

15.0000 Engineering, General (2011)

Knowledge	Skills	Performance Element	
			Technical Standards - Michigan Customized List
II			Engineering Ethics
	A		Demonstrate an understanding of the cultural, social, economic, and political consequences of engineering decisions
		1	Identify changes caused by the use of technology ranging from gradual to rapid and from subtle to obvious.
		2	Classify the use of technology involving weighing the trade-offs between the positive and the negative effects.
		3	Identify ethical considerations important in the development, selection, and use of technologies.
		a	Engineering bloopers
		b	Challenger explosion and risk analysis
		4	List the cultural, social, economic, and political changes caused by the transfer of a technology from one society to another.
	B		Demonstrate an understanding of the effects of technology on the environment
		1	Select technologies to conserve water, soil, and energy through such techniques as reusing, reducing and recycling.
		2	List trade-offs of developing technologies to reduce the use of resources.
		3	Identify technologies devised to reduce the negative consequences of other technologies.
		4	Discuss the implementation of technologies involving the weighing of trade-offs between predicted positive and negative effects on the environment.
	C		Demonstrate knowledge of constraints on global sustainability issues
		1	Recognize sustainability methods and materials
		2	Recognize the impact of engineering & technology on the environment
VIII			ETHICS AND LEGAL RESPONSIBILITIES: <i>Know and understand the importance of professional ethics and legal responsibilities.</i>

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	A			Develop the knowledge and abilities to comprehend ethical and legal standards as they apply to STEM where plans, processes, and projects will be dependent upon them.
		1		Demonstrate the skill of application to ethical and legal standards as they apply to the plans, processes, and projects as assigned in simulated environments.
			a	Evaluate the pros and cons of current ethical questions and scenarios, for example, environmental stewardship, genetic research, and living subjects in research.
			b	Comply with ethical standards and professional code of ethics.
			c	Follow legal requirements for the treatment of people in the workplace (ADA, EEO).
			d	Follow requirements of regulatory agencies in the scientific, and mathematics, engineering, or technology field (e.g., NFPA, OSHA, EPA, ADA, EOE, FCC).
			e	Develop personal ethics for real-life situations and experiences.
			f	Evaluate personal, professional, and organizational ethics.
			g	Explain fundamentals of patents, trademarks, copyrights, and proprietary information.
			h	Recognize and refute misleading information.
			i	Evaluate methods for protecting and conserving resources.
				Science, Technology, Engineering and Mathematics Cluster Essential Standards
VIII				ETHICS AND LEGAL RESPONSIBILITIES: <i>Know and understand the importance of professional ethics and legal responsibilities.</i>
	A			Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.
		1		Evaluate alternative responses to workplace situations based on legal responsibilities and employer policies.

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		2	Evaluate alternative responses to workplace situations based on personal or professional ethical responsibilities.
		3	Identify personal and long-term workplace consequences of unethical or illegal behaviors.
		4	Explain personal and long-term workplace consequences of unethical or illegal behaviors.
		5	Determine the most appropriate response to workplace situations based on legal and ethical considerations.
		6	Explain the most appropriate response to workplace situations based on legal and ethical considerations.
MICHIGAN CAREER AND EMPLOYABILITY STANDARDS			
I			APPLIED ACADEMIC SKILLS
	C		Ethical Behavior
		1	Demonstrate ethical behavior in school, work, and community situations.
		2	Describe employer-employee rights and responsibilities.
		3	Demonstrate appropriate behaviors necessary to maintaining employment.
		4	Demonstrate positive personal qualities as a group leader.
	E		Digital Citizenship – By the end of Grade 12 each student will:
		1	Identify legal and ethical issues related to the use of information and communication technologies (e.g., properly selecting and citing resources)
		2	Discuss possible long-range effects of unethical uses of technology (e.g., virus spreading, file pirating, hacking) on cultures and society
		3	Discuss and demonstrate proper netiquette in online communications
		4	Identify ways that individuals can protect their technology systems from unethical or unscrupulous users
		5	Create appropriate citations for resources when presenting research findings
		6	Discuss and adhere to fair use policies and copyright guidelines

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	F			Technology Operations and Concepts - By the end of Grade 12 each student will:
		8		Explain the differences between freeware, shareware, open source, and commercial software
		11		Understand and discuss how assistive technologies can benefit all individuals