



# Partnership Between DEWA & UC Berkeley

# Excellence in Action



BIOENGINEERING



CHEMICAL



CIVIL



COMPUTER

ELECTRICAL



ENVIRONMENTAL



INDUSTRIAL



MATERIALS

MECHANICAL



NUCLEAR

# Driving Forces

## Highlights

229

*Current active engineering faculty*

72

*Faculty in National Academy of Engineering*

24

*Recipients of Distinguished Teacher Awards*

1,874

*Total degrees conferred in 2017*

4.50

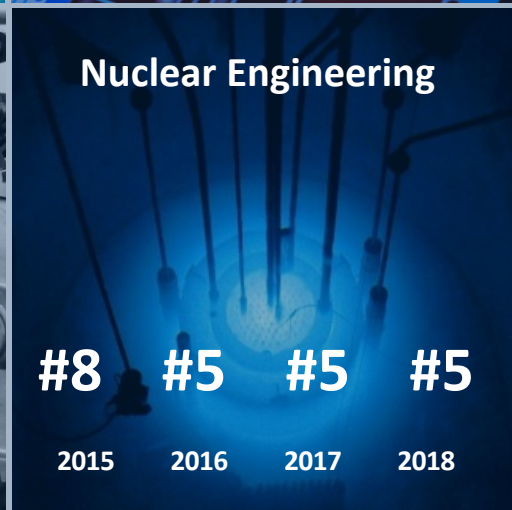
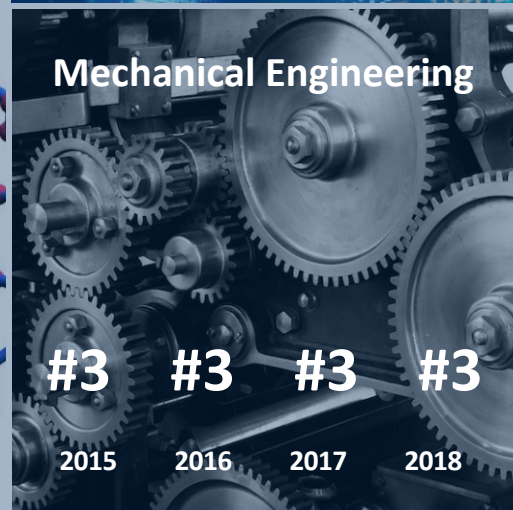
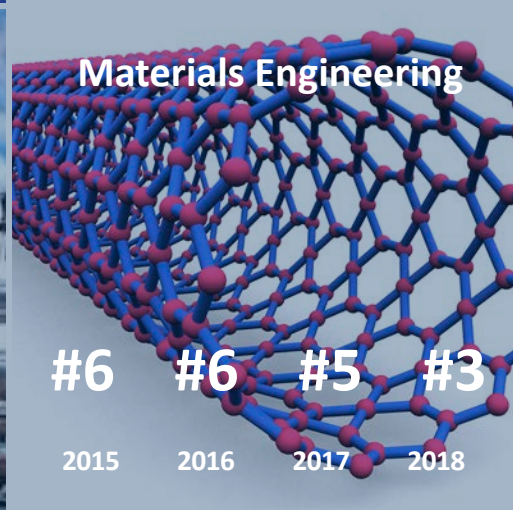
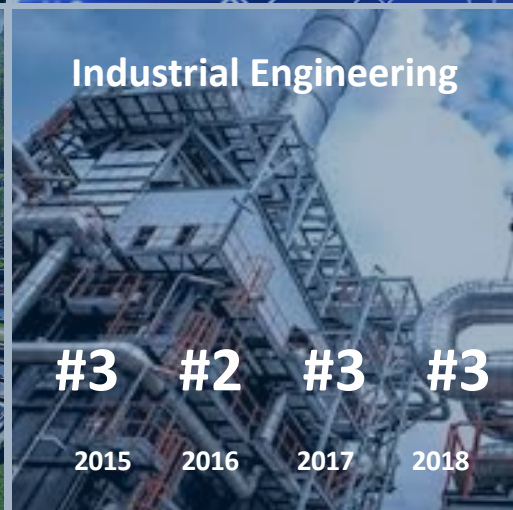
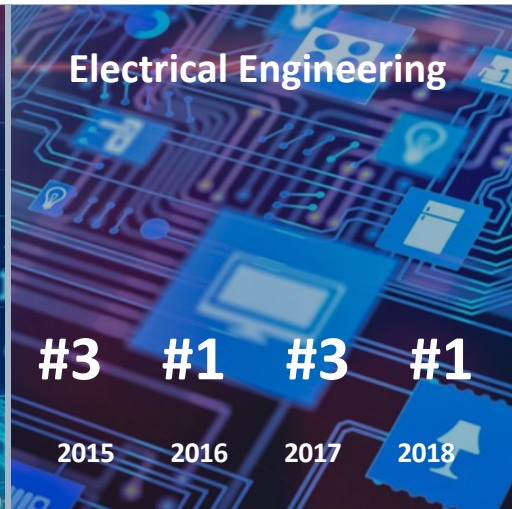
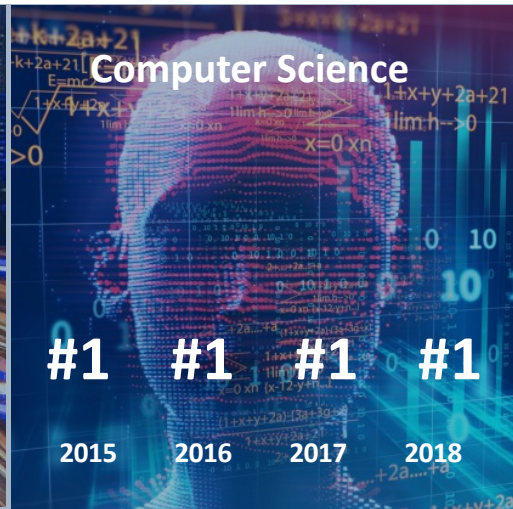
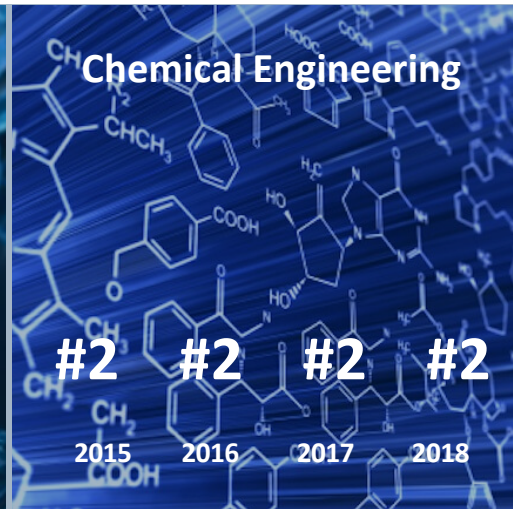
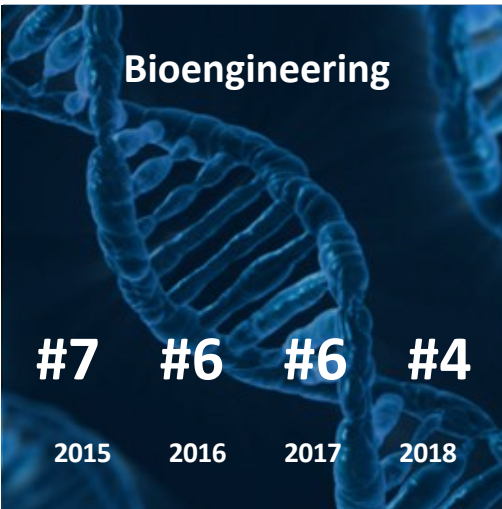
*Average GPA of accepted applicants*

9.6%

*Admit rate for freshman applicants*

# Engineering Program Rankings

While rankings never tell the full story, we are proud of our commitment to develop a world-class engineering program that equips students, faculty, and researchers with the tools to push the envelope in the scientific community.



# Relationship Team



**TSU-JAE KING LIU**  
*Dean, College of Engineering*



**WAYNE DELKER**  
*College of Engineering*



**TAREK ZOHD I**  
*Faculty Director*



**DIANA WU**  
*Dean, UC Berkeley Extension*



**PAUL MASON**  
*Relationship Manager*

# Our Expert Faculty



**Tarek I. Zohdi, Ph.D.**  
*Professor of Mechanical Engineering*



**Francesco Borrelli, Ph.D.**  
*Professor of Mechanical Engineering*



**Roberto Horowitz, Ph.D.**  
*Professor of Mechanical Engineering*



**Simo A. Mäkiharju, Ph.D.**  
*Assistant Professor of Mechanical Engineering*



**Khalid M. Mosalum, Ph.D.**  
*Professor of Civil Engineering*



**Mark Mueller, Ph.D.**  
*Assistant Professor of Mechanical Engineering*



**Kameshwar Poolla, Ph.D.**  
*Professor of Mechanical Engineering*



**Koushil Sreenath, Ph.D.**  
*Assistant Professor of Mechanical Engineering*

*\*UC Berkeley faculty are subject to change*

# June and January Session

JUNE						
S	M	T	W	T	F	S
	1	2	3	4	5	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

JANUARY						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

## PROGRAM DESCRIPTION

- 1 year program
- Students take 4 modules in June and 4 modules in January for a total of 8 modules plus seminar capstone(s) to earn their master's degree from DEWA Institute
- **Upon successful completion of the program each student earns a certificate and academic credit granted by UC Berkeley Extension**
- UC Berkeley faculty will be in Dubai for both the June and January sessions
- Each lecture will take place over 5 days, ~6 hours per day (total 30 hours per week)
- During the faculty's absence from Dubai – Graduate student instructors shall handle the learning for DEWA students
- In March/ April 2019, a program overview of the courses, orientation for students, preparatory course, etc. will be delivered in Dubai

## STUDENT EXPECTATIONS

- Technical undergraduate degree required
- Ability to be in class full day for lecture

# DEWA Student Experience



## Pre-Work

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Each module will begin with one week of pre-work that introduces foundational concepts and help students gain the requisite knowledge for that week's lecture

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Duration: 5 days, 3 hours per day  
Instructor: Graduate Student Instructor\*



## Lecture

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Faculty will lead "two-a-day" lectures that offer specialized training in emerging tech that allow students to capitalize on opportunities in an increasingly digitalized world

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Duration: 5 days, 6 hours per day  
Instructor: Faculty\*



## Seminar

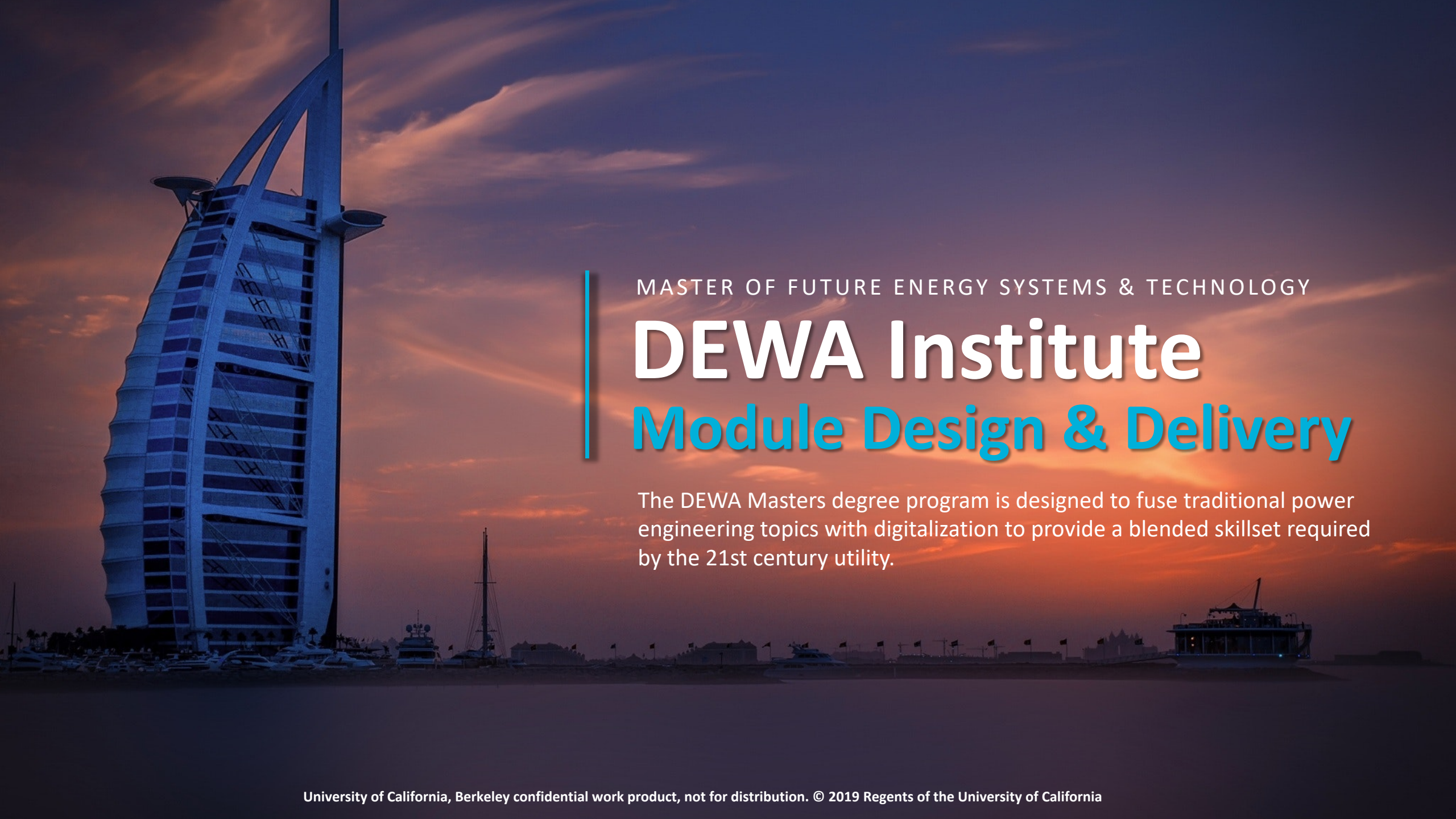
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The module will conclude with a one week seminar that will set expectations for the capstone project, review key concepts, and engage in real-life case studies and discussion

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Duration: 5 days, 3 hours per day  
Instructor: Graduate Student Instructor\*

\*Note: Faculty will only be on-site in Dubai for their week of lecture. Graduate Student Instructors will be present for the entirety of each Module.



MASTER OF FUTURE ENERGY SYSTEMS & TECHNOLOGY

# DEWA Institute

## Module Design & Delivery

The DEWA Masters degree program is designed to fuse traditional power engineering topics with digitalization to provide a blended skillset required by the 21st century utility.



# Degree Comparison

## UC Berkeley Masters in Engineering Program

The Berkeley Masters of Engineering Program curriculum integrates engineering coursework with classes in leadership and core management concepts. Students tackle industry challenges through case studies and their capstone project.

### Total Units

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**25**

*Units*

### Program Components

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- 4 technical courses
- 2 business courses
- 1 capstone project

## DEWA Institute Masters Program

The DEWA Institute Masters Program will closely mirror UC Berkeley's MEng curriculum and is designed with the express intent to deliver world-class energy and water education that focuses on building deep technical expertise required for real world application.

### Total Units

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**24**

*Units*

### Program Components

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- 8 technical courses
- Business concepts integrated throughout
- 8 micro-capstone projects

# Capstone Experience

*DEWA Institute participants will complete each module with a “Micro-Capstone Project” that will challenge students to integrate their technical skills to innovate in a dynamic, results-driven environment. Working in small teams, students will engineer solutions using cutting edge technology and methods to address needs within Dubai’s energy and water infrastructure.*

## Sample Micro-Capstone Projects Include:

- Energy Impact of Autonomous Vehicles
- Patent Analysis via Machine Learning
- Oscillating Wind Powered Devices

# Course Catalogue



## MODULE 1: Modeling & Simulation Tools for Industrial Applications

- 1-A: Modeling & Simulation Tools for Industrial Applications
- 1-B: Advanced Topics in Modeling & Simulation Tools for Industrial Applications



## MODULE 2: Modeling, Estimation, & Management of Traffic Road Networks

- 2-A: Advanced Control Systems
- 2-B: Modeling, Estimation, & Management of Traffic Road Networks



## MODULE 3: Flow of Power / Flow of Money in the 21<sup>st</sup> Century Power Grid

- 3-A: Flow of Power: Smart Grids, Renewable Integration, Microgrid Control, and Cybersecurity
- 3-B: Flow of Money: Power System Economics, Markets, & Demand Response



## MODULE 4: State Estimation, Autonomy, Machine Learning, & Energy Systems

- 4-A: State Estimation, Autonomy, Machine Learning, & Energy Systems
- 4-B: Advanced Topics in State Estimation, Autonomy, Machine Learning, & Energy Systems



## MODULE 5: Model Predictive Control for Energy Systems: From HVAC to Solar Power Plans

- 5-A: Model Predictive Control for Energy Systems: From HVAC to Solar Power Plans
- 5-B: Machine Learning & Predictive Control for Energy Systems: From HVAC to Solar Power Plans



## MODULE 6: Machine Learning, Robotics, and Control with Applications to Energy Systems

- 6-A: Machine Learning, Robotics, & Control w/ Applications to Energy Systems
- 6-B: Advanced Topics in Machine Learning, Robotics, and Control with Applications to Energy Systems



## MODULE 7: Resilience-Based Engineering: Cyber-Physical Design and Analysis of Smart Structural Systems

- 7-A: Resilience-Based Engineering: Cyber-Physical Design and Analysis of Smart Structural Systems
- 7-B: Advanced Topics Resilience-Based Engineering: Cyber-Physical Design and Analysis of Smart Structural Systems



## MODULE 8: Fluid Networks, Desalination, Diagnostics, & Energy Systems

- 8-A: Fluid Networks, Desalination, Diagnostics, & Energy Systems
- 8-B: Advanced Topics Fluid Networks, Desalination, Diagnostics, & Energy Systems