

## **Mechanical and Materials Engineering (MME) Department Projects**

Time: 8.30am – 12pm (Alden Hall)

### **1. Design and Prototyping of a Wankel Engine**

Students: Patrick Leach, William Hopkins, Ryan Gillett, Yutai Han  
Advisor: Selcuk Guceri

### **2. Design, Simulate, Build, and Test an RC Airplane**

Students: Kalle Asaro, Delaney Cox, Heather Oxford, Everett Wonson  
Advisor: Alireza Ebadi  
Sponsors: BAE Systems, Aimtek, Oxford Consulting

### **3. Smart Mechanical Backstop**

Students: Emily Doucette, Marissa Lamprey, Joseph Salvon, Adam Marsh, Jeffrey Brennan  
Advisor: Christopher Brown

### **4. Locker with Accessible High Shelf**

Students: Annika Keck, Colin Canniff  
Advisor: Eben Cobb

### **5. Reconstruction of a High-Rise Fire Using Experimental and Computational Techniques**

Students: Abigail Benoit, Grace Cummings, Matthew Guarneri, Peter Guertin  
Advisor: Milosh Puchovsky (FPE)

### **6. An Improved Actuation System for an Artificial Tongue Prosthesis**

Students: Luese Ufuah, Tatyana Barthold, Hope Soucy, Marc Voorhees, Declan Williams  
Advisors: Pradeep Radhakrishnan, Dirk Albrecht (BME)  
Sponsor: Women's Impact Network

### **7. Modular Package for Autonomous Driving (mPAD)**

Students: Rohan Anand, Martin Bleakley, Allison Colon-Heyliger, Ian Khung, Ishan Rathi  
Advisors: Pradeep Radhakrishnan, Kaveh Pahlavan (ECE, CS)

### **8. High Energy Density Magnesium-Air Battery for Shipping, Rail and Aviation Electrification and Grid Storage**

Students: Kurt Lindentha, Tyler Riggs, Edward Miller, Jaqueline Simon-Villacis  
Advisor: Adam Clayton Powell

### **9. Mechanism Design for Avoiding Ice Deformation in Fixed Docks**

Students: Tim Loosigian, James Barrera, Cole Rabe  
Advisor: Alireza Ebadi

### **10. Smart Net**

Students: Michael Sposato, Noah Skinner, Joseph Durocher, Aidan Lynn, Noah Litzinger  
Advisor: Alireza Ebadi

### **11. Small Jet Engine Test Fixture, Design and Fabrication**

Students: Amanda Forgione, Bradley Markiewicz, Alexander Almazan, Matthew Lovoi, William Stottlemeyer  
Advisor: Selcuk Guceri

### **12. Electric Jet Ski**

Students: James Hammel, Zachery Therrien, Blake Pedersen, Mathieu Michaud, Samuel Boudreau, Isaac Tufts, Antonio Torres, Patrick Hyland, and Mathew Fredo  
Advisors: Mehul Bhatia, Steven Bitar (ECE)

**13. Robot Ecosystem for Monitoring Climate Change**

Students: Kalina Bonofiglio, Lauryn Whiteside, Maya Angeles, Matthew Haahr, Brandon, Simpson, Josh Palmer  
Advisor: Markus Nemitz

**14. BoGL Web: An Application for Generating Bond Graphs on the Web**

Students: Margaret Earnest, Jakob Misbach, Anthony Vuolo  
Advisors: David C. Brown (CS), Pradeep Radhakrishnan, Brigitte Servatius (MA)

**15. Fast Food Waste**

Students: Alexander Guerra, Wirt Addison Jones IV  
Advisors: Mehul Bhatia, Reeta Rao

**16. Realistic Shoulder Model with Soft Tissue Attachments**

Students: Kelly Miller, Fiona McEvelly, Marilyn Senger  
Advisor: Fiona Levey

**17. Development of 3D Printed Humanoid Robots, Koalby and Ava, as Lab Assistants**

Students: Aashish Singh Alag, Zeñia Alarcon, Emily Austin, Tessa Lytle, James Van Milligen  
Advisors: Pradeep Radhakrishnan, Kaveh Pahlavan (ECE)

**18. Getting 3D Printed Humanoid Robots, Koalby and Ava, to Stand and Walk!**

Students: Joshua Fernandez, Erin Lee, Tessa Lytle, Finbarr O'Sullivan, Casey Snow  
Advisors: Pradeep Radhakrishnan, Kaveh Pahlavan (ECE)

**19. Developing a 3D Food Printer**

Students: Nupur Shukla, Ashley Burke, Julia Toplyn  
Advisors: Danielle Cote, Rodica Neamtu (CS)

**20. Low Profile Home Speaker**

Students: Abigail McLean, Aidan Nunes, Brandon Cote, Joseph Martin  
Advisor: Joseph Stabile

**21. Utilizing Waste to Provide an Economically Viable Alternative to Roofing in Ghana**

Students: Michael Morin, Jackson Baker  
Advisors: Robert Krueger (SSPS), Debora Jackson (BUS), Walter Towner (BUS), Mustapha Fofana

**22. Design, model and manufacture an internal combustion engine**

Student: Qianchen Zeng  
Advisor: Alireza Ebadi

**23. Elevator Rope Sway Monitoring**

Students: Jack Johnson, Sage Ortega-Shue, Martin Wadzinski, David Bilis, Jay Yen, Kyle Lopez, Tyler Sanderville  
Advisors: Pradeep Radhakrishnan, Cosme Furlong  
Sponsor: OTIS Elevator Company

**24. Army Exoskeleton**

Students: Roe Hendrick, Alexander Strickland, Luke Reid, Francesco Valagussa, Liudmila Serebrennikova, Nicholas Biliouris  
Advisors: Mehul Bhatia, Songbai Ji (BME), Haichong Zhang (RBE/CS)

**25. Design of an Air Blower System for Fuel Cells**

Students: Sarah Homsy, Evan MacGregor, Grace Blackadar, Jane Spear  
Advisor: Ahmet Subuncu  
Sponsor: Honeywell International, Inc.

### **26. A Transfection Device for Mammalian Cells**

Students: Walter Conway, Anthony Bozza, Shelby Tweedie, Luis Sandoval  
Advisors: Sakthikumar Ambady (BME), Ahmet Can Sabuncu, Aswin Gnanaskandan

### **27. Boot Insole-Based Triboelectric Power Generation in Military Applications**

Students: Robert Hyers, Andrew Ferrecchia, Kyle MacPherson, Katherine Morissette  
Advisors: Pratap Rao, Gregory Noetscher (ECE)  
Sponsor: U.S. Army Combat Capabilities Development Command Soldier Center

### **28. Solar Agribots**

Students: Taylor Frederick, Ashley Pavlov, Noelle Crump, Philgen Simpson, Jay Piyajarawong, Travis Thompson, Lin Guan, Tianshu Wang, Vasil Bozdo  
Advisors: Mehul Bhatia, Nicholas Bertozzi (RBE), Joseph Bec (CS), Markus Nemitz (ECE)

### **29. Development of Formative Stress Models and Projects**

Student: Emily Coughlin  
Advisors: John Sullivan, Sarah Jane Wodin-Schwartz

### **30. Saving Bicycles**

Students: Hannah Boucher, Michaela Kelly, Molly MacAllister, Kian Tuma  
Advisor: Fiona Levey

### **31. Design of Adjustable Rehabilitative-Assisted Mechanism for Rodents Suffering from Spinal Cord Injury**

Students: Yanbo Dai, Xianhan Jia, Zhengrong Tang, Haojun Yan  
Advisors: Yuxiang Liu, Xiangnan Kong (CS)

### **32. Smart Wearable Football Helmet**

Students: Amanda Smith, Regan Krizan, Julie Lee, Mitchell DeVillers, Adam Olson  
Advisors: Mehul Bhatia, Songbai Ji (BME)

### **33. Design, Optimization and Testing of an Electric Formula SAE Vehicle**

Students: Thomas Walsh, Alex Wessel, Alan Robertson, Jared Bushnell, Sam Sands, Ori Katz, James Mitchell, Edward Clifford, Daniel Ali, Michael Rideout, Javier Espinal, Peter Murray, Macey McEnaney, Emily Kelley, Pranjal Mann, Matthew Reynolds, Eric Gustafson, Sophie Chretien, Henry Livingston, Noah Wolf  
Advisors: William Michaelson (RBE, CS, ECE), David Planchard  
Sponsors: Solidworks, Peterson Steel, Aimtec, SendCutSend, Hoerr Racing Products, Palmer Raceway, Forgione Engineering, Enhanced Street Performance, Autodesk, CBRE

### **34. Repurposing PLA into 3D Printing Filament**

Students: Adam Murrison, Collin Levin, Connor Cumming, Ethan Knight  
Advisor: John Sullivan

### **35. Clearing Ocean Plastic Trash**

Students: Daniel Correa, Sakeena Ghandour, Khalil Haboub, Kaitlin Kelley, John Muirhead, Lily Spero, Shane Stevens, Eli Zimmerman  
Advisors: Joseph Beck (CS), Nicholas Bertozzi (RBE), Selçuk Güçeri

### **36. Fuel Cell Cooling System**

Students: Karl Ghosn, Alferid Hussin Shifa  
Advisors: Ahmet Can Sabuncu  
Sponsor: Honeywell International, Inc.

**37. Developing a Household Level Smart Composter**

Students: Sola Hoffman, Emily Giancola, Hayley Gray, Rebecca Marion, Grace Rydout  
Advisor: Sarah Jane Wodin-Schwartz

**38. Design and Manufacturing of a Wankel Engine**

Students: Daniel Colgate, Kevin Pine, Ferris Florman, Patrick Keiran, Christopher Martin, Deniz Terek  
Advisor: Selçuk Güçeri

**39. EHD Driven Smart Vapor Compression Cycle**

Student: Ashton Lyon  
Advisor: Jamal Yagoobi

**40. The Design of New Synthesis Approach for Low-Cost, Low Environmental Impact Boride**

Students: Edwin Joseph, Sanjeet Pawar, Brian Montenegro  
Advisors: Yu Zhong, Jize Zhang, Rui Wang  
Sponsor: Saint Gobain

**41. Alpine Ski Edge Sharpness and Slicing**

Students: Richard J. Kern, Dylan Z. Flegel  
Advisor: Christopher A. Brown

**42. Device to Aid in Mechanical Ventilation of Obese Patients**

Students: Giulia Herszage Rocha, Mackenzie Damon, Kelly McDonald, Rachel Chan, Madelyn Thrasher  
Advisor: Kristen Billiar  
Sponsor: Dr. Farrukh Ahmad, Saint Vincent Hospital

**43. High Energy Passive Solar System Design in Santa Fe, New Mexico**

Students: Emma Driscoll, Jade Veth, Maren Cork, Sarah Abatiello, Effelia Warden, Sydney Smith  
Advisors: Selcuk Guceri, Stephen Kmiotek (CE), Elisabeth Stoddard (IGSD)

**44. Detecting Ice Nucleation in Supercooled Red Blood Cell Samples**

Students: Madison Gass, Grace Jolin, Isabel Nearing, Kathryn Woodland  
Advisors: Sakthikumar Ambady (BME), Ahmet Can Sabuncu  
Sponsor: Massachusetts General Hospital

**45. Electric Triumph Spitfire MKIV (1972)**

Students: Bradley Sprunger, Blaise Pingree, Grace Magnotta, Wynn Roberts, Shane Donahue, Sean McMillan, Rachael Smith, Patrick Flanigan  
Advisors: Nicholas Bertozzi (RBE/ME), Joshua Cuneo (CS), Donald Brown (ECE), Craig Putnam (RBE)

**46. A Robotic Platform for At-Home Ultrasound Diagnostic Imaging**

Students: Abbey Blauser, Madeline Brady, Christopher Thomas, Elizabeth Viveiros  
Advisors: Yihao Zheng, Ziming Zhang (ECE)

**47. Transfection Device to Modify Mammalian Cells**

Students: Steven Defreitas, Emily Frick, Benjamin Nguyen, Gianluca Panza  
Advisors: Sakthikumar Ambady (BME), Aswin Gnanaskandan, Ahmet Can Sabuncu

**48. 6-Axis Mobile Construction 3-D Printer**

Students: Aaron Longo, Christian Stilwagen  
Advisor: Mohammad Mahdi Agheli Hajiabadi

**49. Non-linear spring systems for managing loads in sports**

Students: Jenny Albores, Dylan Ham, Walter Rodriguez, Skyler Wise

Advisor: Christopher A. Brown

**50. RoboCup Small Sized League Soccer Robots**

Students: Spencer Belleville, Ashley Espeland, Evan Vadeboncoeur, Yifei Zhao, Miya Judy, Logan Rinaldi, Conner Christensen, David Lapointe, Noah Page, Nathan Rogers, Benjamin Schwantes  
Advisors: Siavash Farzan (RBE), Alireza Ebadi, Stephen Bitar (ECE), Joshua Cuneo (CS)

**51. Medical Simulation Testbed for Interventional Cardiology and Neurology**

Students: Nick Miragliotta, Michael Nason, Victor Paiz, Marc Rosenthal, Isadora Sorpol

Advisors: Yihao Zheng and Ziming Zhang (ECE)