CALIFORNIA STATE UNIVERSITY
LONG BEACH
College of Engineering

2023
MAY 4-5

THE POINTE AT THE WALTER PYRAMID

SENIOR DESIGN PROJECT EXPO

College of Engineering
California State University, Long Beach



DEPARTMENTS

- Biomedical Engineering
- Civil Engineering and Construction Engineering Management
- Chemical Engineering
- Computer Engineering and Computer Science
- Electrical Engineering
- Mechanical and Aerospace Engineering

EDISON INTERNATIONAL
SWINERTON
SoCalGas
SUKUT CONSTRUCTION

MESSAGE FROM THE COE AFFILIATES PROGRAM CHAIR

As engineers, our role is to solve problems that address the needs of society and the welfare of humanity.

The impact of engineering, and specifically California State University, Long Beach Engineering, can be seen in what we achieve — the tangible results of our engineering teaching, research, and innovation. Today, we are celebrating a year-long achievement of our students and faculty in sharing those results with our community. Our industry partners, incoming freshmen, and high-school students join us today for the very first of our Senior Design Expo for the College of Engineering — with many more to come!

With the strong support of the College of Engineering, we present to you a rich and exciting program, consisting of student exhibits and competition, industry talks, poster presentations, outreach activities, and a social event.

I am grateful to share this celebration with all of you, and would like to thank our Dean Dr. Jinny Rhee, our faculty and students, and the entire College of Engineering Team for their continued dedication and efforts. I wish everyone a great time during the two-day program of the inaugural Senior Design Expo!



Dr. Emel Demircan

Dr. Emel Demircan
Chair, Engineering Corporate Affiliates

DEPARTMENT CHAIRS



Shadnaz Asgari
Biomedical Engineering



Mehrdad Aliasgari
Computer Engineering and Computer Science



Roger Lo
Chemical Engineering



Madhu Gupta
Electrical Engineering



Lisa Star
Civil Engineering and Construction Engineering Management



Jalal Torabzadeh
Mechanical and Aerospace Engineering

WELCOME FROM THE DEAN

It is my pleasure to welcome you to the inaugural Senior Design Project Expo for the College of Engineering!

This event is the culmination of a year of planning led by the chair of the Engineering Corporate Affiliates, Dr. Emel Demircan, in collaboration with the department chairs and senior project instructors. It is the hope that this event marks the start of a thriving ecosystem where our industry affiliates have access to our talented and ambitious engineering students, and our students have access to industry perspectives and the resources to tackle real-world challenges.

During this Expo, you will have the opportunity to see the amazing projects that our senior students have been working on this year. They have been challenged to push the boundaries of what is possible and to use their skills to make a positive impact on the world. As you explore the various projects on display, you will witness the results of their dedication and hard work.

I invite you to engage with our students, ask questions, and learn more about their projects. Your feedback and support will play a vital role in helping these students become the next generation of leaders in the field.

Thank you for joining us today, and please enjoy.

Go BEACH!



Dean Jinny Rhee

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EXPO SCHEDULE OF PRESENTATIONS
THURSDAY, MAY 4, 2023

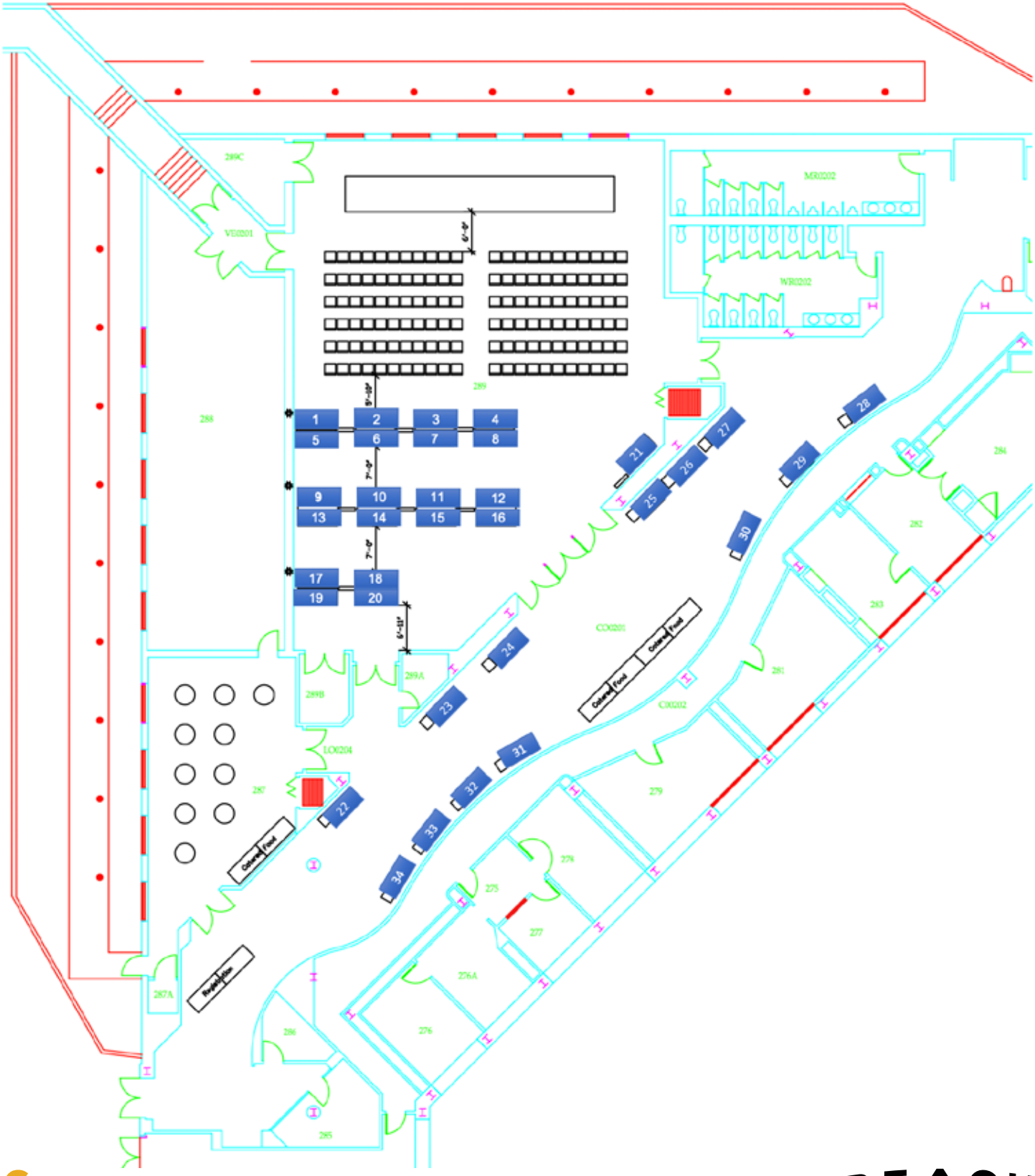
TIME	SESSIONS/ACTIVITY	LOCATION
1:00 - 1:15 PM	Welcome & Introduction (Dean COE)	Pacific Sunset Room
1:15 - 4:15 PM	**Mechanical and Aerospace Engineering** (Session Chairs: Roy, Yoozbashizadeh, Shankar)	
	Department Introduction (MAE Chair)	Pacific Sunset Room
	Senior Design Course Introduction (Instructors)	Pacific Sunset Room
	Student Projects Video	Pacific Sunset Room
	MAE Industry Talk	Pacific Sunset Room
	Student Demos, Competition, and Judging	Pacific Sunset Room and Hallway, Summit Room (Judging)
	MAE Awards Ceremony	Pacific Sunset Room
4:15 - 4:30 PM	Coffee Break & Metaverse Exhibit	Pacific Sunset Room
4:30 - 5:35 PM	**Civil Engineering and Construction Engineering Management** (Session Chairs: Star, Ko)	
	Department Introduction (CECEM Chair)	Pacific Sunset Room
	Senior Design Course Introduction (Instructors)	Pacific Sunset Room
	Student Demos, Competition, and Judging	Pacific Sunset Room
	CECEM Awards Ceremony	Pacific Sunset Room
5:35 - 5:50 PM	Coffee Break	Pacific Sunset Room
5:50 - 6:50 PM	**Chemical Engineering** (Session Chairs: Lo, Wilson)	
	Department Introduction (CHE Chair)	Pacific Sunset Room
	Senior Design Course Introduction (Instructors)	Pacific Sunset Room
	Student Demos, Competition, and Judging	Pacific Sunset Room
	CHE Awards Ceremony	Pacific Sunset Room
6:50 - 7:00 PM	Closing Remarks (Dean COE)	Pacific Sunset Room
7:00 - 8:30 PM	**VIP Reception**	**Summit Room**

EXPO SCHEDULE OF PRESENTATIONS
FRIDAY, MAY 5, 2023

TIME	SESSIONS/ACTIVITY	LOCATION
1:00 - 1:15 PM	Welcome & Introduction (Dean COE)	Pacific Sunset Room
1:15 - 2:45 PM	**Biomedical Engineering** (Session Chairs: Ahrar, Suh)	
	Department Introduction (BME Chair)	Pacific Sunset Room
	Senior Design Course Introduction (Instructors)	Pacific Sunset Room
	Student Demos, Competition, and Judging, Metaverse Exhibit (Live demos & Video) Outreach event: SATO Visit	Pacific Sunset Room and Hallway, Summit Room (Judging)
	Metaverse Video	Pacific Sunset Room
	BME Awards Ceremony	Pacific Sunset Room
2:45 - 3:00 PM	Coffee Break	Pacific Sunset Room
3:00 - 4:30 PM	**Electrical Engineering** (Session Chair: Ahmed)	
	Department Introduction (EE Chair)	Pacific Sunset Room
	Senior Design Course Introduction (Instructors)	Pacific Sunset Room
	Student Demos, Competition, and Judging	Pacific Sunset Room and Hallway, Summit Room (Judging)
	EE Awards Ceremony	Pacific Sunset Room
4:30 - 6:00 PM	**VIP Reception** (industry/faculty) **Coffee Break** (students)	**Summit Room** **Pacific Sunset Room**
6:00 - 8:30 PM	**Computer Engineering and Computer Science** (Session Chairs: Cregg, Vong)	
	Department Introduction (CECS Chair)	Pacific Sunset Room
	Senior Design Course Introduction (Instructors)	Pacific Sunset Room
	Student Spotlight Presentations	Pacific Sunset Room
	Student Demos, Competition, and Judging	Pacific Sunset Room and Hallway, Summit Room (Judging)
	CECS Awards Ceremony	Pacific Sunset Room
8:30 PM	Closing Remarks (Dean COE)	Pacific Sunset Room

DISPLAY STATIONS MAP

The Pointe, Walter Pyramid



BEACH

SENIOR DESIGN PROJECTS

Titles + Table Locations

THURSDAY, MAY 4, 2023

AEROSPACE ENGINEERING:

9 Hybrid-Electric Regional Turboprop Aircraft
9 New Efficient Water and Terrestrial (NEWT) Aircraft
10 Automated Refueling Cislunar Outpost (ARCO) Spacecraft
11 A full scale Kersone-Nitrous liquid rocket with Regenerately cooled rocket nozzle
12 A full scale Lox-Kerosine pressure fed propulsion static fire test stand for a 2000 lbf of thrust

CHEMICAL ENGINEERING:

1 Styrene Production Plant Design Group #1
2 Styrene Production Plant Design Group #2
3 Styrene Production Plant Design Group #3
4 Styrene Production Plant Design Group #4
5 Styrene Production Plant Design Group #5

CIVIL ENGINEERING AND CONSTRUCTION ENGINEERING MANAGEMENT:

6 Gym at Santa Ana, CA
6 Rehab Center at Santa Ana, CA
7 Senior Center Living Facility, Glendora, CA
7 Senior Care Center, Glendora, CA
8 Midoori House

21 Metaverse Exhibit

MECHANICAL ENGINEERING:

13 Computer Aided Manual Transmission
13 Automated Camera Deployment Mechanism
14 Crush N' Sort
14 Water Conservation Shower Setup
15 Campfire Entrapment
15 Polyaxial and Planar Screw Assembly
16 Compact Emergency Tool
17 Portable Wind Turbine Base
18 Portable Solar-powered Cooler
18 Project Coastways
20 3D Resin Remover
22 ABS Electric Bicycle System
23 Parabolic Solar Pool Heater
24 Sanitary Hand Dryer
25 Automated Stud Finder
26 Flow Bench
27 Variable Position Wing For Increased Drag
28 Automated Crutch
29 Autonomous Disassembly Robot
30 The Portable Dewrinkler
31 Inverted Pendulum Platform
32 Powder Dispenser
33 Assistive Driving System
34 Hole Diameter Gauge

SENIOR DESIGN PROJECTS

Titles + Table Locations

FRIDAY, MAY 5, 2023

BIOMEDICAL ENGINEERING:

1 LVAD project
2 Dual-view microscope
3 Assistive prosthetic hand
4 3D printed micro-electrodes for biotechnology
5 Cell Encapsulation project
6 Systems to cultivate plants (Towards terraforming Mars)
7 Portable incubator
8 Pressure myography platform
9 Image analysis system for mechanical testing of medical devices

ELECTRICAL ENGINEERING:

10 Arbitrary Function Generator
11 Hand Gesture Controlled Robotic Arm
12 Automatic Ukulele Tuner
13 Maglev Train
14 Seven Band Equalizer
15 Hand Gesture Controlled Robotic Arm
16 Magnetic Levitation of a Lamp
17 Virtual Oscilloscope

21 Metaverse Exhibit

COMPUTER SCIENCE AND COMPUTER ENGINEERING:

18 RPS Game
19 CheaperEater
20 CanvaCord
22 RemindMe
23 BugYet
23 Find Potty
24 Hampage
24 Quack Quack Go
25 FutureGoogleDevs / Crave
25 FoodDood
26 WeCasa
27 R3-Cooler
28 Better Board Game Board
29 Smart Cart
30 Wall Insiders - Project Walldo
31 Bad Mouth
32 Bicycle Upgrade Kit
33 Home Fitness Tracker
34 Smart Pack

SENIOR DESIGN PROJECT
IN THE METAVERSE





INTEGRATING METAVERSE IN THE COE CURRICULUM!





SEE THE WORK.

JOIN THE COMMUNITY.

FIND SUPPORT, EVENTS, AND RESOURCES.











ENGINEERING CORPORATE AFFILIATES

The Engineering Corporate Affiliates program is a mutually beneficial collaboration between industry and the College of Engineering to support senior design (capstone) projects and co-curricular project-based learning.

The Corporate Affiliates sponsor projects and can engage their employees as mentors to our talented students in areas of interest to the company. In addition, they have access to all senior design projects via the annual Senior Design Expo, and enjoy a suite of recognition, student engagement, and recruitment benefits. The faculty and students, in turn, gain knowledge of the insights, challenges, and priorities of industry. Corporate Affiliate membership fees support project costs, faculty mentoring, publication/presentation of projects, and the annual Senior Project Expo event.

Project-based learning is a cornerstone of engineering education at The Beach. We believe in the power of learning by doing, and the soft skills development that is fostered by project-based learning. Teamwork, communication, and leadership are practiced and honed, alongside application of theory, design, and implementation.

Engineering Corporate Affiliates memberships start at $10,000. For further information, please contact Paras Shah at paras.shah@csulb.edu.

Engineering Corporate Affiliates

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