

Classroom Organization

Course Overview

Introduction to Programming Natural Language is a course designed to bridge programming from the drag-and-drop NXT interface to programming with ROBOTC. Natural Language is a ROBOTC feature designed to help new programmers learn to write code in a simpler format and focus on common robot behaviors. The goal of the Natural Language is to lower the obstacle of entry into text-based programming languages. It accomplishes this goal via two main techniques:

1. The lines of code that make up entire robot “behaviors” are consolidated into single commands. For example, moving forward, line tracking and turning are all single-line commands. New programmers will be able to use these commands to concentrate on breaking down problems and learning how to think logically, instead of focusing on symbols and punctuation.
2. The names given to the new commands are simple and easy to remember. For example, a student who wants to program the robot to move forward, will simply place the word “forward();” in the code.

Natural Language will provide new programmers an assisted, hands-on experience in logical thinking, supported by the scaffolding necessary to take the next steps in programming. As students become more comfortable with Natural Language, they can transition to full ROBOTC by incorporating ROBOTC commands into their programs.

Course Structure

It is essential to organize the classroom effectively; and several tools will help you with this task. The first is the Learning Management System (LMS). The LMS is designed as a one-stop location for all the resources required to teach Introduction to Natural Language. Resources include:

- **Reference Documents:** Informative documents for programming functions and sensors.
- **Theme Related Documents:** Informative documents directly related to the course theme and required for learning.
- **Rubrics:** Assessment tools that evaluate student achievement based on specific criteria.
- **Videos:** Short informative movie clips directly related to the content.
- **Presentations:** Informative series of slides directly related to the learning.
- **Teacher Notes Documents:** Detailed instructional and learning information for each individual learning module. The teacher notes include: overview, objectives, required resources, estimated class time, real world connection, step by step instructions, troubleshooting tips, reflective questions, discussion questions, enhancements, additional resources and references.
- **Student Challenge Documents:** Detailed student information required to complete challenge activities in each of the learning modules. The student challenge includes: goals, objectives, materials list, background information, step by step instructions, reflection questions and references.
- **Activities:** Additional activities directly related to specific learning modules.
- **Other Resources:** Supporting tools such as Venn diagrams, maps, templates, spreadsheets, coding sheets and more.

While this course focuses on teaching programming skills via robotics, the learning modules offer opportunities to teach concepts from other content areas, such as mathematics, science, technology, engineering and the arts. This course consists of 21 modules, which build upon student skills and knowledge in a scaffolding approach. Because the modules build upon one another, they need to be taught sequentially. Each learning module will have teacher notes, a suggested timeline for instruction, student challenge documents (modules 4-21) and other resources.

The first module, Classroom Organization, features course-specific PDF documents that provide general course-wide information. These documents include:

- **Organizational Suggestions:** Information on software, batteries, robot modification, course/pathway suggestions and additional assistances.
- **Module Checklist:** Checklist for organizing and running a robotics classroom.
- **Robotics Glossary:** Word definitions specific to robotics.
- **Engineering Journal:** Overview of required Engineering Journal as an assessment tool and resource for students.
- **Safety Documents:** Informational documents for establishing a safe work environment for students and teachers.
- **Pacing Guide / Syllabus:** A detailed, sequential timeline of learning that includes module topic, description, objectives and session times.

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- **Curriculum Standards:** Each module addresses specific math, science, technology, language arts and 21st century skills. Although these are mapped to U.S. standards, they could be mapped to those of any country.
- **Learner Centered Classroom:** Detailed description of the “Teacher as Facilitator” classroom environment that describes the coaching role you will play in addition to your conventional role as an instructor.

Finally, you will be enrolled in the Teacher Resource Course. This course is designed specifically with teachers in mind. It is a place to go ask questions, review training sessions and find extra resources that may be helpful in your teaching. We are here to help you, so please don't hesitate to reach out and ask. If you are in need of technical support, please email STEMSupport@icarnegie.com

Please provide feedback on these materials by submitting the Lessons Learned Survey at the end of each module.

Good luck and we hope you enjoy your robotics journey!