

- 190205c – Cranking System Fundamentals and Motor Drives
- 190205d – Cranking System Control Circuits
- 190205e – Cranking System Testing and Service
- 190205f – Non-Electric Cranking Systems

DELIVERY MODE(S): In person – Onsite. This course is delivered in person at the NWP Fairview campus.

Note: NWP reserves the right to change the course delivery.

LEARNING OUTCOMES:

- **Caterpillar Electrical Fundamentals**
 - **Unit 4 Lesson 2 – Charging System**
 - Test the charging circuit on the training aid or machine and correctly answer the lab questions regarding charging and circuit testing
 - Test the electrical components of the alternator on the bench and correctly answer the lab questions regarding alternator testing
 - **Unit 4 Lesson 3 – Starting System**
 - Explain the operation of the starting system
 - Test the starting circuit on the training aid or machine
 - Test the electrical components of the starting motor on the bench
- **Apprenticeship ILM Material**
 - **190205a – Charging System and Control Circuit Fundamentals**
 - Explain the operation of 12 volt and 24 volt charging systems
 - **190205b – Charging System Testing and Service**
 - Diagnose and service 12 volt and 24 volt charging systems
 - **190205c – Cranking System Fundamentals and Motor Drives**
 - Explain the operation of 12 volt and 24 volt cranking systems
 - **190205d – Cranking System Control Circuits**
 - Explain the operation of cranking motor control circuits
 - **190205e – Cranking System Testing and Service**
 - Diagnose and service cranking systems
 - **190205f – Non-Electric Cranking Systems**
 - Service and maintain air and hydraulic cranking systems

TRANSFERABILITY: None.

EVALUATIONS:

Starting and Charging Systems..... 56hrs

Exams Average = _____ x 45%

Class Assignments/Quizzes = _____ x 30%

Shop Total _____ x 25%

HES 211 VA22 FINAL MARK = _____ %

GRADING CRITERIA:

Students must complete all required courses with no failing (F) grades. A passing grade in this course is a **minimum of 70%**. Grades for this course will be assigned as a percentage. Failure to achieve a minimum grade of 70% will result in removal from the Think BIG program.

COURSE SCHEDULE/TENTATIVE TIMELINE:

- 12, 24 and Series Parallel Systems
- Starting Motors
- Starter Drive Systems
- Thermal Protection
- Safety Systems
- Troubleshooting
- Alternators
- Generators
- Troubleshooting

STUDENT RESPONSIBILITIES: This is an adult education environment. Enrolment at Northwestern Polytechnic assumes that the student will become a responsible citizen of NWP. As such, each student will display a positive work ethic, take pride in, and assist in the maintenance and preservation

of Institute property, and assume responsibility for his/her education by researching academic requirements and policies, demonstrating courtesy and respect toward others; and respecting instructor expectations concerning attendance, classroom and shop rules, safety, assignments, deadlines and appointments. Students are learning skills to prepare them for the work environment. Non-academic misconduct, including the possession, use, or distribution of intoxicants, will be addressed through the Student Rights and Responsibilities policy.

Students are expected to attend all class and shop hours. Students who miss more than 21 hours or 3 days of classes may be removed from the course.

Absences will be monitored and recorded by the instructors.

- Upon reaching 7 hours missed time in a single semester the student will be required to meet with the program instructor.
- Upon reaching 14 hours missed time in a single semester the student will be required to meet with the instructor and program Chair.
- Upon reaching 21 hours missed time in a single semester the student will be required to meet with the instructor, program chair and the Dean to evaluate the students' ability successfully continue in the Think BIG program.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at

<https://www.nwpolytech.ca/about/administration/policies/index.html>

**Note: all Academic and Administrative policies are available on the same page.