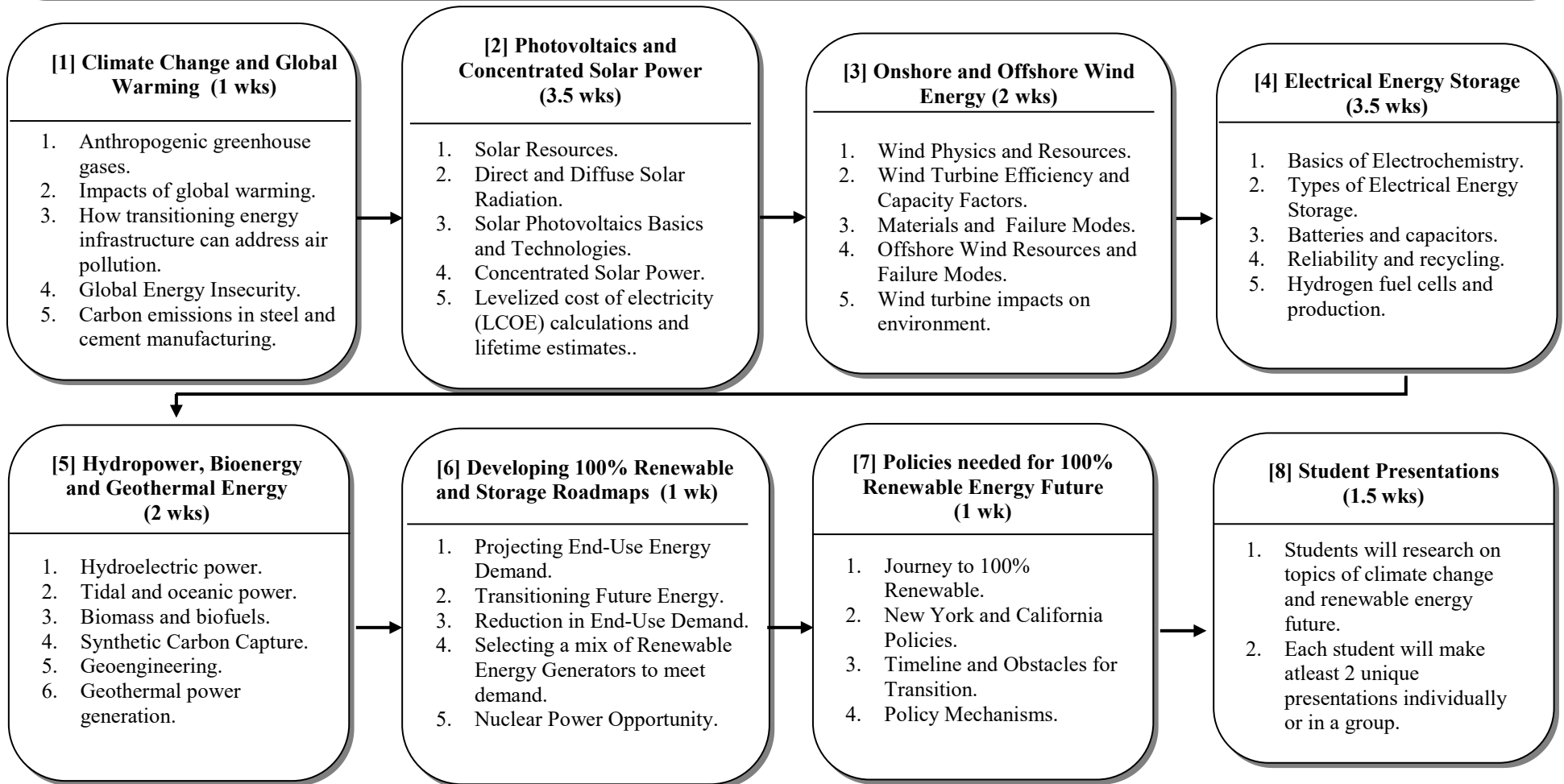


ME 49601
Renewable Energy Technologies

Course Outcomes

1. Understand and quantify world and U.S. energy needs. [1,2,6,7]
2. Understand scientific and socio-economic impacts of climate change, CO₂ and greenhouse gas emissions, carbon tax. [1,2,6]
3. Learn basic working principles of renewable energy technologies including solar, wind, hydropower, geothermal, bioenergy, fuel cells, energy storage. [1,2,4,6,7]
4. Learn state-of-art advancements, policy and cost of renewable energy and storage technologies. [1,2,4,6,7]
5. Develop teamwork skills, analysis of technical papers, and presentation skills. [3,4,5,7]



COURSE NUMBER: ME 49601		COURSE TITLE: Introduction to Renewable Energy Technologies	
REQUIRED COURSE OR ELECTIVE COURSE: Elective		TERMS OFFERED: Spring 2023.	
TEXTBOOK/REQUIRED MATERIAL: Introduction to Renewable Energy, Vaughn Nelson and Kenneth Starcher. CRC Press. ISBN-13: 978-1498701938.		PRE-REQUISITES:	
COORDINATING FACULTY: Shubhra Bansal		<ul style="list-style-type: none"> • Junior (or higher) level standing in an ABET approved Engineering Program 	
COURSE DESCRIPTION: This course provides an introduction to climate change and principles of renewable energy technologies. The course is a broad introduction of renewable energy technologies, working principles, materials, reliability, and cost analysis. The key topics to be covered in this course include climate change, solar energy technologies, wind power, bioenergy, geothermal, and energy storage. The course will primarily be lecture based. The students will make 2-3 presentations on the topics covered in the course.		COURSE OUTCOMES:	
ASSESSMENTS TOOLS:		<ol style="list-style-type: none"> 1. Understand design, materials and reliability of renewable energy systems, and components. [1,6,7] 2. Learn about challenges, cost and policy of climate change and renewable energy generation. [1,2,6] 3. Develop teamwork skills, analysis of technical papers, and presentation skills. [3,4,5,7] 4. Understand and quantify US and world energy needs and socio-economic impacts of climate change. [1,2,6,7] 	
PROFESSIONAL COMPONENT:			
Engineering Topics: Engineering Science – 1.5 credit (50%) Engineering Design – 1.5 credits (50%)			
NATURE OF DESIGN CONTENT:		RELATED ME PROGRAM OUTCOMES:	
<ul style="list-style-type: none"> • Understanding of connections between materials choice, power conversion efficiency, and failure modes for wind, solar, and other renewable technologies. • Understanding design, materials choices, reliability of electrochemical energy storage. 		<ol style="list-style-type: none"> 1. Engineering fundamentals 2. Engineering design 3. Communication skills 4. Teamwork skills 5. Analytical skills 6. Knowledge acquisition 7. Ethical/professional responsibilities 	
COMPUTER USAGE:			
<ul style="list-style-type: none"> • Course Material dissemination and student presentations. 			
COURSE STRUCTURE/SCHEDULE:			
<ul style="list-style-type: none"> • Lectures and discussions 			
PREPARED BY: Shubhra Bansal		REVISION DATE: June 21, 2022	