Dominican International School
Grade 12 Computer Science
SY: 2024-25

Grade Level /12
1 Year

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Course Description

Welcome to Computer Science 12 at Dominican International School. Computer Science 12 covers half of Code.org's Computer Science Discoveries, a rigorous, entry-level course that introduces high school students to the foundations of modern computing. The CS Principles course covers a broad range of foundational topics such as programming, algorithms, the Internet, big data, digital privacy and security, and the societal impacts of computing. For more details see, the code.org links in the references section. This course uses the fantastic Code.org's CS Principles Curriculum, for more details, please see the 2022-23 Curriculum Guide.

Curriculum Overview and Goals

Computing affects almost all aspects of modern life and all students deserve access to a computing education that prepares them to pursue the wide array of intellectual and career opportunities that computing has made possible.

Content

The content covered in this year includes:
- Unit 3: Intro to App Design
- Unit 4 - Variables, Conditionals, and Functions
- Unit 5 - Lists, Loops, and Traversals
- Unit 7 - Parameters, Return, and Libraries
- Final Project

Classroom Practices

In this course the teacher acts more as a facilitator in learning, as opposed to the expert providing facts to be memorized by the students. This course focuses heavily on the processes of discovery and how we engage with ideas and information. Students will be presented with problems for which they discover and apply their own solutions based on the skills learned in the unit.

Student Engagement and Learning

The materials provided by Code.org are designed with activities that are relevant to students' lives and provide them with authentic choice. Students will find success in this course when they engage with curiosity and creativity. Social activities include presentations, peer feedback and shared reflections.

ESLRs D'TORCH (Truthful, Organized, Reflective, Courageous and Helpful)

In CS classes the categories of the D'TORCH most practiced and assessed are:
- Organized - Students utilize Google Classroom to edit, submit and keep track of their assignments.

- Reflective - Students will regularly write activity reflections in their online journal.
- Helpful - Students are empowered to ask for and provide explanations and give examples to help classmates through particularly difficult problems.

Class Expectations

- Come to class on time and be prepared
- Have a positive attitude and be willing to learn.
- Respect yourself, others, and our school.
- Always complete your work and try your best.
- Actively participate, listen carefully, but don't speak out of turn.
- All assignments must be completed.

Homework and Quiz Rules

- All assignments must be turned in on the day they are due.
- 1 day late = Maximum of only 60%
- 2+ days late = Project-I & Only 60%
- If a student has been absent, it is his/her duty to find out what work is due, and hand it in a day later.
- All assignments must satisfactorily be completed.
- If you are absent on the day of a quiz, you will only be able to get a maximum of 60%.

Classroom Rules

- All students are expected to follow the rules. Consequences will follow if rules are broken.
- Read and follow the standard school rules.
- Be on time and neatly dressed, in full school uniform.
- Speak in ENGLISH ONLY.
- Respect your teachers, fellow students and their property.
- Keep your seating space and classroom clean and neat.
- No eating or drinking in the ICT Labs.
- Ask permission to leave the class.

Academic Dishonesty means employing a method or technique or engaging in conduct in an academic endeavor that contravenes the standards of ethical integrity expected at DIS. Academic dishonesty includes but is not limited to, the following:

1. Purposely incorporating the ideas, words of sentences, paragraphs, or parts thereof without appropriate acknowledgment and representing the product as one's own work; and
1. Representing another's intellectual work such as photographs, paintings, drawings, sculpture, or research or the like as one's own, including failure to attribute content to an AI.
2. Employing a tutor, making use of Artificial Intelligence without acknowledgement, getting a parent to write a paper or do an assignment, paying for an essay to be written by someone else and presented as the student's own work.
3. Committing any act that a reasonable person would conclude, when informed of the evidence, to be a dishonest means of obtaining or attempting to obtain credit for academic work.

Any act of academic dishonesty will result in an automatic zero on the entire assignment

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Discipline

- Verbal warning
- Write-Up, entered into the discipline system and then referral to the Discipline Office.
- Parent-Teacher conference as required.

Links, tools and references:

- [Computer Science Principles '24-'25](#)
- [App Lab](#) — A browser-based JavaScript programming environment for creating interactive apps, with the ability to freely switch between programming in blocks or text

Schedule CS 12
1st QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	**Topic / Projects / Assessments**
Week 1 **Aug 12th to 16th** **4 Days of Class** 12~ First Day / Orientation Day 15~ Opening Mass & Assumption of Our Lady 8:00 15~ Induction of Class, Student Council Officers and DYM	**Unit 3: Intro to App Design** Lesson 1 Introduction to Apps Lesson 2 Introduction to Design Mode
Week 2 **Aug 19th to 23rd**	Lesson 2 Introduction to Design Mode Lesson 3 Project - Designing an App Part 1
Week 3 **Aug 26st to 30th** 26~Fire drill? 26~Middle and High School Catholic Bridge Program (after assembly) 28~St. Dominic de Guzman Feast Day Celebration	Lesson 4: The Need for Programming Languages Lesson 5: Intro to Programming
Week 4 **Sep 2nd to 6th** 2~House Ceremony	Lesson 6 Debugging Lesson 7 Project - Designing an App Part 2 Quiz 1
Week 5 **Sep 9th to 13th** 9~ Mass & Birthday Mother Mary& VIP Induction	**Unit 4 - Variables, Conditionals, and Functions** Lesson 1 Variables Explore (Complete before Class) Lesson 2 Variables Investigate Lesson 3 Variables Practice
Week 6 **Sep 16th to 20th** **1 Day of Class** 17~Moon Festival 18-20~ Teacher's Conference	Lesson 4 Variables Make Lesson 5 Conditionals Explore
Week 7 **Sep 23rd to 27th** 24-26~Pre-Exam Days	Lesson 6 Conditionals Investigate Lesson 7 Conditionals Practice
Week 8	**Q1 Final Exam**

Week / Date	
Sep 30th to Oct 4th	
Week 9 **Oct 7th to 11th**	No Class 1 Day of Class 7~Launching - Rosary Month and Bullying Prevention Day 8-9 ~Q1 Exams 10~Double Ten 11~Record Day

2nd QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	Topic / Projects / Assessments
Week 1 (10) **Oct 14th to 18th** 14~ Second Quarter Begins	Lesson 8 Conditionals Make Lesson 9 Functions Explore / Investigate
Week 2 (11) **Oct 21st to 25th** 25 – Book Fair 25- Masquerade Night	Lesson 10 Functions Practice Lesson 11 Functions Make
Week 3 (12) **Oct 28th to Nov 1st** 1-All Saint's Day Mass	Lesson 12 Project - Decision Maker App Part 1 Lesson 13 Project - Decision Maker App Part 2
Week 4 (13) **Nov 4th to Nov 8th**	Lesson 14 Project - Decision Maker App Part 3 **Unit 5 - Lists, Loops, and Traversals** Lesson 1: Lists Explore (Student do independently) Lesson 2: Lists Investigate
Week 5 (14) **Nov 11th to 15th**	Lesson 3 Lists Practice Lesson 4 Lists Make
Week 6 (15) **Nov 18th to 22nd** 22-Gr.12 Q2 Exam 22 - YSC Contest	Lesson 5 Loops Explore Lesson 6 Loops Investigate
Week 7 16) **Nov 25th to 29th** 25-Gr.12 Q2 Exam 26-28~Pre-Exam Day	Lesson 7 Loops Practice Lesson 8 Loops Make
Week 8 (17) **Dec 2nd to Dec 6th** **6~Half Day** Foundation Day Celebrations	**Q2 Final Exam**

Week / Date	Topic / Projects / Assessments
Week 9 (18) **Dec 9th to 13th** <u>**3 Days of Class**</u> 12-13 ~Q2 Exams	Review
Dec 16th to Jan 3rd	**Christmas Holiday**

3rd QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week / Date	Topic / Projects / Assessments
Week 1 (19) **Jan 6th to 10th** <u>**4 Days of Class**</u> 6~Record Day 7~Third Quarter Begins 10 ~ New Year Mass	Lesson 9 Traversals Explore Lesson 10 Traversals Investigate
Week 2 (20) **Jan 13th to 17th**	Lesson 11 Traversals Practice Lesson 12 Traversals Make
Week 3 (21) **Jan 20th to 24th**	Lesson 13 Project - Hackathon Part 1 Lesson 14 Project - Hackathon Part 2
Jan 27th to Jan 31st	**CNY Holiday**
Week 4 (22) **Feb 3rd to 7th**	Lesson 9 Traversals Explore Lesson 10 Traversals Investigate
Week 5 (23) **Feb 10th to 14th** 1-14~Catholic Week	Lesson 11 Traversals Practice Lesson 12 Traversals Make
Week 6 (24) **Feb 17th to 21st**	Lesson 13 Project - Hackathon Part 1 Lesson 14 Project - Hackathon Part 2
Week 7 (25) **Feb 24th to 28th** <u>**4 Days of Class**</u> 24~Lenten Mass? 25-27 ~ Pre-Exam Days 24-27~IOWA Assessments 28 ~ Memorial Day Holiday	Lesson 15 Project - Hackathon Part 3 Lesson 15 Project - Hackathon Part 3
Week 8 (26) **March 3rd to 7th**	**Final Exam**

5~ Ash Wednesday	
Week 9 (27) **March 10th to 14th** **4 Days of Class** 14 – Q3 Exams	Hackathon Sharing

4th QUARTER – TENTATIVE COURSE CONTENT

Week / Date	Topic / Projects / Assessments
(NB: Depending on time and interest, the teacher may delete and/or add other selections.)	
Week 1 (29) **March 13th to 17th** **4 Days of Class** *13 – Q3 Exams* *14~ Q4 Begins*	**Unit 7 - Parameters, Return, and Libraries** Lesson 1 Parameters and Return Explore (Independent work) Lesson 2 Parameters and Return Investigate Lesson 3 Parameters and Return Practice
Week 2 (30) **March 18th to 22nd** *18-21 ~ Fire Drill*	Lesson 4 Parameters and Return Make Lesson 5 Libraries Explore
Week 3 (31) **Apr 8th to 12th** *10 ~ Easter Mass*	Lesson 6 Libraries Investigate Lesson 7 Libraries Practice
Week 4 (33) **Apr 15th to 19th**	Lesson 8 Project - Make a Library Part 1 Lesson 9 Project - Make a Library Part 2
April 14th to April 18th	**Easter Break**
Week 5 (32) **Apr 21st to 25th**	Lesson 10 Project - Make a Library Part 3 Library Feedback
Week 6 (33) **Apr 28th to May 2nd**	Project Sharing
Week 7 (34) **May 5th to 9th**	**Q4 Final Exam**
Week 8 (35) **May 12th to 16th**	Presentations
Week 9 (36) **May 19th to 23rd**	19-23 ~ Student Clearance 19~ Baccalaureate Mass 23~Gr. 6 – 7 Recognition and Gr. 8 Graduation
Week 10 (37) **May 26th to 30th**	4 Days of Class 26~House Culminating Activity 27~Gr. 9-11 Recognition and Gr. 12 Graduation 28! Class Party 29- ~ Students Last Day 30~ Teachers/Staff Meeting

The end ~ Have a great summer 😊

CS Subject Sequence 24-25

			High School CS Curriculum	
Type	**Classes (45m)**	**HW (45m)**	**Grade, Curriculum and Description**	
Subject CS	2	2	**G09 CS Discoveries**	**G10 CS Discoveries**
			[Code.org Discoveries](#) Unit 1 Problem Solving and Computing Unit 2 Web Development Unit 3 Animations and Games	Unit 4 - The Design Process Unit 6: Physical Computing
			G11 CS Principles	**G12 CS Principles**
			[Code.org CS Principles](#) Unit 1 - Digital Information Unit 5: Data Unit 8: Cybersecurity and Global Impacts Unit 7 (CSD): AI and Machine Learning	Unit 5 Building Apps Unit 4 Big Data and Privacy Unit 6 Making Data-backed Apps
AP	6	6	**G11 APCS A JAVA** **CSAwesome**	**G12 APCS Principles** **CS50AP**
			The course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing.	This course offers a multidisciplinary approach to teaching the underlying principles of computation. The course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing.

High School CS Curriculum Overview

Our computer science curriculum is designed to provide a comprehensive and flexible learning experience from grades 9 through 12, catering to both potential CS majors and students seeking a well-rounded CS education.

Curriculum Progression and Options

1. **Grades 9-10: CS Discoveries**

   - Foundational for all students

- Covers problem-solving, web development, animations, games, and the design process
- Introduces physical computing concepts

2. **Grades 11-12: Flexible Pathways**

   a) **Minor Subject Track: CS Principles**

   - Ideal for non-CS majors or those seeking a science AP credit
   - Builds on CS Discoveries with more advanced topics
   - Explores digital information, the Internet, data analysis, cybersecurity, and machine learning
   - Provides a well-rounded CS experience without the intensity of the AP track

   b) **AP Track for Prospective CS Majors**

   - Grade 11: APCS A JAVA
     - Introduces fundamental CS topics with a focus on Java programming
     - Covers problem-solving, design strategies, data organization, and algorithmic approaches
   - Grade 12: CS50AP (AP Computer Science Principles)
     - Culminating course offering a multidisciplinary approach to computation
     - Prepares students for college-level CS and the AP exam

Curriculum Flexibility and Benefits

1. **Options for Various Academic Paths**:

   - Students not planning to major in CS can take CS Principles in grades 11 and 12 as a minor subject, fulfilling science AP credit requirements while gaining valuable CS knowledge.
   - Those considering a CS major in college can opt for the more intensive AP track.

2. **Well-Rounded CS Experience**:

   - The CS Principles track ensures students gain a comprehensive understanding of CS concepts without the rigorous demands of AP courses.
   - Ideal for students interested in CS as a complementary skill to their primary academic focus.

3. **Preparation for CS Majors**:

   - The AP track provides in-depth preparation for students planning to pursue CS in college.
   - APCS A JAVA and CS50AP offer college-level content and prepare students for advanced studies.

4. **Flexibility to Change Paths**:

   - Students can reassess their interests and switch tracks between grades 10 and 11 if their academic goals change.

CS50AP as the Capstone for AP Track

For students on the AP track, CS50AP serves as a rigorous capstone, building upon APCS A JAVA and previous coursework. Its comprehensive nature makes it an ideal final course, covering advanced topics and preparing students for college-level CS studies.

Practical Application

To complement both curriculum tracks, we encourage all CS students to apply their skills through our Service Learning program. The HS CS department collaborates with this program to help students identify opportunities where they can

use their computer science knowledge in real-world contexts, enhancing their learning experience regardless of their chosen track.

Curriculum Development and Stakeholder Feedback

At our school, we are committed to continuously evaluating and improving our CS curriculum to ensure it meets the needs of our students and prepares them for future academic and career challenges. Our approach includes:

1. **Curriculum Trials and Evaluation**:

   - We regularly explore potential additions to our curriculum. For example, in previous years, we conducted trials of CS50 SQL and CMU's College Level Programming courses.
   - These trials helped us assess the value and fit of new courses within our existing framework.

2. **Rigorous Assessment**:

   - Through these trials, we found that even with highly capable and enthusiastic students, our current AP track, culminating in CS50AP, already provides sufficient content, topics, and rigor.
   - This reinforced our confidence in the comprehensive nature of our existing curriculum.

3. **Stakeholder Engagement**:

   - We actively seek and encourage feedback from all stakeholders, including students, parents, administrators, and industry professionals.
   - This collaborative approach ensures our curriculum remains relevant and aligned with both academic standards and real-world needs.

4. **Adaptive Planning**:

   - Based on stakeholder input, we continually refine our approach to practical skill application.
   - For instance, after extensive consultation, we determined that integrating industry-related skills and community engagement through our existing Service Learning program was the most effective approach.

5. **Ongoing Collaboration**:

   - The High School CS department works closely with the Service Learning program to help students identify opportunities to apply their CS skills in meaningful ways.

Our commitment to curriculum development and stakeholder feedback ensures that our CS program remains dynamic, relevant, and responsive to the evolving needs of our students and the broader community.

Practical Application through Service Learning

Building on our stakeholder feedback, we are focusing future efforts towards encouraging students to make use of our existing Service Learning program. This approach allows students to:

- Apply their CS skills in real-world contexts within the community
- Gain valuable experience that complements their classroom learning
- Develop a deeper understanding of how CS can be used to address real-world challenges

As this initiative evolves, the HS CS department continues to work closely with the Service Learning program to identify and create opportunities that allow students to maximize the practical application of their CS skills.