

WESTERN TECHNICAL - COMMERCIAL SCHOOL

COURSE OUTLINE



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| COURSE TITLE: | Computer Engineering Technology: Robotics and Control System | CODE: | TEJ3M1 |
| SUBJECT AREA: | Technology Education | RESOURCES: | www.mfranzen.ca |
| TEACHER NAME: | Mr. Franzen | DATE: | Sept 2022 |
| PREREQUISITE: | None | COURSE COST MATERIAL FEE: | None |

COURSE DESCRIPTION:

This course examines computer systems and control of external devices. Students will assemble computers and small networks by installing and configuring appropriate hardware and software. Students will develop knowledge and skills in electronics, robotics, programming, and networks, and will build systems that use computer programs and interfaces to control and/or respond to external devices. Students will develop an awareness of related environmental and societal issues, and will learn about college and university programs leading to careers in computer technology. Focus will support robotics and the Robo program here at Western.

COURSE DESTINATION: UNIVERSITY/COLLEGE IN AREAS OF COMPUTERS, PROGRAMING, ROBOTICS, ENGINEERING, DESIGN, NETWORKING, AND TRANSPORTATION

COURSE UNITS:

| Unit | Description | Length | Evaluation Strategies |
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| 1 | Safety & Careers - intro, organization, safety, journals, project ideas, and career pathways | 3 Weeks | Research, poster, assignments, journal, presentation |
| 2 | Computers & Components - electronics, operation, design, troubleshooting, and maintenance | 3 Weeks | Journal, presentation, assignments, practical activities |
| 3 | Digital Logic & Circuits - binary, boolean, logic gates, counters/register ccts., calculations, design, and build | 3 Weeks | Journal, assignments, observation, practical activities |
| 4 | Networking & Programming - IP addressing, data routing protocols, services, languages, and concepts | 4 Weeks | Journal, assignments, practical activities |
| 5 | Human Robot Interface & Control - custom project | 4 Weeks | Journal, practical activities, demonstration, presentation |
| 6 | Learning showcase portfolio report | 1 Week | Review, reporting, peer fb |

OVERALL EXPECTATIONS: By the end of the course students will...

- A1. describe how computer components function, and discuss trends in the development of computer hardware;**
- A2. describe the functions of BIOSes and operating systems, and how they interact with each other and with computer hardware;**
- A3. describe the function of electronic components and the use of these components in control systems and other circuits, and calculate values for circuit components;**
- A4. describe network concepts, services, and security;**
- A5. demonstrate an understanding of the use of binary numbers, hexadecimal numbers, and Boolean algebra in computer logic and data processing.**

- B1. build, configure, and maintain a computer system, and connect peripheral devices;**
- B2. set up, optimize, and back up a computer system;**
- B3. design, construct, create diagrams for, and troubleshoot electronic circuits and interfaces for control systems;**
- B4. design, install, configure, test, and troubleshoot networks;**
- B5. demonstrate an understanding of fundamental programming concepts, and develop a program that interacts with an external device.**

- C1. describe environmental issues related to the widespread use of computers and associated technologies;**
- C2. describe societal issues related to the widespread use of computers and associated technologies.**

CLASSROOM EXPECTATIONS

- Come to class on time and be prepared and willing to actively participate in every lesson.
- Treat others with respect and courtesy.
- Ask the teacher for extra help if needed.
- Bring a 3-ring binder or equivalent with paper, pen, pencil, ruler, calculator, and a flash memory stick.
- Distractions such as phones or MP3 players not to be used in class and internet use not to be abused.
- Continually expand and report on your unique learning with new related course knowledge, skills, and values.
- Take the initiative, be a team player, co-operative with peers, complete homework, and make your best effort.

ATTENDANCE MISSED TESTS AND EVALUATIONS

- Bring a note from parents the day after an absence to explain the absence.
- Be aware that a mark of zero will be assigned to students who miss presentations, tests or assignments without a valid explanation. It is the student's responsibility to make arrangements, ahead of time, for any evaluations that are missed. If a student misses an evaluation for an unforeseen reason such as illness or family emergency, the student must bring a note signed by a parent or guardian and be prepared to write/make-up the evaluation immediately upon return to school.

ACADEMIC INTEGRITY

- Plagiarism and/or copying will result in a mark of **zero** for everyone involved. Further action may be taken including suspension from school. Teachers will clearly define and discuss consequences of plagiarism with students at the beginning of each semester.

LATE ASSIGNMENTS

- All assignments must be handed in to the teacher on the due date, before class starts that day. Late mark of 10% will be deducted from assignments handed in past the due date, prior to the cut off date. A mark of zero will be assigned if the assignment is handed-in after the cut-off date.

MISSED EXAMINATIONS

- Students are required to write all scheduled examinations. A student who misses any examination due to illness must present a medical note, stating that the doctor was aware that a medical reason prevented the student from writing the exam.

TEACHING/ASSESSMENT/EVALUATION STRATEGIES

Learning Activities: Hands-on-activities, assignments, journals, demonstrations, research, presentations, videos, illustrations, posters, tutorials, computers, controllers, programming, practical projects, circuit design and building

Culminating Activities: Technical report, journal entries, project reviews, related images, summaries, and conclusion

EVALUATION OF STUDENT ACHIEVEMENT

Student achievement is measured relative to curriculum expectations across four weighted Achievement Categories (Knowledge/Understanding, Thinking/Inquiry, Communication, and Application).

Term Work: 85% (Knowledge/Understanding, Thinking/Inquiry, Communication, Application)

Culminating Activities: 15% Learning Showcase Portfolio

Learning Skills: including: Responsibility, Organization, Independent Work, Collaboration, Initiative, and Self-Regulation are evaluated on each Report Card as: **E** (excellent); **G** (good); **S** (satisfactory); or **N** (needs improvement).

WESTERN TECHNICAL-COMMERCIAL SCHOOL

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For online access to class journal, content, student marks and resouces: www.mfranzen.ca,

Best way to contact, is through e-mail: Michael.Franzen@tdsb.on.ca



Teacher's Signature

Student's Signature

Parent's Signature

Mr. Franzen

Teacher's Name printed

Student's Name Printed

Parent's Name Printed