Bow Valley College

Course Outline

SODV3301

Software Development Techniques
Fall 2024 - Current

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Bow Valley College
345 6th Avenue SE
Calgary AB T2G 4V1
Attn: Copyright Officer
email: copyright@bowvalleycollege.ca

SODV3301 Software Development Techniques

COURSE DESCRIPTION

This course introduces learners to fundamental approaches to software development techniques by using algorithms, data structures and their technique to implementation. Learners will explore common technique to find the shortest path and minimal cost path traversal techniques. They will also learn a simple way to compress data and mathematical optimization techniques will reduce the computational time for the software they will built. Learners are also exposed to common technical interview questions and strategies to solve them.

REQUISITES	Complete or concurrently enroll in: • SODV3302 - Systems Development and Object-Oriented Design (3)
EQUIVALENTS	None
CREDITS	3
HOURS	45
ELIGIBLE FOR PLAR	No
ZERO TEXTBOOK COST	Yes

COURSE LEARNING OUTCOMES

Bow Valley College is committed to ensuring our graduates can demonstrate their abilities in key areas that will make them effective citizens and encourage their development as lifelong learners. In addition to the discipline-specific skills that learners acquire in their programs, the College has identified ten learning outcomes.

College-Wide Outcomes:

1. Communication
2. Thinking Skills
3. Numeracy and Financial Literacy
4. Working with Others
5. Digital Literacy
6. Positive Attitudes and Behaviours
7. Continuous Learning
8. Health and Wellness Awareness
9. Citizenship and Intercultural Competence
10. Environmental Sustainability

#	COURSE LEARNING OUTCOME(S)	COLLEGE WIDE OUTCOMES SUPPORTED
1	Analyze and determine potential methodologies to address problem types	1, 2, 4, 5
2	Apply greedy programming to solve optimization problems based upon problem characteristics	2, 4, 5
3	Apply dynamic programming to solve optimization problems based upon problem characteristics	2, 4, 5
4	Perform quick text searching operations using the tries technique	2, 4, 5
5	Optimize searches through the use of self-balancing trees	2, 4, 5
6	Compose and trial approximation algorithms to address exponential/non-polynomial problems	2, 4, 5
7	Write and optimize code	2, 4, 5

COURSE MODULES AND SCHEDULE

**Course schedule subject to change, depending on delivery mode and term of study. For exact dates, please consult the Course Offering Information in Brightspace.*

WEEK/HOURS	MODULES
Week 1	Complexity analysis and NP-Completeness
Week 2	Complexity analysis and NP-Completeness
Week 3	The greedy algorithm
Week 4	The greedy algorithm
Week 5	The greedy algorithm
Week 6	The greedy algorithm
Week 7	Dynamic programming
Week 8	Dynamic programming
Week 9	Reading Week
Week 10	Dynamic programming
Week 11	Efficient self-balancing trees, approximation algorithms, and code optimization
Week 12	Efficient self-balancing trees, approximation algorithms, and code optimization
Week 13	Efficient self-balancing trees, approximation algorithms, and code optimization
Week 14	Efficient self-balancing trees, approximation algorithms, and code optimization
Week 15	Final assignment

ASSESSMENT

COURSE LEARNING OUTCOME(S)	ASSESSMENT	WEIGHT
1, 2, 3, 4, 5	Quizzes	30%
1, 2, 3, 4, 5	Assignments (Minimum of 3)	40%
1, 2, 3, 4, 5	Learning activities	30%

Important: For details on each assignment and exam, please see the Course Offering Information.

PERFORMANCE STANDARDS

A minimum grade of D is required to pass this course. However, a program may require a higher grade in this course to progress in the program or to meet specific program completion requirements.

Please consult with the program area or contact the program chair for further details. A minimum Grade Point Average of 2.0 is required for graduation.

GRADING SCHEME

Grade	Percentage	Grade Point	Description
A+	95-100	4.0	Exceptional: superior knowledge of subject matter
A	90-94	4.0	Excellent: outstanding knowledge of subject matter
A-	85-89	3.67	
B+	80-84	3.33	
B	75-79	3.0	Very Good: knowledge of subject matter generally mastered
B-	70-74	2.67	
C+	67-69	2.33	
C	64-66	2.0	Satisfactory/Acceptable: knowledge of subject matter adequately mastered
C-	60-63	1.67	

D+	57-59	1.33	
D	50-56	1.0	Minimal Pass
F	Less than 50	0.0	Fail: an unsatisfactory performance

REQUIRED LEARNING RESOURCES

Additional learning resources may be found in the Course Offering Information or in Brightspace.

ADDITIONAL INFORMATION

Optional Resource:
Corman, T., Lieserson, C.E., Rivest,R.L. & Stein, C. (2022) *Introduction to algorithms*, (4th edition.). (The MIT Press). MIT Press. **ISBN: 9780262046305**

Additional information may be found in the Course Offering Information or in Brightspace.

ACADEMIC ACCOMMODATIONS

Learners with a disability (learning, physical, and/or mental health) may qualify for academic and exam accommodations. For more information, or to apply for accommodations, learners should make an appointment with Accessibility Services in the Learner Success Services (LSS) Department. Accessibility Services can also assist learners who may be struggling with learning but do not have a formal diagnosis. To make an appointment visit LSS on the first floor of the south campus or call 403-410-1440. It is the learner's responsibility to contact Accessibility Services and request academic accommodations. For more information, please visit our website at http://www.bowvalleycollege.ca/accessibility.

INSTITUTIONAL POLICIES

Bow Valley College is committed to the highest standards of academic integrity and honesty. Learners are urged to become familiar with and uphold the following policies: Academic Integrity (500-1-7), Learner Code of Conduct, Procedures and Guidelines (500-1-1), Learner Appeals (500-1-12), Attendance (500-1-10), Grading (500-1-6), Academic Continuance and Graduation (500-1-5), and Electronic Communications (300-2-13). Audio or video recording of lectures, labs, seminars, or any other teaching and learning environment by learners is allowed only with consent of the instructor as part of an approved accommodation plan.

Recorded material is to be used solely for personal study and is not being used or distributed without prior written consent from the instructor.

Turnitin:

Students may be required to submit their course work to Turnitin, a third-party service provider engaged by BVC. Turnitin identifies plagiarism by checking databases of electronic books and articles, archived webpages, and previously submitted student papers. Students acknowledge that any course work or essays submitted to Turnitin will be included as source documents in the Turnitin.com reference database, where it will be used solely to detect plagiarism. The terms that apply to a student's use of Turnitin are described on Turnitin.com.

Online Exam Proctoring:

Examinations for this course may require proctoring through an online proctoring service. Online proctoring enables online exam taking within a controlled and monitored environment, thereby enhancing academic integrity. Online proctoring may occur through a variety of methods, including but not limited to:

a. live online proctoring where a remote invigilator authenticates identity and observes completion of an exam using specialized software and recordings;
b. automated proctoring where the exam session is recorded and AI (artificial intelligence) analyzed;
c. browser lockdown that limits access to other applications, websites, copying, printing, screen capture and other functions; or
d. a combination of both live/automated proctoring and browser lockdown.

Course instructors will review recordings, analyses, and data obtained through online proctoring for academic integrity infractions. It is the student's responsibility to meet the technical, software, location, and identity verification requirements necessary to enable online proctoring.

Further details of these policies are available in the Academic Calendar and on the Bow Valley College website, bowvalleycollege.ca.

Learners are encouraged to keep a copy of this course outline for future reference.

Collection of Personal Information:

This course, including your image and voice, may be recorded and made available to you and other students taking the course section. By attending the class(es) online or in person, you consent to the collection of your personal information. If you do not wish to be recorded, please contact your instructor before starting the course/class to discuss alternative arrangements.

You may use the recordings only for educational purposes and you must not copy, share, or use the recordings for any other purpose without the instructor's express permission.

Your personal information is collected in accordance with section 33(c) of the Freedom of Information and Protection of Privacy Act (Alberta) to deliver academic programming, support learner flexibility, promote universal design for learning principles, and for purposes consistent with the course activities and outcomes.

If you have any questions about the collection, disclosure, use, or protection of this information, please contact the College's Access and Privacy Officer at foip@bowvalleycollege.ca.