RRC POLYTECH

Red River College Polytechnic campuses are located on the lands of Anishinaabe, Ininiwak, Anishininew, Dakota, and Dené, and the National Homeland of the Red River Métis.

Course Outline

Course Information

Course Code and Title: COMP-2045 Cloud Infrastructure

Course Section: All Sections

Department/Program: Applied Computer Education

Total Hours: 90

Credit Hours: 6

COURSE DESCRIPTION:

Organizations increasingly rely on cloud services for their operations. This course covers an overview of the architecture, implementation and delivery of cloud technologies including networks, databases, storage and compute services. Students will identify the cloud infrastructure required for specific IT services. They will also configure, deploy and maintain a cloud service as part of a comprehensive project. This course prepares students for the AWS certified Cloud Practitioner Foundational certification exam.

RECOGNITION OF PRIOR LEARNING (RPL):

Recognition of Prior Learning (RPL) refers to a set of processes that allow individuals to document, be assessed and gain recognition for their prior learning. The focus is on the learning rather than where or how the learning occurred. Knowledge, skills and abilities gained from life experiences may be formal (transfer credit), informal or non-formal. RRC Polytech evaluates and grants credit for qualifying prior learning that is equivalent to the learning outcomes for courses in a program. For more information about RPL at RRC Polytech, refer to RPL or Policy A14 – RPL.

For general information and assistance with RPL, contact RRC Polytech's RPL Advisor at 204.632.3094 or rpladvisor@rrc.ca.

ACCESSIBILITY STATEMENT:

RRC Polytech is committed to providing persons with documented disabilities fair and equal access to educational programs, services and facilities. If you are a student with a disability* and require reasonable accommodations, you must connect with Student Accessibility Services (SAS) who will assist in developing and implementing your accommodation plan. Refer to the Student Accessibility Services webpage for information about SAS locations and how to book an appointment. Students with disabilities are also encouraged to have a private discussion with their instructor(s) to facilitate greater understanding of their learning needs.

*RRC Polytech's definition of "disability" is consistent with the Manitoba Human Rights Code. In the educational setting, "disability" refers to a permanent or temporary medical, physical, sensory, mental health (e.g., anxiety, depression), learning, or neurological (e.g., ADHD, Autism Spectrum Disorder) condition that interferes with a student's ability to fully participate in their studies and/or other associated activities.

ALTERNATE FORMATS:

This content is available in alternate formats. To request, please contact accessibility@rrc.ca.

ACADEMIC INTEGRITY:

Academic Integrity means acting with the values of honesty, trust, respect, responsibility, fairness and courage in learning, teaching and research to ensure that the credentials granted by RRC Polytech accurately represent demonstrated knowledge, skills and abilities. All members of the RRC Polytech community are expected to demonstrate these values through RRC Polytech learning activities, relationships and commitments. Clear expectations will be communicated to students to promote positive academic practices in compliance with RRC Polytech's Policy A17 – Academic Integrity. Contact academicintegrity@rrc.ca for additional information.

ACADEMIC REQUISITES:

- BIT
    - COMP-3008 OO System Design
    - COMP-1295 Information systems

OR

- IT Operations
    - COMP-1310 IT Architecture and Design
    - COMP-1311 IT Foundations

COURSE DELIVERY METHODS:

Any combination of: Classroom, Blended or Online.

The following communication tools will be used in this course:

Microsoft Teams, RRC academic email accounts and LEARN will be used for all communications in this course.

Course format:

This course will use a combination of instructor led demonstrations, self guided learning and group participation. This is a competency based course. There are no tests or exams. Students will be evaluated throughout the course by demonstrating assignments to the instructor, where they'll receive meaningful feedback and the chance to improve their grades by being allowed multiple attempts as time allows. There are rubrics available for every assignment, so students know what they will be evaluated on. If an assignment has not had its final evaluation by the due date, students will receive a grade of zero on that particular assignment, unless arrangements are made with the instructor in advance.

RRC POLYTECH

EFFECTIVE DATE:

August 26, 2024

RRC POLYTECH

Instructor Information

Instructor's name: Nico Cai

Email: ncai@rrc.ca

Office phone: N/A

Office location: P414

Office hours: By appointment through online booking

Student Readiness

TECHNOLOGY AND EQUIPMENT READINESS:

Sudents will need high speed internet and a computer capable of running a standards compliant web browser. They will also need to be able to prepare documents with their choice of word processor, and record videos using free open source software that will be provided.

STUDENT COMMITMENTS AND CONTACT TIMES:

Students are expected to attend the scheduled synchronous online lectures. In addition students must attend the face to face evaluations as assignments are due. At least 4 to 6 hours per week will be required to work through the self guided materials and activities, which may be accomplished during scheduled class times. Additional time outside of the scheduled classes will be required to work on the final project and associated milestones.

COURSE RESOURCES:

AWS Academy Cloud Foundations course. Students will be invited by the instructor once the course starts.

TEXTBOOK(S):

No textbook is required.

Student Learning

LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE:

By the end of this course of study, you should be able to...

1. Define the benefits of the main cloud service categories and core services.
2. Explain the physical structure and software architecture of cloud services.
3. Select appropriate cloud services to meet business requirements.
4. Configure a scalable web application using elastic cloud resources.
5. Configure access and permissions for specific cloud services to appropriate organizational entities.
6. Configure monitoring systems to alert when cloud services require intervention.

7. Optimize cloud services to analyze usage and make suggestions for reducing billing costs.
8. Select the appropriate load balancing, replication and geographic strategies to meet service availability criteria.
9. Configure individual cloud services to meet requirements.
10. Configure groups of cloud services to work together.
11. Determine required cloud infrastructure for IT services.
12. Secure cloud resources to meet compliance requirements.
13. Deploy a fully functional cloud project to provide a production ready solution.
14. Construct comprehensive documentation to transfer knowledge.

INSTRUCTIONAL SCHEDULE, ASSESSMENTS AND DATES:

NOTE: The following dates are subject to change based on the needs of the students at the instructor's prerogative. Students will be notified ahead of time of any changes.

Module/Unit/Week or Important Event	Topic and Learning Outcome(s)	Assessment and Evaluation	Weight	Due Date
First Day of Classes				Aug. 26
Add/Drop Period				Aug. 26-30
VW Deadline for 15-Week Programs				Nov. 15
VW Deadline for 16-Week Programs				Nov. 21
Last Day of Classes for 15-Week Programs				Dec. 6
Last Day of Classes for 16-Week Programs				Dec. 13
Orientation Module 1	Cloud Concepts Overview LO1	Module 1: Knowledge Check	3	TBD
Module 2	Cloud Economics & Billing LO1	Module 2: Knowledge Check	3	TBD
Module 3	AWS Global Infrastructure Overview LO1, LO2, LO3	Module 3: Knowledge Check	3	TBD

Module 4	AWS Cloud Security LO5, LO12	Module 4: Knowledge Check Lab 1: Introduction to AWS IAM	3 3.75	TBD
Module 5	Networking & Content Delivery LO9, LO10	Module 5: Knowledge Check Lab 2: Build your VPC and Launch a Web Server	3 3.75	TBD
Project Milestone 1	VPC & Security Groups – Demonstration LO13	Project Milestone 1: VPC & Security Groups – Evaluation	1.5	TBD
Module 6	Compute LO4, LO9	Module 6: Knowledge Check Lab 3: Introduction to Amazon EC2 Activity 1: AWS Lambda Activity 2: AWS Elastic Beanstalk	3 3.75 3.75 3.75	TBD
Module 7	Storage LO3, LO9, LO10	Module 7: Knowledge Check Lab 4: Working with EBS	3 3.75	TBD
Project Milestone 2	S3 & EFS Storage – Demonstration LO13	Project Milestone 2: S3 & EFS Storage – Evaluation	1.5	TBD

Project Milestone 3 Project Milestone 4	EC2 Instance & Elastic IP – Demonstration Nextcloud – Demonstration LO13	Project Milestone 3: EC2 Instance & Elastic IP – Evaluation	1.5	TBD
Module 8	Databases LO3, LO9, LO10	Module 8: Knowledge Check Lab 5: Build a Database Server	3 3.75	TBD
Module 9	Cloud Architecture LO7, LO8, LO11	Module 9: Knowledge Check	3	TBD
Module 10	Auto Scaling & Monitoring LO4, LO6, LO8, LO9, LO10	Module 10: Knowledge Check Lab 6: Scale & Load Balance your Architecture	3 3.75	TBD
Project Milestone 4	Evaluation LO13	Project Milestone 4: Nextcloud – Evaluation	3	TBD
Final Project	Evaluation & certification resources LO13, LO14	Project: Working Solution – Evaluation Project: Documentation – Evaluation Group Participation AWS Academy Course Feedback	7.5 15 5 5	TBD
Labour Day (No Classes)				Sept. 2

National Day for Truth and Reconciliation (No Classes)	Sept. 30
Fall Break (No Classes)	Oct. 11
Thanksgiving Day (No Classes)	Oct. 14
Remembrance Day (No Classes)	Nov. 11
Knowledge Checks:	30%
Labs:	30%
Project:	30%
Participation:	10%
Assessment Total:	100%

LETTER GRADE DISTRIBUTION:

Letter	GPA	Percentage
A+	4.5	90 to 100%
A	4.0	80 to 89%
B+	3.5	75 to 79%
B	3.0	70 to 74%
C+	2.5	65 to 69%
C	2.0	60 to 64%
D	1.0	50 to 59%
F	0.0	0 - 49%

A grade of 50% is required to pass this course.

As per policy A22 students must achieve a grade of at least 50% to pass the course. Although that's the minimum required grade to pass, through face to face assessments, feedback, and multiple assignment attempts, students will be encouraged to achieve at least 80% or higher in this course to demonstrate mastery of the materials.

Course Policies

GENERAL ACADEMIC POLICIES:

It is the student's responsibility to be familiar with and adhere to the RRC Polytech Academic Policies. These Policies can be found in the RRC Polytech calendar or online under Academic Matters at rrc.ca/legal/policies.

SUPPLEMENTARY POLICIES:

As a student at Red River College Polytechnic, you have certain rights and responsibilities. As such students should be familiar with the Policies involving student matters.

S1 - Student Code of Rights and Responsibilities

S2 - Student Discipline

S3 - Student Appeals

S5 - At-Risk Students

DATE REVISED:

May 21, 2024 (Rev.4)

Additional Information/Frequently Asked Questions

Q: Will an Apple computer work for this course?

A: Yes. This course uses all web based technologies accessed through any standards compliant web browser and does not require any specific operating system.

Mental Health and Well-being at RRC Polytech

Having good personal health and well-being will support your success in this program.

WE ENCOURAGE YOU TO:

- Recognize that stress is an expected part of being a college student.
- Rethink how you view difficulty. Being challenged is actually a part of learning and reaching success.
- Reflect on your role in taking care of yourself throughout the term. Do your best to balance your schoolwork and life demands.
- Reach out to your instructor, program coordinator, or College supports at any time if something is affecting your academic performance. It's always best to reach out early and it's the responsible thing to do.

COLLEGE SUPPORTS READY AND WILLING TO ASSIST YOU:

- https://www.rrc.ca/tltc/learn/https://www.rrc.ca/its/Academic Success Centre
- Campus Well-Being
- Equity, Diversity and Inclusion Supports
- Health Services
- Indigenous Student Supports
- International Student Supports
- Library Services
- Student Accessibility Services
- Student Counselling Services
- United Way 211 community resource

AUTHORIZATION:

This course is authorized for use by:

Name Here
Chair, Department/Program

Date here
Date

Approved by Senior Academic Committee March 2024

Please retain this course outline for future educational and/or employment use.