



Dominican International School

AP Computer Science Principles

SY: 2026-27

Grade Level 11/12
1 Year



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Description

As described by the [College Board](#), AP Computer Science Principles offers a multidisciplinary approach to teaching the underlying principles of computation. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. AP Computer Science Principles also gives students the opportunity to use current technologies to create computational artifacts for both self-expression and problem solving. Together, these aspects of the course make up a rigorous and rich curriculum that aims to broaden participation in computer science.

[CS50](#) is Harvard University's introduction to the intellectual enterprises of computer science and the art of programming for students with a diversity of technological background and experience. CS50 for AP Computer Science Principles is an adaptation of CS50 specifically tailored to align with the AP Computer Science Principles curriculum framework. The course assignments, materials, and resources are all identical to the version of the course taught at the college-level, albeit adapted to suit a secondary school audience.

This Syllabus has been adapted from the CS50 APCS pre approved syllabus CS50 submitted for approval to the College Board. Our course will adapt the original approved syllabus, with replacement of the CS50 C modules with CMU CS Academy's APCSP Python programming units and [Khan Academy's AP CSP](#) used as supplemental material for non programming units.

The Big Ideas and Thinking practices

Seven Big Ideas

Big Idea 1: Creativity
Big Idea 2: Abstraction
Big Idea 3: Data
Big Idea 4: Algorithms
Big Idea 5: Programming
Big Idea 6: The Internet

Six Computational Thinking Practices

P1: Connecting Computing
P2: Creating Computational Artifacts
P3: Abstracting
P4: Analyzing Problems and Artifacts
P5: Communicating
P6: Collaborating

Requirements

It is recommended that a student in the AP Computer Science Principles course should have successfully completed a first year high school algebra course with a strong foundation on basic linear functions and composition of functions, and problem solving strategies that require multiple approaches and collaborative efforts. In addition, students should be able to use a Cartesian (x, y) coordinate system to represent points in a plane. It is important that students and their advisers understand that any significant computer science course builds upon a foundation of mathematical and computational reasoning that will be applied throughout the study of the course. [AP Computer Science Principles Course Overview](#)

How this course can benefit students

Among this course's objectives is to supply students with a comprehensive introduction to the fundamentals of the discipline of computer science. We will do so using programming in several different languages as a vehicle to introduce these fundamentals, including such topics as algorithms, abstraction, data, global impact, and internet technologies. Though the course is programming-heavy, it should be stressed that this is not a "programming course"; rather, this course should be considered one of problem-solving, creativity, and exploration. By year's end, students will have a richer understanding of the key principles of the discipline of computer science. They will be able to speak intelligently about how computers work and how they enable us to become better problem-solvers, and will hopefully be able to communicate that knowledge to others.

Primary Textbook and Other Resources

Books and Online Instructional Material

- [CS50 Reference](#)
- [Kahn AP® Computer Science Principles Review](#)
- [CS50 AP](#)

Videos

- [Code.org Video library](#) Topical Videos
- [This is CS50 Youtube.com](#) Lectures, seminars, shorts and walkthroughs
- [PBS Crash Course Computer Science](#)

Programming Environment

- [Visual Studio Code for CS50](#)

Assessment

Assignments 30%

Quizzes 30%
Quarter Exam 30%
Department 10 %

Additional Information:

Course Structure and Schedule

This course spans four quarters, providing approximately 34 weeks of instruction prior to the AP exams. Classes are held in the school's computer lab, except on days when students participate in offline activities. Students meet five times per week for 45-minute periods, organized into two double-block sessions and one single session each week. Most topics are covered over a two-week period. After the AP exam, class time will be dedicated to enrichment activities and project-based work.

Each unit includes graded activities and labs, followed by a unit test. At the end of each quarter, students will take a cumulative final exam covering all material taught up to that point.

Instructional Approach

Students typically begin each unit with the expectation that students have already viewed the CS50 lecture video. In class, instruction follows the "I do, we do, you do" model, providing opportunities for direct instruction, guided practice, and independent work. This structure supports frequent student engagement and question-asking.

Students who demonstrate proficiency in a topic are encouraged to move ahead and to assist their peers as informal teaching assistants, helping others through common challenges.

Subsequent class sessions feature "Section"-style reviews, where students explore topic blocks in greater detail through instructor demonstrations and code-along activities. Students then work in pairs on a Lab assignment~an intermediate-sized project that reinforces key concepts with teacher support.

Each unit concludes with two individual assessments:

- A **Problem Set (PSET)**: an individual programming assignment
- A **Unit Exam**: testing understanding of all topics in the unit

Curricular Alignment

This syllabus has been adapted from the [AP CS50 Syllabus](#) to better suit our students' backgrounds and the structure of our academic calendar.

AP CS P Exam

Students who complete this course will be prepared to take the AP CS P Exam in May.

Submission Alignment with the TORCH Values

In this course, earning an exemplary level score 9 or 10 out of 10 for example is about the learning process as much as the final product. You do not need to be perfect at everything every day, but an exemplary submission requires demonstrating consistent, aspirational effort in all of our school's TORCH values on any given assignment:

- **Truthful:** Your work is authentically yours, you provide evidence of the steps you took in your process and you are honest about your progress and where you are struggling.
- **Organized:** You manage your time effectively, bring required materials, and meet deadlines. You are proactive and make an extension request before the due date
- **Reflective:** You use the TEEL or another suitable method in your responses. When asked about your work you are able to verbally explain how you arrived at an answer, not just what the answer is.
- **Courageous:** You take intellectual risks, speak up in discussions, and aren't afraid to make mistakes during the learning process.
- **Helpful:** You actively support your peers and contribute to a positive, collaborative classroom environment.

In assessments, I look for evidence that you are striving toward these ideals. At the end of our lessons, you will complete a brief reflection in your lesson worksheets to highlight which of these values you practiced and which you need to improve upon.

Class Expectations and Policies

Be Ready to Learn

- Arrive on time and prepared. The first 10 minutes of class are critical~avoid leaving during this time unless urgent.
- Maintain a positive attitude and actively engage to maximize your growth and success.

Be Respectful

- Show respect for yourself, classmates, teachers, and the learning environment.
- Actively listen and participate constructively in discussions and group work.

Be Responsible

- Complete assignments with your best effort. Incomplete or unsatisfactory work must be revised and resubmitted.
- Assignments must be submitted on the due date:
 - Seatwork: typically due the same day assigned.
 - Multi-class assignments: due on the final designated in-class workday.

Late Work Policy

- 1 day late: Maximum score of 60%.
- More than 1 day late: Maximum score remains 60%; enrollment in Project I for structured support.
- All assignments must be satisfactorily completed, regardless of lateness or initial score.

Absences and Assessments

- If absent, it's your responsibility to check missed work and submit assignments the day after returning unless other arrangements are approved.
- Missed quizzes without valid reasons and parent/guardian communication result in a zero grade.

Additional Classroom Rules

- Follow standard school rules and behavior expectations.
- Speak English only during class to ensure inclusive communication.
- Keep your seating area and classroom tidy.
- No eating or drinking in ICT labs.
- Request permission before leaving the classroom.

Academic Honesty (Plagiarism)

HS Computer Science follows the Harvard CS academic honesty guidelines:

“The essence of all work you submit must be your own. Collaboration is not permitted unless explicitly stated. You may ask classmates or use AI tools (such as chatbots) for guidance, provided this support does not equate to others or the AI doing your work for you. You may show your work to others when seeking help but may not view their work, respecting all other constraints of this policy.”

Detailed guidelines: [Syllabus - CS50 AP](#)

WEEKLY SCHEDULE

Week/Date	Topic/Projects/Assessments
Week 1 Aug 10 - 14	Monday No Students ~ Class Preparation Tuesday Morning Assembly U6: The Fabric of the Internet and AI Planning description: Explains how the Internet moves data through bits, addresses, routers, packets, redundancy, HTTP, DNS, the Web, network security, and emerging technologies. U6 Lo1 U3 Pre-Assessment U6 Lo2 Introduction to the Internet

	U6 Lo3 Sending Bits U6 Lo4 IP Addresses Friday Mass
Week 2 Aug 17 - 21	U6 Lo5 The ingredients of the Internet U6 Lo6 Routers and Redundancy U6 Lo7 Packets U6 Lo8 Redundancy and fault tolerance U6 Lo9 Topic 4.2 set: Fault Tolerance (6 MCQs) Q1 Quiz 1 U6 L10 HTTP and DNS
Week 3 Aug 24 - 28	U6 L11 The World Wide Web U6 L12 Topic 4.1 set: The Internet (3 MCQs) Q1 Quiz 2 U6 L10 HTTP and DNS U6 L11 The World Wide Web U6 L12 Topic 4.1 set: The Internet (3 MCQs) Q1 Quiz 3
Week 4 Aug 31 - Sep 4	U1 ~ The Impact of Computing Planning description: Examines how computing innovations affect people and societies, including unequal access, bias, crowdsourcing, and legal and ethical concerns, anchored by an Internet-access advocacy project. U1 Lo1 The Internet's Hidden Barriers U1 Lo2 Internet Access Advocacy Campaign Project U1 Lo3 The global digital divide U1 Lo4 Topic 5.2 set: Digital Divide (3 MCQs) Q1 Quiz 4 U1 L05 Computing Bias
Week 5 Sep 7 - 11	U1 Lo6 Crowdsourcing U1 Lo7 Legal and Ethical Concerns U6 ~ The Fabric of the Internet and AI (continued) Planning description: Explains how the Internet moves data through bits, addresses, routers, packets, redundancy, HTTP, DNS, the Web, network security, and emerging technologies. U6 L13 Network Security U6 L14 Emerging Technologies U6 L15 Network Security Risk Assessment Project U6 L16 U3 End of Unit Assessment Q1 Quiz 5

Week 6 Sep 14 - 18	U7 ~ Cybersecurity, AI-Powered Threats and Defenses Planning description: Examines cybersecurity threats and defenses, including phishing, malware, authentication, encryption, layered security, AI-enabled attacks, and security–usability trade-offs. U7 L01 U4 Pre-Assessment U7 L02 Introduction to Cybersecurity U7 L03 Cybersecurity Threats U7 L04 Phishing and Password Attacks U7 L05 Phishing with AI U7 L06 Successful Cybersecurity Stories
Week 7 Sep 21 - 25	T-W-Th Pre-Exam Days U7 L07 Computer malware U7 L08 Topic 5.6 selected set: phishing, malware, privacy, MFA U7 L09 Confidentiality, Integrity, and Availability U7 L10 Authentication, Authorization, and Accounting U7 L11 AAA and AI Q1 Final Exam Friday Moon Festival ~Public Holiday
Week 8 Sep 28 - Oct 2	Monday Confucius' Birthday ~Public Holiday Tuesday Regular Schedule Wednesday Regular Schedule Thursday Major Exams Day 1 Friday Major Exams Day 2
Week 9 Oct 5 - 9	Monday No Students ~ Record Day T-W-Th No Students ~ Teachers Conference Friday Double 10 Day ~ Public Holiday

2nd QUARTER – TENTATIVE COURSE CONTENT

Week/Date	Topic/Projects/Assessments
Week 1 (10) Oct 12 - 16	U7 ~ Cybersecurity, AI-Powered Threats and Defenses Continued U7 L12 Encryption U7 L13 AI in Encryption U7 L14 Security vs Usability U7 L15 Layered Defenses U7 L16 Designing Secure Systems Project U7 L17 Topic 5.6 remaining selected questions: safe computing U7 L18 U4 End of Unit Assessment

	Q2 Quiz 1
Week 2 (11) Oct 19 - 23	U2 ~ Programming in Python Planning description: Develops the programming spine through Python functions, variables, conditionals, loops, lists, libraries, testing, and file I/O, then closes with bounded Create-readiness practice. U2 L01 Getting Started with Python ~ Diagnostic and Practice: Hello U2 L02 Functions and Variables ~ Topic and Guided Practice U2 L03 Functions, Strings, and Output ~ Practice: Indoor Voice + Playback Speed U2 L04 Functions, Variables, and Arithmetic ~ Lab: Tip Calculator U2 L05 Conditionals ~ Topic and Guided Practice U2 L06 Conditionals ~ Practice: Home Federal Savings Bank
Week 3 (12) Oct 26 - 30	Monday Retrocession Day ~ Public Holiday U2 L07 Conditionals ~ Transfer Lab: Bank U2 L08 Loops ~ Topic and Guided Practice U2 L09 String Iteration ~ Practice: Just Setting Up My Twttr U2 L10 Nested Loops ~ PSET: Mario (Choose Less or More Comfortable) U2 L11 Conditionals and Loops ~ Cumulative PSET: Cash Q2 Quiz 2
Week 4 (13) Nov 2 - 6	U2 L12 Conditionals and Loops ~ Cumulative PSET: Credit U2 L13 Algorithms and Strings ~ Cumulative PSET: Readability U2 L14 Exceptions and Input Validation ~ Topic and Guided Practice U2 L15 Exceptions and Validation ~ Practice: Fuel Gauge U2 L16 Dictionaries and Exceptions ~ Lab: Taqueria U2 L17 Lists and Dictionaries ~ Lab: Grocery List Q2 Quiz 3
Week 5 (14) Nov 9 - 13	U2 L18 Libraries and Modules ~ Topic and Guided Practice U2 L19 Libraries and Command-Line Arguments ~ Practice: FIGlet U2 L20 Libraries and External Data ~ Lab: Seven Day Average U2 L21 Unit Testing ~ Topic and Guided Practice U2 L22 Unit Testing ~ Practice: Testing My Twttr Q2 Quiz 4
Week 6 (15) Nov 16 - 20	U2 L23 File I/O ~ Topic and Guided Practice U2 L24 Reading CSV Data ~ Practice: Pizza Py U2 L25 Transforming CSV Data ~ Lab: Scourgify U2 L26 Files, Lists, and Data Processing ~ Cumulative PSET: DNA
Week 7 (16) Nov 23 - 27	T-W-Th Pre-Exam Days U2 L27 Files, Dictionaries, and Data Processing ~ Cumulative PSET: World Cup College Board Create Task Preparation Prepare Part 1: Review the Task

	Q2 Final Exam Friday Grade 12 Exams
Week 8 (17) Nov 30 - Dec 4	Monday Grade 12 Exams Prepare Part 2: Deep Dive Prepare Part 3: Make a Plan
Week 9 (18) Dec 7 - Dec 11	Monday TBD Tuesday Foundation Day Mass 9:00, Cutting of the Cake Ceremony, Christmas Fair, (Whole day) Wednesday TBD Thursday Major Final Exams half day Friday Major Final Exams half day
<i>Dec 15 to Jan 2 Christmas Break</i>	

3rd QUARTER – TENTATIVE COURSE CONTENT

Week/Date	Topic/Projects/Assessments
Week 1 (19) Jan 1 - Jan 8	Monday No Students ~ Record Day Friday New Year Mass at 8:00 College Board Create Task - Performance Make CT: Code Development - Part 1 CT: Code Development - Part 2 CT: Code Development - Part 3 CT: Code Development - Part 4 CT: Code Development - Part 5
Week 2 (20) Jan 11 - Jan 15	CT: Review and Refactor - Part 1 CT: Review and Refactor - Part 2 CT: Documentation - Written Responses Part 1 CT: Documentation - Written Responses Part 2 CT: Documentation - Video Part 1 CT: Documentation - Video Part 2
Week 3 (21) Jan 18 - Jan 22	CT: Final Review and Submission CT: Presentation Preparation CT: Final Presentation

Week 4 (22) Jan 25 - Jan 29	U4 ~ SQL and Data Science Planning description: Builds relational-data reasoning and SQL fluency through queries, multi-table investigations, data ethics, and communication of defensible findings. U4 Lo1 SQL Foundations: Favorites U4 Lo2 Relational Data and Schema Reasoning: Hall of Prophecy U4 Lo3 Songs Lab U4 Lo4 Movies Investigation Parts 1–3 Q3 Quiz 1
Week 5 (23) Feb 1 - Feb 5	U4 Lo5 Fiftyville Investigation Parts 1–4 U4 Lo6 Data Ethics, Privacy, and Bias in Queries Thursday Little New Year's Eve Public Holiday Friday Lunar New Year Public Holiday
<i>February 8 to 12 Chinese New Year Holiday</i>	
Week 6 (24) Feb 15 - Feb 19	U5 ~ Application Development Planning description: Builds user-facing applications with HTML, CSS, JavaScript, Flask, forms, templates, SQLite, accessibility, security, and responsible data handling. U5 Lo1 Web Development U5 Lo2 Radio Shack Redo U5 Lo3 Trivia Lab U5 Lo4 Homepage U5 Lo5 Hello, Flask Q3 Quiz 2
Week 7 (25) Feb 22 - Feb 26	22-26 ~ IOWA Assessments U5 Lo6 Birthdays U5 Lo7 Finance
Week 8 (26) Mar 1 - Mar 5	Monday Memorial Day Public Holiday T-W-Th ~ Pre-Exam Days
Week 9 (27) Mar 8 - Mar 12	Q3 Final Exam

Week 10 (28) Mar 15 - Mar 19	8 ~ Final Project Planning description: Guides an interest-driven capstone from problem selection and proposal through prototyping, user testing, refinement, responsible-AI review, showcase, and reflection. U8 Lo1 Final Project Launch and Exemplars U8 Lo2 Problem Selection and Audience Research U8 Lo3 Proposal, Success Criteria, and Scope U8 Lo4 Design and Technical Architecture Q4 QUIZ 1 MOCK PRACTICE EXAM
Week 11 (29) Mar 22- Mar 26	Tuesday Major Final Exams half day Wednesday Major Final Exams half day Thurs - Fri Easter Break (Spring Break)
<i>March 25 to April 2 Easter & Spring Break</i>	

4th QUARTER – TENTATIVE COURSE CONTENT

Week/Date	Topic/Projects/Assessments
Week 1 (30) Apr 5 - Apr 9	Monday Tomb Sweeping Day Public Holiday Tuesday Children's Day Public Holiday U8 Lo5 Prototype Build Sprint U8 Lo6 User Testing and Feedback U8 Lo7 Refinement Build Sprint Q4 QUIZ 2 MOCK PRACTICE EXAM
Week 2 (31) Apr 12 - Apr 16	U8 Lo8 Responsible AI and Provenance Audit U8 Lo9 Accessibility, Reliability, and Polish U8 L10 Showcase Preparation U8 L11 Final Project Showcase U8 L12 Reflection and Portfolio Capture Q4 QUIZ 2 MOCK PRACTICE EXAM
Week 3 (32) Apr 19 - Apr 23	19 - 23 AP Mock Exams Once the schedule is set for students and their schedules with other AP Classes are understood, the AP review schedule will be shared for the remaining classes.
Week 4 (33) Apr 26 - Apr 30	T-W-Th Pre-Exam Days Friday Labor Day ~ Public Holiday
Week 5 (34) May 3 - May 7	3 - 7 Final Exams (K, Gr. 5, 8, & 12 Only) 3 - 14 AP Exams
Week 6 (35) May 10 - May 14	3 - 14 AP Exams Wednesday Major Final Exams Undergraduates half day

	Thursday Major Final Exams Undergraduates half day Friday Record Day ~ Student Holiday
Week 7 (36) May 17 - May 21	Monday Gr. 12 Recollection (Morning) Monday Baccalaureate Mass (Afternoon, Schoolwide) Wednesday House Sports Day Thursday High School Field Trip Friday House Culminating Activity All Week Student Clearance Days & Special Events
Week 8 (37) May 24 - May 28	Monday Middle & High School Sports Day Monday LS Field Trip Tuesday Kindergarten Graduation/Gr. 5 Promotion Wednesday Gr. 8 Graduation and Gr. 12 Graduation Thursday Pre-Kindergarten & Gr. 1 - 4, 6 & 7, 9-11 Recognition Friday Last Day of School for Students
	Special Events

“Kindling the Light of Faith, Hope, and Love: The Legacy of St. Dominic de Guzmán”

High School Computer Science Sequence 2026–2027

The table below outlines the High School Computer Science pathways available at DIST.

Classes are 40 minutes long, and most students should be able to complete the core lesson activities during class. Students who need additional practice, review, or support may occasionally require about 15-25 minutes outside class to satisfactorily complete the activities.

Students who wish to develop deeper mastery may choose to spend more time on enrichment activities included within or added to the lessons. These activities are not required for the course grade, but they provide valuable opportunities for additional practice, self-assessment, and further exploration.

A student’s effort and engagement will strongly influence their growth in computer science. Although completing enrichment activities does not automatically result in a higher grade, it can help students build stronger skills, greater confidence, and a deeper understanding of the course content.

Subject CS Sequence	
Grade 9 CS AI & Computing	Grade 10 CS Discoveries: Design & Data
CodeAI: AI Discoveries (AID) Unit 1 - Thinking Critically About AI Unit 2 - AI and Machine Learning Unit 4b - Interactive Animations and Games	CodeAI: AI Discoveries (AID) Unit 5 - The Design Process Unit 6 - Data and Society
G11 CS Exploring AI Foundations	G12 CS Building AI Foundations
CodeAI: AI Foundations Unit 1: Problem Solving with AI Unit 2: AI and the Systems That Power It Unit 5: Insights from Data and AI	CodeAI: AI Foundations Unit 6: AI-Generated Design Unit 7: AI and Algorithmic Decisions Unit 8: Building Data-Driven Systems with AI

AP CS Sequence	
G11 APCS A JAVA	G12 APCS Principles
CSAwesome AP Computer Science A is an introductory college-level computer science course. Students cultivate their understanding of coding through analyzing, writing, and testing code as they explore concepts like modularity, variables, and control structures. Unit 1: Using Objects and Methods Unit 2: Selection and Iteration Unit 3: Class Creation Unit 4: Data Collections Unit 5: Review & AP Exam Preparation	CS5oAP , CS5oPython, CodeAI: AI Foundations (AIF) AP Computer Science Principles introduces students to the breadth of the field of computer science. In this course, students will learn to design and evaluate solutions and to apply computer science to solve problems through the development of algorithms and programs. Unit 1: The impact of Computing Unit 2: Programming in Python Unit 3: Create Task Unit 4: SQL and Data Science Unit 5: Application Development Unit 6: The Fabric of the Internet and AI Unit 7: Cybersecurity, AI-Powered Threats and Defenses Unit 8: Final Project Unit 9: Review & AP Exam Preparation

High School CS Curriculum Overview

CS50AP as the AP CS Capstone

For students in the AP CS Pathway, CS50AP serves as the Grade 12 capstone following AP Computer Science A in Grade 11. It builds on students' Java programming experience while broadening their understanding of computer science through Python, databases, web development, cybersecurity, artificial intelligence, and the social impact of computing.

Beginning in 2026–2027, C was removed from the AP Computer Science Principles course. This provides more time for other parts of the curriculum and allows students to begin with Python at a higher level of abstraction. Students can therefore spend more time designing, building, and refining realistic applications rather than managing lower-level programming details.

Practical Application through Service Learning

Students in both the Subject CS Pathway and AP CS Pathway are encouraged to apply their knowledge through the school's Service Learning program.

The High School Computer Science department collaborates with Service Learning staff to help students identify opportunities to:

- Apply computer science skills in authentic community contexts
- Develop solutions for real users and needs
- Gain practical experience beyond the classroom
- Strengthen collaboration, communication, and project-management skills
- Understand how technology can be used to address real-world challenges

These experiences complement classroom learning and provide meaningful opportunities for students to demonstrate the practical value of their computer science knowledge.

Curriculum Review and Development

The High School Computer Science curriculum is reviewed regularly to ensure that it remains current, appropriately challenging, and responsive to student needs, academic expectations, and changes in technology.

Curriculum Evaluation

Potential additions and revisions are evaluated through classroom trials, student outcomes, teacher reflection, and stakeholder feedback. Previous trials have included CS50 SQL and Carnegie Mellon University college-level programming materials.

These evaluations showed that the existing AP CS Pathway provides substantial breadth, depth, and academic rigor while maintaining flexibility to adapt to evolving technologies and student interests.

This supports a focused curriculum that allows students sufficient time to develop, apply, and reflect on the skills necessary for further study, future careers, and real-world problem solving.

Stakeholder Feedback

Feedback is encouraged from students, parents, alumni, teachers, administrators, and industry professionals. This helps ensure that the curriculum remains aligned with academic standards, university pathways, and practical applications of computer science.

Adaptive Planning and Collaboration

The curriculum continues to evolve in response to new technologies, student interests, and stakeholder input. Collaboration with the Service Learning program provides a practical way to connect classroom learning with industry-related skills and community engagement without unnecessarily adding further course content.

Through ongoing evaluation and collaboration, the High School Computer Science program aims to remain coherent, relevant, and sustainable while preparing students for further study, future careers, and responsible participation in a technology-rich society.