



CALIFORNIA STATE UNIVERSITY

LONG BEACH

College of Engineering

20
24

MAY 9TH

SENIOR DESIGN PROJECT EXPO

■ THE
WALTER
PYRAMID

College of Engineering
California State University, Long Beach

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



MESSAGE FROM THE COE AFFILIATES PROGRAM CHAIR

Today, we are celebrating a year-long achievement of our students and faculty in sharing their Senior Design Projects with our community.

Our industry partners, incoming freshmen, and high-school students join us today for the 2nd Senior Design Expo of the College of Engineering!

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 full-day program of the Senior Design Expo 2024!



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



Ebrahim Amiri
Electrical Engineering



Lisa Star
Civil Engineering and
Construction Engineering
Management



Jalal Torabzadeh
Mechanical and
Aerospace Engineering

WELCOME FROM THE DEAN

I am thrilled to welcome you to the second annual Senior Design Project Expo at the College of Engineering!

Building on the success of last year's inaugural event, we have once again gathered to showcase the innovative projects of our senior engineering students. This expo, organized under the guidance of Dr. Emel Demircan and our dedicated department chairs and senior project instructors, represents a cornerstone of our commitment to fostering a dynamic relationship between our students and industry.

As you explore the projects on display, you will see how our students have risen to the challenges of engineering design, pushing technological boundaries and striving to make a meaningful impact on society. These projects not only reflect their hard work and creativity but also their readiness to contribute as future professionals as engineers and computer scientists.

Please engage with our students, share your expertise, and offer feedback that can help guide their ongoing development. Your participation is invaluable as we continue to nurture these future leaders.

Thank you for supporting our vision and efforts. I hope you find inspiration and insight throughout the expo today.

Go BEACH!



A handwritten signature in black ink that reads "Jinny Rhee".

Dean Jinny Rhee

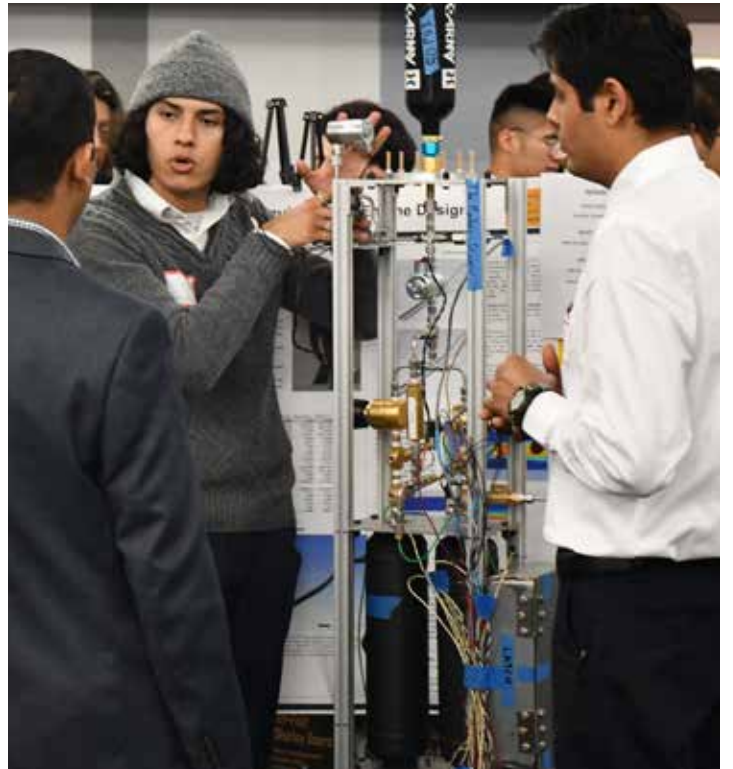
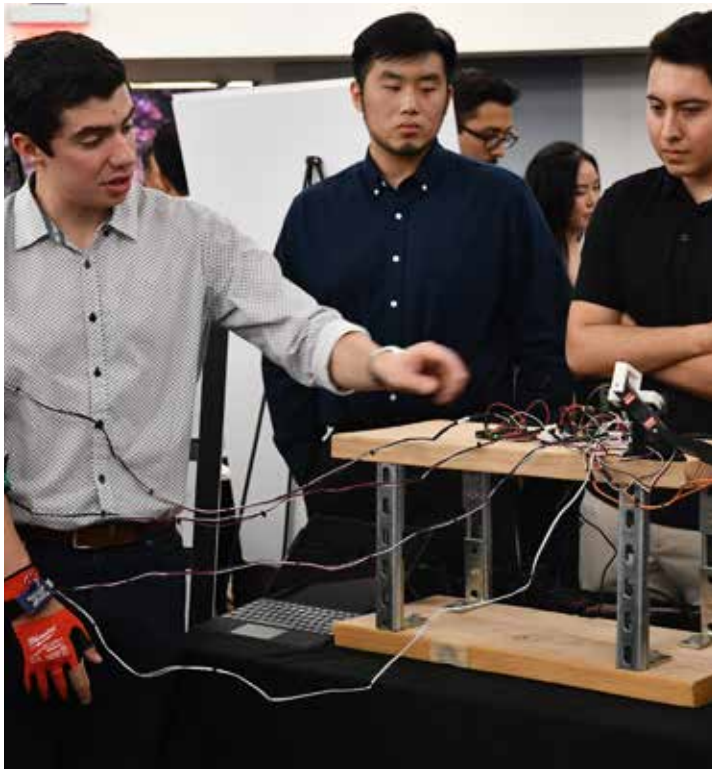
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EXPO SCHEDULE

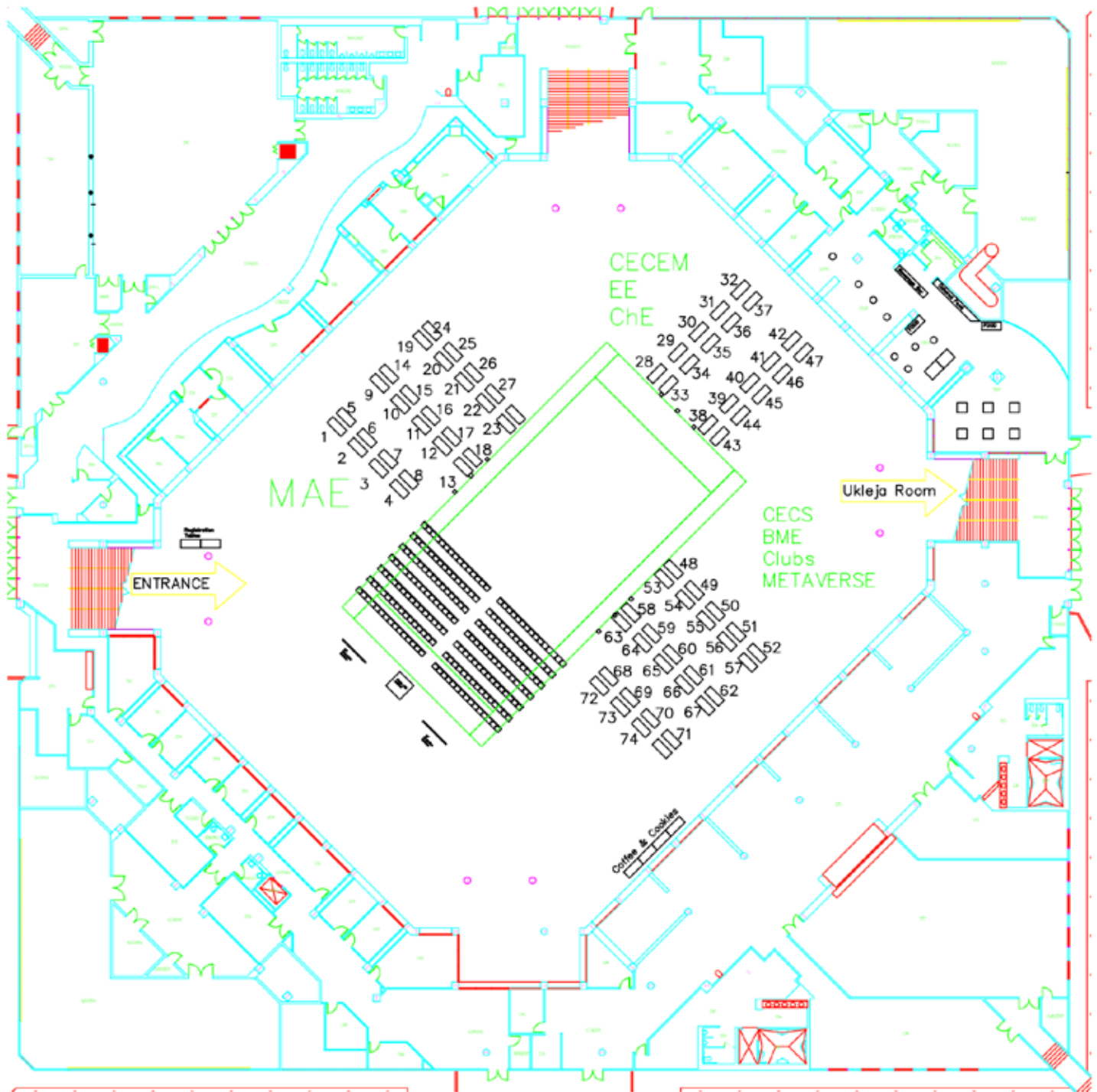
THURSDAY, MAY 9, 2024

TIME	SESSION
8:00 - 8:45 AM	Registration Breakfast (Ukleja Room)
8:45 AM	Opening Remarks by the College of Engineering Dean Rhee
9:00 - 10:00 AM	Electrical Engineering (Session Chairs: Amiri, Hirunthanakorn) Civil Engineering (Session Chairs: Star, Ko)
10:00 - 10:15 AM	Coffee Break Metaverse & Student Clubs Exhibits
10:15 - 11:30 AM	Chemical Engineering (Session Chairs: Lo, Nazar)
11:30 - 12:30 PM	Lunch (Ukleja Room)
12:30 - 2:45 PM	Biomedical Engineering (Session Chairs: Asgari, Suh, Ahrar)
2:45 - 3:00 PM	Coffee Break Metaverse & Student Clubs Exhibits
3:00 - 5:30 PM	Mechanical and Aerospace Engineering (Session Chairs: Torabzadeh, Roy)
5:30 - 6:30 PM	VIP Reception (Ukleja Room)
6:30 - 9:00 PM	Computer Engineering and Computer Science (Session Chairs: Aliasgari, Cregg)
9:00 PM	Closing Remarks by the College of Engineering Dean Rhee



DISPLAY STATIONS MAP

■ The Walter Pyramid



SENIOR DESIGN PROJECTS

■ Table Locations + Project Titles

MECHANICAL AND AEROSPACE ENGINEERING:

- 1 Refrigerated Street Vendor Cart
- 2 Food Dispenser
- 3 Stair-Climbing Robot with Leveling Platform
- 4 Wave Energy Generator
- 5 Small Scale Utensil Sorter for Tight Spaces
- 6 Oil Filtration System
- 7 Peripheral Vision Glasses
- 8 Remote Control Palm Tree Trimmer
- 9 Low Cost Adjustable Prosthetic Arm Base
- 10 Car Lift System
- 11 CNT Hair Sensors
- 12 Underwater Oil Spill Detection System
- 13 Self-drying Umbrella
- 14 STEM Kit
- 15 Tilt-in-Space All Terrain Wheelchair
- 16 Zero Emission Mechanical Ferry
- 17 Disposable Wildfire Recon UAV
- 18 Wheelchair Modification for a Quadriplegic
- 19 Solar Powered Hydrogen Generator
- 20 Mechanical Prosthetic
- 21 Suspension Dyno
- 22 Foldable Bike
- 23 Beachcomber
- 24 Robotic Arm Manufacturing Attachment
- 25 3D Filament Recycler
- 26 Cool Jacket
- 27 Filming Dolly

ELECTRICAL ENGINEERING:

- 28 Auto Leveling Control for Industrial Fluid Systems
- 29 Smart Gardening System
- 30 Design of a Handheld LoRa Device
- 31 Improving Accuracy of Pulse Rate Detection on Various Skin Pigmentation
- 32 Smart Solar Power Controller
- 33 Beamforming and Modulation with Software Defined Radio Using NI USRP
- 34 Spatial Modulation with Simulation and Software Defined Radio Implementation
- 35 OFDM Subcarrier Index Modulation with Conventional and Machine-Learning Based Estimation
- 36 Polarization Division Multiple Access and Machine-Learning Based Modulation Classification

CIVIL ENGINEERING AND CONSTRUCTION ENGINEERING MANAGEMENT:

- 37-38-39 Core & Shell Office Space Design & Build Project
- 40 El Monte Community Youth Center
- 41 North Hollywood Library
- 42 Abbeywood Housing Community
- 43 Evergreen Wellness Center Project

CHEMICAL ENGINEERING:

- 44 Hydrogen Recovery
- 45 Flare Gas Recovery
- 46 Carbon Dioxide Recovery from Flue Gas
- 47 Bio Diesel Production

SENIOR DESIGN PROJECTS

■ Table Locations + Project Titles

BIOMEDICAL ENGINEERING:

- 48 Multi-modular Wearable Sensors with Tattoo Electrodes and SpO2 Integration
- 49 Compression Therapy via Silicone-based Soft Actuation
- 50 Low-Cost Platform for Assessment of 3D Printed Blood Vessels
- 51 Cell Encapsulation via Fibrin Microbeads for Vascularization Therapies
- 52 EEG based BCI Mobile Device
- 53 Physiologically Informed Microfluidics and Imaging Platform for Vertical Swimming of Microorganisms

54-55-56 Metaverse & Clubs

COMPUTER SCIENCE AND COMPUTER ENGINEERING:

- 57 Land Drone
- 58 "What The Drone Doin"
- 59 "Roadies"
- 60 Desktop Companion
- 61 Smartstroller
- 62 EqualSafe
- 63 R2ARC
- 64 Team Ponder
- 65 Team Melody
- 66 Team InterMeet
- 67 DesignScape
- 68 Pillventory
- 69 Dance Dance Evolution
- 70 BeachEats
- 71 PlayListify
- 72 StarShares
- 73 Sports Car Spotter
- 74 Partion



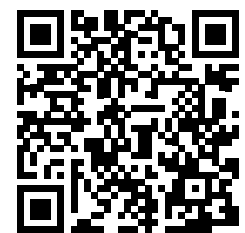
SENIOR DESIGN PROJECT IN THE METAVERSE



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.

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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.

For further information about Engineering Corporate Affiliates membership, please contact Paras Shah at paras.shah@csulb.edu.

Engineering Corporate Affiliates



Additional support for project-based learning provided by WestLAND Group, ISEC, Inc, and Southern California Contractor's Association.



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