)** From UBC Okanagan Academic Calendar/Policies and Regulations/Academic Concession

“Students who, because of unforeseen events, are absent during the term and are unable to complete tests or other graded work, should normally discuss with their instructors how they can make up for missed work, according to **written guidelines given to them at the start of the course**. Instructors are not required to make allowance for any missed test or incomplete work that is not satisfactorily accounted for. If ill health is an issue, students are encouraged to seek attention from a health professional. Campus Health and Counselling will normally provide documentation only to students who have been seen previously at these offices for treatment or counselling specific to conditions associated

with their academic difficulties. Students who feel that requests for consideration have not been dealt with fairly by their instructors may take their concerns first to the Head of the discipline (Dr. Heinz Bauschke: [heinz.bauschke@ubc.ca](mailto:heinz.bauschke@ubc.ca) and Dr. John Braun: [john.braun@ubc.ca](mailto:john.braun@ubc.ca)), and if not resolved, to the Office of the Dean. Further information can be found at:

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0>.

**Seminars:** The attendance is not mandatory. (BUT! Every student must be registered in one of the seminar sections.) **To remain in this class:** you are responsible to register into a seminar section before the ADD/DROP deadline or you will receive an appropriate academic notation of a W and you will be financially responsible for up to 50% of the tuition fee when the course is dropped by Administration after the Add/Drop deadline. During the normal seminar hours, TA(s) will be holding office hours. Feel free to ask questions.

**Late Policy** See Page 2 and 3 under Written Notes / Written Assignments Description.

**IMPORTANT:** After uploading your assignments, notes, and exams on Canvas, make sure to go back to the submission boxes and check if each of your submissions is uploaded properly. Check that if all pages are submitted. Try to upload your work early so that if there is a technical issue, you have time to resolve. If you need help from IT perspective, feel free to email your instructor with full details of the issue with screenshots **before the due date**. Reporting issues after the due date is not an excuse.

**Lecture Outline** Tentative Course Schedule (Subject to change)

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| --- | --- |
| **Week 1 (May 10-14)** | Section 1.1: Variables Section 1.2: Cartesian Product  Section 2.1: Logical Form and Logical Equivalences  Section 2.2: Conditional Statements |
| **Week 2 (May 17-21)** | Section 2.3: Valid and Invalid Arguments  Section 3.1: Predicates & Quantified Statements I  Section 3.2: Predicates & Quantified Statements II Section 3.3: Statements with Multiple Quantifiers  Section 3.4: Arguments with Quantified Statements |
| **Week 3 (May 24-28)** | Section 4.1: Direct Proof and Counter Example I  Section 4.2: Direct Proof and Counter Example II  Section 4.3-4.6: Divisibility, Quotient-Remainder, Floor and Ceiling Section 4.7: Indirect Arguments |
|  | Midterm Exam on Tuesday, June 1st 12pm (90 mins) |
| **Week 4 (May 31-Jun 4)** | Section 5.1: Mathematical Induction  Section 5.2: Strong Mathematical Induction  Section 6.1-6.3: Set Theory  Section 6.4: Boolean Algebra |
| **Week 5 (Jun 7-11)** | Section 7.2 & 8.1: Relations and Functions  Section 8.2: Reflexive, Symmetric, and Transitive  Section 8.3: Equivalence Relations  Section 8.4: Modular Arithmetic and Applications to Cryptography |
| **Week 6 (Jun 14-18)** | Section 9.5: Permutations and Combinations  Section 9.6: r-Combinations with Repetition Allowed  Section 10.1: Introduction to Graph Theory  Section 10.2: Trails, Paths and Circuits  [If time permits] Section 10.5: Trees |

Final Exam (During Exam period, TBA)

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**Grievances and Complaints Procedures**

A student who has a complaint related to this course should follow the procedures summarized below:

* The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor.
* If the complaint is not resolved to the student's satisfaction, the student should go to the associate head of Mathematics Heinz Bauschke at heinz.bauschke@ubc.ca or departmental chair John Braun at SCI 388, 807-8032 or e-mail him at john.braun@ubc.ca.

**Academic Integrity**

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic

integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. **For example, incidences of plagiarism or cheating usually result in a failing grade or mark of zero on the assignment or in the course.** Careful records are kept to monitor and prevent recidivism.

A more detailed description of academic integrity, including the policies and procedures, may be found:

<http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0>

If you have any questions about how academic integrity applies to this course, please consult with your professor.

**Cooperation vs. Cheating**

Working with others on assignments is a good way to learn the material and we encourage it. However, there are limits to the degree of cooperation that we will permit. Any level of cooperation beyond what is permitted is considered cheating. When working on programming assignments, you must work only with others whose understanding of the material is approximately equal to yours. In this situation, working together to find a good approach for solving a programming problem is cooperation; listening while someone dictates a solution is cheating. You must limit collaboration to a high-level discussion of solution strategies, and stop short of actually writing down a group answer. Anything that you hand in, whether it is a written problem or a computer program, must be written by you, from scratch, in your own words. If you base your solution on any other written solution, you are cheating. If you provide your solution for others to use, you are also cheating.

**Final Examinations**

The examination period for **S2021 is June 21 – 25, 2021**.  Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 24-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member.  Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job.

Further information on **Academic Concession** can be found under **Policies and Regulation in the *Okanagan Academic Calendar***<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0>

**Grading Practices**

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record. [http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014](http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3%2C41%2C90%2C1014) If you have any questions about how academic integrity applies to this course, please consult with your professor.

**Disability Assistance**

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, visit our website for more information: <http://students.ok.ubc.ca/drc/welcome.html> or contact the DRC at: [drc.questions@ubc.ca](mailto:drc.questions@ubc.ca)

**Equity, Human Rights, Discrimination and Harassment**

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an environment that is free from human rights based discrimination and harassment. If you require assistance related to an issue of equity, discrimination or harassment, please contact the Equity Office, your administrative head of unit, and/or your unit’s equity representative.

**UBC Okanagan Equity Advisor: ph. 250-807-9291;**

**E-mail:**  [equity.ubco@ubc.ca](mailto:equity.ubco@ubc.ca) **Web:** <https://equity.ok.ubc.ca/>

**Health & Wellness**

At UBC Okanagan health services to students are provided by Health and Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact Health and Wellness for more information or to book an appointment.

**UNC 337**

Email: [*healthwellness.okanagan@ubc.ca*](mailto:healthwellness.okanagan@ubc.ca) Web: [www.students.ok.ubc.ca/health-wellness](http://www.students.ok.ubc.ca/health-wellness)

**Sexual Violence Prevention and Response Office (SVPRO)**

A safe and confidential place for UBC students, staff and faculty who have experienced sexual violence regardless of when or where it took place. Just want to talk? We are here to listen and help you explore your options. We can help you find a safe place to stay, explain your reporting options (UBC or police), accompany you to the hospital, or support you with academic accommodations. You have the right to choose what happens next. We support your decision, whatever you decide. Visit [svpro.ok.ubc.ca](https://svpro.ok.ubc.ca/) or call us at 250.807.9640

# Independent Investigations Office (IIO)

*If you or someone you know has experienced sexual assault or some other form of sexual misconduct* by a UBC community member and you want the Independent Investigations Office (IIO) at UBC to investigate, please contact the ***IIO****. Investigations are conducted in a trauma informed, confidential* and respectful manner in accordance with the principles of procedural fairness. You can report your *experience directly to the* ***IIO*** *via email:* [*director.of.investigations@ubc.ca*](mailto:director.of.investigations@ubc.ca) *or by calling 604.827.2060* or online by visiting investigationsoffice.ubc.ca

**The Hub**

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include **tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies**. For more information, please visit the Hub’s website (<https://students.ok.ubc.ca/student-learning-hub/>) or call 250-807-9185.

**SAFEWALK**

Don't want to walk alone at night? Not too sure how to get somewhere on campus?

**Call Safewalk at 250-807-8076.**

For more information: <https://security.ok.ubc.ca/safewalk/> or download the UBC SAFE – Okanagan app.