RRC POLYTECH Program and Course Catalogue

PART-TIME | WINNIPEG LOCATIONS

Advanced Manufacturing

Overview

- Post-graduate diploma program
- Classes will be held in the evenings
- How to enroll:
  - Step 1: Submit an Application - Submit an online application for admission into the program. To apply for Fall 2024, click here.
  - Step 2: Register for Courses - Once admitted, register for courses according to your preference. You may enroll in as many courses as you wish, in any order, except for the final Industry Project course. Upcoming courses are listed on the Course Dates and Fees tab.
- Program may be taken part-time or full-time (full-time program will be 8 months, or 1 academic year, in duration)
- Program includes a work-integrated learning component (industry project)

Description

In Manitoba and across Canada, manufacturers are feeling the effects of Industry 4.0 and the need to adapt to the various digital technologies fueling its advance. In the Advanced Manufacturing post-graduate diploma program, you will have the opportunity to develop the skills and competencies to use advanced and emerging technologies to improve and create products or processes in manufacturing. The course work and applied learning activities will allow you to be part of the manufacturing teams of the future that harness technologies including Mechatronics, Artificial intelligence, Robotics, Composites and other innovative technologies. An industry project will provide you with an authentic, work-integrated learning experience with an industry partner.

Course Delivery Methods

The courses in this program will be delivered online, in-person and/or in a blended format. The courses may be taken in any order except for the last industry project course.

Work-Integrated Learning

The Industry Project in Mechatronics course provides 160 hours of work-integrated learning. This industry project will be completed with an industry partner.

Admission Requirements

Your Academic History

If your academic history includes any of the following, please visit My Education for important information: post-secondary studies at an institution other than Red River College Polytechnic; Modified (M), English as an Additional Language (E), or GED high school courses; or home schooling; international secondary (high school) studies.

The college requires transcripts verifying your complete academic history including any public or private high school, college, university, or technical institute you have attended.

Please check the Program Overview page, to see if this program is for Manitoba residents only.

DOCUMENT SUBMISSION

Upload Through Your Future Student Account

- Scan your document(s) and save the file. Ensure you keep your original documents as the College may request to see them at any time.
- Go to apply.rrc.ca and log in.
- Click on your application, then Supplemental Items & Documents.

If you do not have a Future Student Account or require assistance, please contact our Student Service Centre at 204-632-2327.

Internationally Educated Applicants - visit www.rrc.ca/credentials for credential assessment information.

Submission of required documentation indicating proof of completion of admission requirements is due within 30 days of applying unless otherwise noted in the program's admission requirements.

Regular Admission Requirements

1. Post-Secondary Education
   Submit proof of graduation from or enrolment in a diploma or Bachelor's degree in science or engineering from a recognized post-secondary institution:
   - Electrical, Manufacturing, or Mechanical Engineering Technology Diploma
   - Electrical, Manufacturing, or Mechanical Engineering Technology Bachelor's Degree
   - Post-Secondary transcripts must have been issued within 6 months prior to your application date and submitted directly from the post-secondary institution.
   - If you are required to complete an English language assessment, do not submit your transcripts until requested to do so. See English Language Requirements (ELRs) for more information
     and

2. Work Experience
   - Relevant industrial or manufacturing work experience (minimum 8 months - criteria to be determined and evaluated)
   - Work related experience may be demonstrated by submission of a job verification letter, proof of employment, or letter of employment from your employer.
     and

3. English Language Requirements (ELRs)
   - Have you successfully completed the equivalent of three years of full-time secondary (high school) education in Canada, the United States, or an ELR exempt country where English was the language of instruction? To view a list of ELR exempt countries click here.
     - If yes, you appear to meet English language requirements. Submit your transcripts for verification purposes.
       or
     - If no, you are required to submit proof of meeting an English language requirements option. If you choose to complete an English language assessment, review this program's approved assessments and required levels.
       or
     - If you completed all of your education in Canada, the United States, or an ELR exempt country in English but did not complete three years of high school, submit your transcripts for review.

Program Outline

To earn the diploma, you must successfully complete all 10 courses with a minimum GPA of 2.0.

You may take courses in any order, except for the 'Industry Project in Advanced Manufacturing' course, which requires the completion of all 'First courses of study'.

First courses of study:

- Artificial Intelligence
- Composite Manufacturing Process Development
- Cybersecurity for Industry 4.0
- Robotics Applications in Manufacturing
- Leading Change

Second courses of study:

- Mechatronics
- Advanced Manufacturing and Additive Processes
- Business Intelligence
- Manufacturing Systems Automation
- Industry Project in Advanced Manufacturing

Courses and Descriptions

Course	Credit Hours
MANU-3011 Advanced Manufacturing and Additive Processes	3
COMP-3023 Artificial Intelligence	3
COMP-3025 Business Intelligence	3
MANU-3010 Composite Manufacturing Process Development	3
COMP-3024 Cybersecurity for Industry 4.0	6
INDP-4004 Industry Project in Advanced Manufacturing	4
ENGI-3010 Leading Change	3
INST-3003 Manufacturing Systems Automation	3
ELEC-3030 Mechatronics	3
INST-3002 Robotics Applications in Manufacturing	3

COMP-3023
Artificial Intelligence

Artificial intelligence (AI) has the potential to have a profound impact on modern industrial processes. In this post-graduate course, students will review how AI algorithms work and then explore the current capabilities, risks, applications, evolution, and ethics of AI in advanced manufacturing and mechatronics. Having identified an opportunity to use AI at their workplace, students will conduct cost-benefit analyses to enable informed decision-making for AI investments. Students will examine strategies for monitoring the integrity of AI solutions. Finally, students will identify factors used to evaluate the success of implementing an AI solution, including cost, quality, delivery, and performance metrics.

COMP-3024
Cybersecurity for Industry 4.0

The interconnected and digitized nature of Industry 4.0 delivers numerous benefits to manufacturing organizations, but also introduces cybersecurity challenges. In this post-graduate course, students will learn to identify cybersecurity threats, and vulnerabilities throughout the manufacturing environment. Students will illustrate why cybersecurity challenges must be addressed and then follow a standard-based systematic approach to tackle them. Students will learn the importance of continuous attention to cybersecurity to stay ahead of evolving threats and vulnerabilities, and how to build this ongoing attention to cybersecurity into their organizations. The course enables students to communicate effectively with stakeholders about cybersecurity.

COMP-3025
Business Intelligence

Business Intelligence (BI) refers to the technologies, processes, and strategies that organizations use to collect, analyze, and transform raw data into actionable insights for making informed business decisions. In this course, students will examine a wide range of BI activities, including data collection, data analysis, data visualization, reporting, and monitoring. Students will assemble information and generate insights for decision-makers that can guide strategic and operational decisions. This course is designed for professionals at the management level who are seeking to enhance their decision-making capabilities with data-driven insights.

ELEC-3030
Mechatronics

Industry 4.0 mechatronic systems can improve speed, lower expenses, and reduce waste in factory manufacturing tasks and processes. In this course, students will be introduced to mechatronic systems used in common manufacturing environments. Students will investigate inefficient manufacturing processes and identify Industry 4.0 mechatronics solutions to help improve these inefficiencies. Students will write a technical report including a cost-benefit analysis and justify the implementation of a proposed mechatronics system solution in a mock presentation to stakeholders. Finally, students will examine the roles and qualifications of personnel needed to design, deploy, maintain, and repair a mechatronic system.

ENGI-3010
Leading Change

In this post-graduate course, students will advance their ability to communicate accessibly and inclusively throughout organizational change in the manufacturing industry. Students will practice leading and communicating about change throughout its lifecycle, from proposing the change, to supporting an organization during change, through to evaluating the success of the change. Students will learn strategies to create psychological safety within their teams and with stakeholders through open communication, inclusive practices, clear processes, and collaboration. The skills students learn in this course will support their role in organizational growth and innovation.

INDP-4004
Industry Project in Advanced Manufacturing

In this culminating course, students will be challenged to apply their knowledge and skills of advanced manufacturing technology in a real-world application. Working closely with an industry partner and their course instructor, students will identify an actual business need, write a technical report containing a cost-benefit analysis, and pitch their solutions to company decision makers. Upon approval, students will manage a team of specialists through one or more phases of the implementation and lead the change throughout the organization introduced by the innovation. Finally, students will evaluate the impact of the solution on the organization.

Prerequisites:
MANU-3010 ELEC-3030 INST-3002 COMP-3023 and COMP-3024

INST-3002
Robotics Applications in Manufacturing

Is a robot the solution to automating your manufacturing process? Building on their knowledge and experience in advanced manufacturing and mechatronics, students in this course will review the types of robotic systems available and learn to identify inefficient processes and "dirty, dull, or dangerous" tasks. Students will examine key performance indicators and investigate the requirements and constraints that inform a robotic systems solution. They will learn how to organize a team of specialists and tradespeople to design, install, commission, and deploy a robotic system. Finally, students will explore strategies for predictive maintenance and continuous improvement of the manufacturing process.

INST-3003
Manufacturing Systems Automation

Automation helps manufacturing companies remain competitive by reducing manufacturing costs, delivering products on time, and increasing product quality. In this post-graduate course, students will examine common automation components including programmable logic controls (PLCs), input/output (I/O) cards, analog-to-digital converters, solenoid valves, switches, motors, and sensors. Students will compare data collected using bar codes, radio frequency identification (RFID), and vision systems and identify data that determines overall equipment effectiveness (OEE). Students will investigate if a current product or process is suitable for automation and analyze risks and return on investment. Finally, students will draft a roadmap to implement automation in stages.

MANU-3010
Composite Manufacturing Process Development

Companies that manufacture products using traditional methods and materials are finding opportunities to use composite materials in their product design and development process. In this post-graduate course, students will survey products suitable and unsuitable for composites. Students will explore the advantages and disadvantages of various composite materials, processes, and technologies and review regulatory requirements, specifications, and qualifications for composite products. After identifying feasible uses for composites in their workplace, students will design, prepare tooling, and lay up a prototype composite part. Recounting this hands-on experience, students will examine composite manufacturing process flow in order to reduce waste, save time, and optimize productivity.

MANU-3011
Advanced Manufacturing and Additive Processes

In this post-graduate course, students will investigate additive manufacturing (AM) to improve cost, quality, delivery, and performance within organizations. Students will be faced with design challenges in order to gain experience solving problems using AM. The students will find pain points within their organizations that could be solved using AM, analyze the factors and risks, perform a cost-benefit analysis, and create a proposal to ensure that organizational leaders can make informed investment decisions. Students will itemize the key components of technology adoption, data management, and operational plans, so that AM can be successfully implemented and sustained.

IMPORTANT NOTICE:

To register for courses in this program, students must first apply and meet entrance requirements.
To apply, CLICK HERE

Students enrolling in Part-Time and Online Education courses may be required to purchase textbooks and materials at participating Campus Store locations or online at bookstore.rrc.ca. Student booklists will be available approximately 3 weeks prior to scheduled course start dates. Please ensure materials are purchased in advance, to be available for the start date.

Note: Courses requiring a textbook will show "TR" in the Delivery field.

Click the "More Info" link beside the course's name to view the description of the course.

Course Dates and Fees

2025 Fall Term - Continuing Education

COMP-3023 Artificial Intelligence

Location: Notre Dame Campus

Dates

Aug 25, 25 - Sep 24, 25

Class days

M W
5:00PM - 9:00PM

Delivery

LN | TM

Instructor

N. Sidhu

Section

273867

Cost

$782

MANU-3010 Composite Manufacturing Process Development

Location: Notre Dame Campus

Dates

Nov 03, 25 - Dec 03, 25

Class days

M W
5:00PM - 9:00PM

Delivery

LN | TM

Instructor

T. Michaels

Section

273874

Cost

$782

COMP-3024 Cybersecurity for Industry 4.0

Location: Notre Dame Campus

Dates

Oct 02, 25 - Dec 04, 25

Class days

Tu Th
5:00PM - 9:00PM

Delivery

LN | TM

Instructor

N. Sidhu

Section

273881

Cost

$1,502

ENGI-3010 Leading Change

Location: Notre Dame Campus

Dates

Sep 29, 25 - Oct 29, 25

Class days

M W
5:00PM - 9:00PM

Delivery

LN | TM

Instructor

C. Roth-Masson

Section

273901

Cost

$782

INST-3002 Robotics Applications in Manufacturing

Location: Notre Dame Campus

Dates

Aug 26, 25 - Sep 25, 25

Class days

Tu Th
5:00PM - 9:00PM

Delivery

LN TM

Instructor

L. Han

Section

273885

Cost

$782

2026 Winter Term - Continuing Education

MANU-3011 Advanced Manufacturing and Additive Processes

Location: Notre Dame Campus

Dates

Feb 09, 26 - Mar 11, 26

Class days

M W
5:00PM - 9:00PM

Delivery

LN TM

Instructor

C. Roth-Masson

Section

273897

Cost

$782

COMP-3025 Business Intelligence

Location: Notre Dame Campus

Dates

Feb 10, 26 - Mar 12, 26

Class days

Tu Th
5:00PM - 9:00PM

Delivery

LN TM

Instructor

N. Sidhu

Section

273899

Cost

$782

INDP-4004 Industry Project in Advanced Manufacturing

Location: Notre Dame Campus

Dates

Mar 16, 26 - Apr 17, 26

Class days

Delivery

LN TM

Instructor

C. Roth-Masson

Section

273903

Cost

$1,022

INST-3003 Manufacturing Systems Automation

Location: Notre Dame Campus

Dates

Jan 06, 26 - Feb 05, 26

Class days

Tu Th
5:00PM - 9:00PM

Delivery

LN TM

Instructor

T. Michaels

Section

273902

Cost

$782

ELEC-3030 Mechatronics

Location: Notre Dame Campus

Dates

Jan 05, 26 - Feb 04, 26

Class days

M W
5:00PM - 9:00PM

Delivery

LN | TM

Instructor

K. Janzen

Section

273891

Cost

$782

Computer/Laptop Requirements

Online learning is a critical component of course delivery in all Red River College programs. To ensure each student has the tools they need to achieve their academic goals, all Red River College students require, at minimum:

1. Off-campus access to a current Windows based laptop computer with a webcam
2. A high speed internet connection

- Recommended minimum speed: 10 mbps for download, 3 mbps for upload.
- Slower internet connection speeds may result in audio and video issues. Please keep in mind that if others in your home are using the same internet connection at the same time as you are, you may also experience audio and video issues.
- Please refer to https://www.rrc.ca/studentcomputing for further information on Computer Requirements for Students.

Please note that any anticipated costs are not included in Books and Supplies estimates.

Objectives/Learning Outcomes

Upon successful completion of the program, the graduate should be able to:

1. Apply cyber security measures to safeguard data in manufacturing systems.
2. Develop intelligent solutions to optimize processes and improve production equipment.
3. Create products and systems by integrating composites and manufacturing systems.
4. Optimize manufacturing processes by integrating robotics systems and additive manufacturing.
5. Provide technical support for mechatronic projects in a manufacturing environment.
6. Formulate engineering solutions by considering their global, economic, societal, and environmental impact.
7. Practice ethical conduct and professional responsibilities in Advanced Manufacturing environments.
8. Evaluate energy demands, costs, budgets, and other factors to determine return on investment in Advanced Manufacturing.
9. Incorporate data derived from leading-edge information technology systems into manufacturing decisions.
10. Execute management-level decisions within a manufacturing environment based on operations management, supply chain management, and lean manufacturing.

Recognition of Prior Learning

Recognition of Prior Learning (RPL) is a process which documents and compares an individual's prior learning gained from prior education, work and life experiences and personal study to the learning outcomes in College

courses/programs. For more information, please visit www.rrc.ca/rpl.

Graduation Requirements

Successful completion of Terms One and Two with a minimum of 34 credit units and a minimum 2.0 GPA is required to receive the credential.

Academic Advising Service

Our academic advising service can provide information about our full-time programs, explain program admission requirements, and help you select the right program to meet your career and academic goals. We can also connect you with helpful people, resources, and supports.

- For more information visit academic advising.
- If you are an Indigenous student, you can contact an Indigenous Admissions Advisor.
- If you are an international student, you can contact International Education.

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