Table of Contents

Pre	ace	1	
1.	Planning for the future to improve mechanical engineering		
	education	1	
2.	What is needed from mechanical engineering education		
	in the future?	23	
	2.1 Early career engineers as stakeholders of mechanical engineering education	24	
	2.2 Employers as stakeholders of mechanical engineering education	28	
	2.3 Faculty as stakeholders of mechanical engineering education	29	
	2.4 Society as a stakeholder of mechanical engineering education	31	
3.	What are the target outcomes of mechanical engineering education?	37	
	3.1 Content mastery	39	
	3.2 Competency mastery	41	
	3.3 Systems competency	42	
	3.4 Sustainability competency	47	
	3.5 Ethics competency	52	
	3.6 Sustainability, systems and ethics competency development in		
	mechanical engineering	57	
4.	The future state of content & competency-based engineering		
	education: Lean Engineering Education	69	
	4.1 The definition and goals of engineering education	69	
	4.2 TheToyota education model	72	
	4.3 The definition of Lean Engineering Education	79	
	4.4 Systems competency mastery pulled by Lean		
	Engineering Education	81	
	4.5 Sustainability competency pulled by Lean Engineering Education	82	
	4.6 Ethics pulled by Lean Engineering Education	83	
5.	Examples of content & competency-based Lean Engineering Education	87	
Ref	rences	113	
Au	Author biographies 12		