Stevens Institute of Technology

Mechanical Engineering Program Outcomes: Relationship to ABET Criterion 3 (*a-k*)

Program Outcomes* *By the time of graduation, Mechanical Engineering students will have:*		**ABET Criterion 3 (*a-k*)**
I. Broad Based Technical Expertise		
Outcome 1	(*Scientific foundations*) the ability to use applied scientific knowledge *to solve problems in mechanical engineering and related fields*.	*a*
Outcome 2	(*Engineering foundations*) the ability to use fundamental engineering knowledge *to solve problems in mechanical engineering and related fields*.	*e*
Outcome 3	(*Experimentation*) the ability to design experiments, conduct experiments, and analyze experimental data *for mechanical engineering applications.*	*b*
Outcome 4	(*Technical design*) the technical ability to design a prescribed *mechanical or thermal* engineering process, device, or system.	*c*
Outcome 5	(*Design assessment*) The ability to develop and assess alternative *mechanical, manufacturing or thermal* system designs based on technical and non-technical criteria.	*c, h*
Outcome 6	(*Tools*) an ability to use the relevant tools necessary for *mechanical engineering and related practice*.	*k*
II. Professional Advancement and Communications		
Outcome 7	(*Professionalism*) the ability to recognize and achieve high levels of professionalism in their work.	*f*
Outcome 8	(*Leadership*) an ability to assume leadership roles.	*d*
Outcome 9	(*Teamwork*) the ability to function on teams.	*d*
Outcome 10	(*Communication*) the ability to communicate effectively and persuasively.	*g*
III. WorldView and Personal Development		
Outcome 11	(*Ethics and morals*) a critical understanding of ethical and moral systems in a social context.	*f*
Outcome 12	(*Contemporary and Social Issues*) a knowledge of contemporary and social issues in Mechanical Engineering and related fields.	*h, j*
Outcome 13	(*Lifelong learning*) a recognition of the need for and an ability to engage in lifelong learning and development.	*i*
Outcome 14	(*Entrepreneurship*) have a fundamental knowledge and an appreciation of the technology and business processes necessary to nurture new technologies from concept to commercialization.	--

Stevens Institute of Technology
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ME345 MODELING AND SIMULATION - COURSE OUTCOMES

Developed by: **Frank Fisher**
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Prog. Outcome	**COURSE OUTCOMES**
(2)	2-1. You are able to: (i) apply the Finite Element Method to assess stress, strain and deformation in a component and (ii) critically evaluate the model results via comparison to simplified analytical solutions
(2)	2-2. You are able to: (i) derive the state equation(s) for a mechanical system, (ii) use the state equations to determine the evolution of the system over time.
(4)	4-1. You are able to: (i) construct a CAE model for a given mechanical system and (ii) apply CAE simulation tools to evaluate, redesign and optimize a given mechanical system.
(5)	5-1. You are able to apply various CAE packages to: (i) create and manipulate parts and assemblies, (ii) evaluate the performance of the system, (iii) modify the system within the CAE environment, and (iv) assess the impact of design changes on the system performance.
(6)	6-1. You are able to: (i) select and (ii) use an appropriate CAE simulation tool applicable for mechanical system analysis.
(6)	6-2. You are able to critically interpret, analyze, and evaluate the results of a CAE model simulation
(6)	6-3. You are able to: (i) develop a strategy (psuedocode) for writing a computer program to solve a given problem, (ii) utilize elementary programming structures (for, while, and if statements) within the MATLAB programming environment, (iii) evaluate the accuracy of the coded solution
(10)	10-1. You are able to: (i) write a clear and concise technical memo summarizing the results of a CAE simulation and (ii) appropriately support the conclusions drawn from the simulation
(12)	12-1. You are able to describe how the contemporary practice of engineering has been impacted by the introduction of new engineering tools
(13)	13-1. You are able to independently use software tutorials and other self-study materials to learn how to utilize new engineering software tools