

# 4565: Computing Foundations for a Digital Age

## Unit 5

### Ethical and Social Implications of Computing

#### Unit Length: 9–10 days

---

#### **Unit Introduction**

What makes a technology “good” or “fair”? In this unit, students dive into the ethical and social issues surrounding computing—from AI and privacy to accessibility and intellectual property. Through case studies, debates, simulations, and a capstone project, students will develop critical thinking and awareness around how technology impacts people, society, and the world.

---

#### **Unit Objective**

Students will evaluate the ethical, legal, and social implications of computing technologies, using evidence and reasoning to form personal stances and propose responsible solutions.

---

#### **Word Bytes (Vocabulary)**

- Ethics – A system of moral principles that guide decisions about right and wrong
- Unintended Consequences – Outcomes of a decision or action that weren’t expected or planned
- Ethical Dilemma – A situation where a decision must be made between two conflicting moral principles
- Algorithm – A step-by-step procedure used to solve a problem or make a decision
- Artificial Intelligence (AI) – A technology that allows machines to mimic human intelligence
- Machine Learning – A type of AI that learns from data to make predictions or decisions
- Input – Data or information entered into a system for processing
- Output – The result produced by a computer after processing input

- Bias – A preference or prejudice in data or algorithms that can lead to unfair outcomes
- Training Data – Data used to teach an AI model how to make predictions
- Model – The mathematical representation of how an AI system understands data
- Prediction – The output of a model based on input data
- Usability – How easy and efficient a system is to use
- Accessibility – The design of products or services usable by people with diverse abilities
- Ergonomics – Designing for human comfort, safety, and efficiency
- Learnability – How easy it is for someone to learn to use a tool or system
- Inclusive Design – Designing systems so they can be used by as many people as possible
- Digital Divide – The gap between those with and without access to modern technology
- Net Neutrality – The principle that all internet traffic should be treated equally
- Misinformation – False or misleading information spread intentionally or accidentally
- Access – The ability to use or benefit from technology
- Consent – Permission given for something to happen, especially when sharing personal data
- Data Mining – Extracting useful patterns from large sets of data
- Implicit Data – Information collected without a user's direct input
- Explicit Data – Information a user knowingly shares
- Privacy Policy – A document explaining how a company collects and uses user data
- Copyright – Legal protection for original creative works
- Patent – Legal protection for inventions or technical ideas
- Intellectual Property (IP) – Creations of the mind, such as inventions, music, and software
- Fair Use – A limited legal exception allowing use of copyrighted content without permission
- Plagiarism – Using someone else's work without giving credit

- Automation – Technology that performs tasks without human input
  - Trade-off – A balance achieved between two desirable but conflicting outcomes
  - Ethical Implication – A possible effect of a decision or action on moral or ethical grounds
  - Transparency – Openness about how something works or is being used
- 

## Daily Breakdown

### Day 1: What Is Ethics in Tech?

Objective: Students will define ethics and explore why ethics matter in computing.

Activities:

- Warm-up: “Would You Rather?” prompts
- Read and analyze real-world headlines
- Discuss ethical dilemmas in tech
- Exit Ticket: Reflect on a personal tech-related ethical decision
- Project: Brainstorm technologies with ethical implications

### Day 2: Traditional vs. AI/ML Algorithms

Objective: Students will compare traditional algorithms with AI/ML.

Activities:

- Warm-up: Match tech tools to algorithm types
- Mini-lesson: Traditional vs. ML algorithms
- Group sort: Label examples as traditional or AI/ML
- Exit Ticket: Advantage and drawback of AI/ML
- Project: Begin case study topic selection

### Day 3: How Does AI Learn? + Ethics

Objective: Students will explore how machine learning models are trained and identify risks.

Activities:

- Warm-up: What does it mean to “teach” a computer?
- Use Teachable Machine or similar sandbox
- Discuss data bias and responsibility
- Exit Ticket: Who’s responsible when AI makes a mistake?
- Project: Finalize topic and begin research

**Day 4: Usability, Ergonomics, and Accessibility**

Objective: Students will evaluate inclusive and accessible design.

Activities:

- Warm-up: Share a personal tech usability frustration
- Station Rotation: Usability checklist review of real tools
- Debrief: What made a tool usable or not?
- Exit Ticket: Suggest a design improvement
- Project: Review accessibility in chosen tech

**Day 5: The Internet's Impact on Society**

Objective: Students will analyze how the internet has shaped society positively and negatively.

Activities:

- Warm-up: Agree/disagree line activity
- Mini-lesson: Digital divide, net neutrality
- WebQuest: Misinformation, activism, education
- Exit Ticket: Personal reflection on internet impact
- Project: Analyze internet's role in chosen tech

**Day 6: Data Privacy and Consent**

Objective: Students will understand how user data is collected and the importance of consent.

Activities:

- Warm-up: App permission poll
- Explore app settings and privacy policies
- Case study: Track a fictional person's data
- Exit Ticket: Suggest a privacy improvement
- Project: Document privacy implications

**Day 7: Copyright, Patents, and IP**

Objective: Students will explain the legal protection of creative and technological work.

Activities:

- Warm-up: Quiz – Can I remix this?
- Remix Challenge: Meme, lyric, or image
- Small group discussion: Should all digital work be protected?
- Exit Ticket: What surprised you about copyright laws?
- Project: Explore legal considerations

**Day 8: Ethical Trade-Offs in Computing**

Objective: Students will weigh the pros and cons of emerging technologies.

Activities:

- Warm-up: Would you use a self-driving car?
- T-Chart: Compare pros and cons of 3 technologies
- Debate: Which tech has the toughest trade-offs?

- Exit Ticket: Your personal stance
- Project: Finalize ethical analysis

#### Day 9: Ethical Tech Symposium

Objective: Students will present and evaluate peer projects.

Activities:

- Set up: Digital or physical showcase
- Gallery walk or presentations
- Peer reviews using rubric
- Exit Ticket: What changed your perspective?
- Project: Submit final product

#### Day 10 (Optional): Reflection & Real-World Ethics

Objective: Students will reflect on ethics in daily technology use.

Activities:

- Warm-up: Rank daily tech from most to least ethical
- Socratic Seminar: What is ethical tech?
- Reflective writing: Future implications of what they learned
- Exit Ticket: One behavior they will change