INTRODUCTION TO COMPUTATIONAL THINKING FOR EVERY EDUCATOR
ONLINE COURSE SYLLABUS

Course Description

The goals of this course are to increase awareness of Computational Thinking (CT) among educators world-wide and encourage them to integrate CT into their curricula. The course is divided into five sections, each focusing on the following:

- **INTRODUCING COMPUTATIONAL THINKING:** What is CT? - What is computational thinking, where does it occur, why should you care, and how is it being applied?
- **EXPLORING ALGORITHMS:** Walk through examples of algorithms used in your subject. Recognize why algorithms are powerful tools to increase what you can do and that technology can be useful for implementing and automating them.
- **FINDING PATTERNS:** Explore examples of patterns in various subjects and develop your own processes for approaching a problem through pattern recognition.
- **DEVELOPING ALGORITHMS**: Increase your confidence in applying the computational process to a given problem and recognize how algorithms can articulate a process or rule.
- **FINAL PROJECT: APPLYING CT**: Create a statement of how CT applies to your subject area and design a plan to integrate it into your work and classroom.

Course Structure

This course consists of five modules including a two-part final project. Each module includes a mix of lessons and activities. Examples of lesson activities includes example simulations, programs, and exercises that increase awareness of CT, showcase the integration of CT, and allow you to interact and develop CT into your subject area. The lesson activities also provide how-to steps for accomplishing tasks in the activities, links to learning more, activities for practicing the skills and getting feedback, and a discussion community for sharing ideas and getting help. The final project provides a chance for you to apply skills learned in the course.

Course Goals and Outcomes

By the end of this course, the goal is that you will be able to teach CT concepts in your classroom right away. Instead of creating all-new lessons, CT can enhance many of your current classroom lessons.

Participant Profile

This Computational Thinking course is designed for all K-12 education audiences seeking to integrate computational thinking into their classroom.

ISTE Standards and Competencies

The course is designed and developed around ISTE's Standards, with a strong emphasis on the ISTE Standards for Educators, and ISTE Standards for Computer Science Educators.

Module Descriptions

MODULE 1: INTRODUCTION TO COMPUTATIONAL THINKING

In this module, you can explore the foundations of computational thinking, where these concepts occur within different subject areas, examine the impact of incorporating computational thinking into practice, and begin to explore how is it being applied within various subject areas.

MODULE 2: EXPLORING ALGORITHMS

In this module, you can try some activities that could be modified to use in your classroom. These activities do not require any coding, and are intended to provide examples of what is possible using algorithms and computational thinking.

MODULE 3: FINDING PATTERNS

In this module, you can try some activities that you can also modify for use in your classroom. These activities involve editing existing code, but no prior experience with programming is required. This is an opportunity to experience the process of computational thinking in different subjects, so feel free to try the activities outside of your subject area.

MODULE 4: DEVELOPING ALGORITHMS

In this module, you can try some activities that you can modify for use in your classroom. These activities involve developing an algorithm and might involve editing existing code or writing additional code. No prior experience with programming is required. These activities apply the process of computational thinking, with a focus on algorithm design.

MODULE 5: APPLYING COMPUTATIONAL THINKING

In this module, you will use the skills from this course to increase the efficiency or effectiveness of the integration of computational thinking in your classroom teaching and complete a two-part project. In Part I of this project, you will create a statement of how computational thinking applies to your domain or subject. In Part II of this project, you will document your plan for integrating at least one computational thinking concept into a lesson, activity, unit, project, module, or curriculum.

Completion Criteria

To receive the certificate of completion, you must submit all assignments and turn in your final project.

Disclaimers

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NOTE: A variety of applications are highlighted throughout this course. Prior to using any of them with students, it is imperative that participants check the account requirements for each application against their school/district student data privacy policy to insure the application complies with district policy. In addition, some applications' Terms of Service may require parental permission to be COPPA and FERPA compliant for students younger than 13 years of age.

Content in this course is subject to change at instructor's or ISTE's discretion.