Dominican International School
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ICT & ROBOTICS 8 SYLLABUS

School Year	2025-2026
Subject	ICT & Robotics 8
Grade Level	Grade 8
Teacher	Mr. Edward Solis
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COURSE DESCRIPTION:

Part 1: The Robotics curriculum opens the exciting world of computer science and robotics to middle school students in a fun and practical way. The lessons are constructed from hundreds of hours of actual middle school classroom experience. The learning activities are created from fun robotic projects designed to be inspiring and engaging, helping students see computing and technology as an important part of their world. The activities are designed with a focus on problem-based learning, creativity, exploration, critical thinking, and problem-solving. Learn computer programming concepts and develop Scratch coding skills. Study the basic elements of algorithms such as sequence, decision, and iteration. Learn about using pseudocode, flowcharts, and block diagrams. Develop programs with variables, loops, conditional instructions, and functions. Learn how to assemble mBot and understand basic robot system components. Use the scientific method to perform characterization studies of mBot sensor operation. Learn about robotic command and control programs by designing a state machine. Design an integrated, multi-input/output, robotic control program using the mBot RGB LEDs, Piezo Buzzer, Motors (Forward, Right Turn, Left Turn, and Backwards), Ultrasonic Sensor, Line Follower Sensor, and Light Detector Sensor. Explore the Software Development Life Cycle and learn about brainstorming, project planning, and the importance of reuse in technology development.

Part 2: Page Designing. This course introduces the basic principles of imaging and graphic design using Adobe Photoshop in preparation for their yearbook page. From simple photo editing and compositing to digital painting, and graphic design.

Teaching materials for the course come from textbooks, classroom lectures, newspapers, journals, medical newsletters, videos, and the Internet.

REFERENCE:

- **Programming Arduino: Getting Started with Sketches**, Second Edition by *Simon Monk*

- **mBot Discovery: Learn & Teach Robotics In 12 Fun Lessons**, 2018 by *David Romano*

REFERENCE/LINKS:

- https://www.amazon.com/Programming-Arduino-Getting-Started-Sketches/dp/1259641635/ref=zg_bs_3956_3?_encoding=UTF8&psc=1&refRID=5R39R5EMX0GBCS70C1J5

- https://www.amazon.com/mBot-Discovery-Learn-Robotics-Lessons/dp/0692139435/ref=sr_1_fkmr0_1?keywords=mBot+discovery+LEVEL+1&qid=1566007201&s=gateway&sr=8-1-fkmr0

ROBOTICS STANDARDS:

- https://educationalliancefinland.com/products/mbot-series-steam-robots

Our school website: http://www.dishs.tp.edu.tw/

Course Content:

The students will learn the different ways of Desktop Publishing, particularly page layout and design. Also, the course contains the basic modules in C Programming which would lead to basic Robotics.

Course Goal

- The students will learn simple C programming leading to Robotics
- The students will discover how to write basic sketches
- The students will use Arduino's modified C language, store data, and interface with the Web
- The students will get hands-on coverage of C++ library writing, and programming Arduino for the Internet of things.
- The students will understand Arduino hardware fundamentals
- The students will learn to produce positive and constructive interactions among the group members
- The students will learn to enhance further their skills in applying the different software
- The students will learn how to organize their ideas in creating the desired outcome
- The students will learn about using pseudocode, flowcharts, and block diagrams.
- The students will develop programs with variables, loops, conditional instructions, and functions.
- The students will learn how to assemble mBot and understand basic robot system components.
- The students will use the scientific method to perform characterization studies of mBot sensor operation.
- The students will learn about robotic command and control programs by designing a state machine.

- The students will design an integrated, multi-input/output, robotic control program using the mBot RGB LEDs, Piezo Buzzer, Motors (Forward, Right Turn, Left Turn, Backwards), Ultrasonic Sensor, Line Follower Sensor, Light Detector Sensor.
- The students will explore the Software Development Life Cycle and learn about brainstorming, project planning, and the importance of reuse in technology development.

Grading Criteria:

The quarterly grade will be awarded for all student work based on the following criteria:

- ✓ **Class participation and Seatwork** - 3/10 of quarterly grade
- ✓ **Major Projects, Quizzes, and Tests**- 3/10 of quarterly grade
- ✓ **Quarterly Exams**- 3/10 of quarterly grade
- ✓ **Deportment** - 1/10 of quarterly grade

Student Materials Required:

- The students will need to bring a flash drive (USB drive) to save their works

Laboratory Expectations:

1. Be on time to class; be seated **before** the bell rings.
2. Wear your uniform neatly.
3. Use English at all times.
4. Come prepared with books, assignments, and supplies and without gum, food, or drink (a sealable water bottle is okay).
5. Be respectful of others (especially when speaking), and of school property.
6. Do your best and participate.
7. Ask permission before leaving the class; take a hall pass.
8. Wait for the bell to ring before you leave class.

Seatwork rules

1. The students may NOT copy from classmates
2. The students are allowed to help each other verbally.
3. The students are NOT allowed to do the work, partially or entirely, for other students. Specifically, they are not allowed to touch the keyboard and mouse of other students' computers.

Discipline:

1. Verbal warning, second reminder (if needed)
2. Write-Up and then refer to the Discipline Office.
3. Parent-Teacher conference.

First Quarter Tentative Course Content

Week/Date	Topic/Projects/Assessments
Week 1	• Course Introduction • Seat Plan • Netiquettes
Week 2	• Random Motion
Week 3	• Robot Designing
Week 4	• Mixed Colors and Sounds
Week 5	• Robot Designing II
Week 6	• Robot Designing III
Week 7	• Quarterly Exams
Week 8	• First Quarter Exam

Second Quarter Tentative Course Content

Week/Date	Topic/Projects/Assessments
Week 1 (11)	• Control Movement Program
Week 2 (12)	• Cliff Detection Program
Week 3 (13)	• Avoid Barriers Program
Week 4 (14)	• Line Following Program
Week 5 (15)	• Robot Wrestling Program
Week 6 (16)	• Line Counting Program
Week 7 (17)	• Matrix Connection Program
Week 8 (18)	• Second Quarter Exam

Third Quarter Tentative Course Content

Week/Date	Topic/Projects/Assessments
Week 1 (20)	• Serial Communication
Week 2 (21)	• Object Avoidance Program
Week 3 (22)	• Maze Problem
Week 4 (23)	• Communication Problems
Week 5 (24)	• Changing Colors with Variables
Week 6 (25)	• Robot Racing Competition
Week 7 (26)	• Soccer Competition
Week 8 (27)	• Temperature Sensor Program
Week 9 (28)	• Third Quarter Exams

Fourth Quarter Tentative Course Content

Week/Date	Topic/Projects/Assessments
Week 1 (29) (	• Introduction to Canva
Week 2 (30)	• Image gathering and uploading to Canva
Week 3 (31)	• Graphic Designing
Week 4 (32)	• Digital Painting
Week 5 (33)	• Yearbook page Construction
Week 6 (34)	• Yearbook page Construction
Week 7 (35)	• Fourth Quarter Exams
Week 8 (36)	• Fourth Quarter Exams