ABOUT WPI

Founded in 1865 in Worcester, Mass., WPI is one of the nation’s first engineering and technology universities. Its 14 academic departments offer more than 50 undergraduate and graduate degree programs in science, engineering, technology, business, the social sciences, and the humanities and arts, leading to bachelor’s, master’s and doctoral degrees. WPI’s talented faculty work with students on interdisciplinary research that seeks solutions to important and socially relevant problems in fields as diverse as the life sciences and bioengineering, energy, information security, materials processing, and robotics. Students also have the opportunity to make a difference to communities and organizations around the world through the university’s innovative Global Projects Program. There are more than 40 WPI project centers throughout the Americas, Africa, Asia-Pacific, and Europe.
As a project center, MITRE provides WPI students with opportunities to make impacts working in the public interest. While this deep partnership provides us with more ideas, more talent, and some fresh thinking, the real-world experience prepares WPI graduates to come to MITRE ready to take on our sponsors’ biggest challenges.  

Peter Sherlock, ‘82, ‘86 MS  
Senior Vice President and Director of Bedford Operations  
The MITRE Corporation

WPI Projects Program and Sponsorship

The projects program at WPI is the university’s signature approach to undergraduate education, combining theoretical study with practical problem solving. We bring together the brilliant minds and talents of our student teams and faculty advisors with a wide variety of corporate, government, and nonprofit organizations. Collaboratively, we address real business needs, synergizing to create meaningful results.

Project work is one of the most distinctive aspects of a WPI education and has been at the core of WPI’s undergraduate curriculum for more than 45 years. It provides students the opportunity to gain professional skills, a talent for teamwork, and the confidence to dive right in. Together with our corporate partners, we are making progress one project at a time.

WPI welcomes sponsorship for our Major Qualifying Projects (MQP). If you are interested in discussing a possible sponsorship opportunity, please contact Sharon Deffely, Executive Director of Academic and Corporate Engagement, at 508-831-5635 or sdefely@wpi.edu.

Following are some general guidelines for project sponsorship:

- A project cannot be “mission critical” or on the “critical path.”
- The best types of projects support or enhance current activities.
- Most MQPs consist of a team of students (2-4) and a faculty advisor, although in some cases—depending upon the scope of the project and the disciplines of the student team—there may be additional advisors.

For more information about sponsoring a project, visit wpi.edu/+engage.
Once a year, WPI students take time out from their studies to present to their faculty advisors and sponsors the results of their Major Qualifying Projects, or MQPs (one of two significant academic projects all WPI students complete). The MQP is a professional-level design or research experience generally completed in teams and often sponsored by corporations or other external organizations. The projects mirror the kinds of professional work students will tackle in their careers.

The project experience prepares students to lead team efforts, to communicate professionally, to meet deadlines and exceed expectations, to deal with ambiguity and unexpected difficulties, and to consider not just the technical, but the ethical and social dimensions of their work. The projects must be thoroughly documented in written reports, and virtually all teams make oral presentations of their results. These are the presentations you will see today.

Often MQPs lead to publications in peer-reviewed journals, presentations at regional and national conferences, and patents. Some become the foundations for entrepreneurial ventures. Others become useful innovations and products for their corporate sponsors.

But no matter what becomes of an MQP, the chances are it has already served as an effective capstone to a WPI education and a profound steppingstone to a successful and rewarding career and life.

**Presentations by Department**

3 Aerospace Engineering  
3 Biology and Biotechnology  
5 Bioinformatics/Computational Biology  
5 Biomedical Engineering  
7 Business  
8 Chemical Engineering  
9 Chemistry and Biochemistry  
11 Civil and Environmental Engineering  
12 Computer Science  
14 Electrical and Computer Engineering  
16 Environmental Engineering  
16 Humanities and Arts  
17 Interactive Media & Game Development  
18 Mathematical Sciences  
19 Mechanical Engineering  
21 Physics  
22 Professional Writing  
23 Robotics Engineering  
24 Social Science and Policy Studies
Project Presentation Day Schedule

Aerospace Engineering

Higgins Labs, Room 116

8:30am
Design and Testing of a Scale-Model Surface Undersea Kite (SU SK)
Austin Higgins, Peter Melander, James O’Hara, Mladen Pepic, Derek Porter
Advisors: David Olinger, Nancy Burnham (PH)

8:50am
Coordinated Quadrotor Unmanned Aerial Vehicles
Nicholas Green, Jonathan Griffin, Christopher Mastrangelo, Keith Rockwood, Aaron Vien
Advisor: Raghvendra Cowlagi

9:10am
Design of a Split Hopkinson Pressure Bar for Dynamic Testing of Materials
Bryan Adie, Kieran Cochrane, Anushrot Mohanty, Samuel Sierra
Advisor: Nikhil Karanjgaokar

9:30am
Micro Aircraft Design
Miguel Almeida, George Asare, Alex Brown, Samantha Chernin, Michael DiMilia, Jamie Donahue, Thomas Hlavenka, Alexander Korza, Yutong Li
Advisor: Anthony Linn
Sponsor: AIAA Foundation

10:00am
Classroom Experiment in Longitudinal Stability and Control
Zachary Edelman, Victor Levorse, Brendan Sullivan, Zachary Wingerter
Advisors: Raghvendra Cowlagi, David Olinger

10:20am
Design and Analysis for the Sphinx-NG CubeSat (I)
Emily Curci, Jarrett Jacobson, Weston Schlack, Kelley Slabinski
Advisor: Nikolaos Gatsonis

10:40am
Design and Analysis of the Sphinx-NG CubeSat (II)
Jack Agolli, James Gadoury, Andrew Rathbun
Advisor: Michael Demetriou

11:00am
Design and Analysis of the Sphinx-NG CubeSat (III)
Dong Ko, Steven Laudage, Matthew Murphy, Daniel Pelgrift, Samuel Young
Advisor: John Blandino

11:20am
Plume Analysis and Detection
Eric Fast, Stephen Harnais, Ryan Wiesenberg
Advisors: Michael Demetriou, Nikolaos Gatsonis, Raghvendra Cowlagi (RBE)

Biology and Biotechnology

POSTER SESSION, 9:30am to 11:30am
Rubin Campus Center, Odeum

New Drugs for an Old Disease
Megan Barter, Christine McCarron
Advisors: Mike Buckholt, Scarlet Shell

Effects of Vegetation Structure and Composition on Grassland Bird Habitat Occupancy
Jennifer Bombard
Advisor: Marja Bakermans
Sponsors: Mass Audubon, Trustees of Reservations, Mass Division of Fisheries & Wildlife

Effects of BKCa Channel Activation and ROS Scavenging in Aging Vasculature
Mackenzi McHugh, Eric Borges
Advisor: Reeta Rao
Sponsor: Richard Clements, Brown University

Single-Base Editing of Cellular mRNA by CRISPR/Cas9
Andrew Baker, Kimberly Codding
Advisors: Mike Buckholt, Natalie Farny

Investigating the role of Sec6 and RabE during polarized cell growth in Physcomitrella patens
Allison Butt
Advisor: Luis Vidali, Destin Heilman (CH)
Sponsor: Mary Munson, UMass
Characterization of Kekkon5
Chloe LaJeunesse
Advisor: Joe Duffy

Effects of Proteomic Digest Vonditions and sample contamination on Protein Quantitation in CSF and Plasma
Emma-Jane Turton
Advisor: Dave Adams
Sponsor: Sanofi Genzyme

Using the Auxin-Induced Degradation System to Dissect Factors within the Exocyst
Rachael Heard
Advisor: Jagan Srinivasan
Sponsor: Mary Munson, UMass

The Role of C. albicans Secreted Aspartyl Proteases (SAPs) in Phagocyte Recognition via Pathogen Recognition Receptors (PRRs)
Jeffrey Letourneau
Advisors: Reeta Rao

Lyme Disease and Indicators of Biodiversity
Alessandra Chiaramonte, Catherine Souza
Advisors: Marja Bakermans

Small Animal Euthanasia
Evelyn Platko, Julia Holtzman
Advisor: Jill Rulfs
Sponsor: Alicia Karas, Tufts

Novel Antibiotic Isolation and Characterization from Soil Bacteria
Colin Harrington, Matthew Googins, Parsant Jotikasthira
Advisors: Mike Buckholt

Determining the Role of Aurora A Kinase and Implications of its Inhibition in Acute Myeloid Leukemia
Eva Childers, Bernat Navarro Serer
Advisor: Amity Manning

Role of the 5’ UTR in Expression of an Essential Heat Shock Protein in M. smegmatis
David Morgan
Advisor: Scarlet Shell

Regulation of Mitotic DNA Damage by the Retinoblastoma Tumor Suppressor Protein
Lindsay Gurska
Advisor: Amity Manning

Gene Therapy of Pompe Disease in a Mouse Model Using Viruses Encoding GAA
Samantha Bircsak
Advisor: Dave Adams
Sponsor: Dr. El Mallah, UMass

Effects of Genistein on Ovarian Cancer
Allison Fechtmann, Alena Grilla
Advisors: Jill Rulfs, Mike Buckholt

Gender-based Differences in ALS and Parkinson’s disease expression in C. elegans
Rebecca Burns, Marissa Patterson, Aidan Burn
Advisors: Jagan Srinivasan, Jeanine Skorinko (HUA)

Artemisia annua and Its Effects on Cancer Proliferation
Edward Dring, Sebastian Espinosa
Advisors: Jill Rulfs, Mike Buckholt

The Role of RUNX2 in Mixed Lineage Leukemia
April Solon
Advisors: Dave Adams
Sponsor: Lucio Castilla, UMass

To Stress or Not to Stress: Pesticides and Cellular Stress Response
Cecelia Cotter, Miranda Lawell
Advisors: Natalie Farny, Mike Buckholt

Characterizing Microglial Interactions with Cortical Neurons in the Development of the Healthy Brain
Frederick Gergits
Advisor: Natalie Farny
Sponsor: Dorothy Schafer, UMass

Examination of Chemosensation and Aversive Behaviors in C. elegans
Jaden Yabut
Advisor: Jagan Srinivasan

Are THP-1 Derived Macrophages a Comparable Model System for Primary Human Dendritic Cells?
Rachel Brown
Advisor: Elizabeth Ryder
Sponsor: Manuel Garber, UMass

Characterization of Chromosomal Mutations of Human Embryonic Stem Cell That Fail to Differentiate
Arba Karcini
Advisor: Tanja Dominko

Assessing Artemisinin’s Treatment Viability in MCF7 Cells
Whitney Hazard, Rebecca German, Reed Maxim
Advisors: Jill Rulfs, Mike Buckholt

Effects of Stress on Levels of RNA Degradation Proteins in Mycobacterium smegmatis
Charlotte Reames
Advisor: Scarlet Shell

Development of Engineered Bacteria for Agglutination-based Dengue Detection
Shelby McQueston, Niamh Fennessy, Hannah Thompson
Advisors: Natalie Farny, Mike Buckholt
Habitat Management for Grassland Birds at Westover Air Reserve Base
Brian Amato
Advisor: Marja Bakermans
Sponsors: Mass Division of Fisheries & Wildlife, Westover Air Reserve Base

Replication Timing in the Yeast Species *Saccharomyces cerevisiae*
Anna Wortman
Advisor: Reeta Rao
Sponsor: Nick Rhinde, UMass

Post-Transcriptional Regulation of Maternal mRNAs in the *C. elegans* Germline and Early Embryogenesis
Zahra Khazal
Advisor: Jagan Srinivasan
Sponsor: Sean Ryder, UMass

*Bacillus subtilis* as a Probiotic: Implications for Inflammatory Bowel Disease and Intestinal Colonization of *Candida Albicans*
Meredith Rioux
Advisor: Reeta Rao

Bioinformatics and Computational Biology

POSTER SESSION, 9:30am to Noon
Rubin Campus Center, Odeum

Are THP-1 Derived Macrophages a Comparable Model System for Primary Human Dendritic Cells?
Rachel Brown
Advisor: Elizabeth Ryder
Sponsor: Manuel Garber, UMass

Biomedical Engineering

SESSION 1: 9:00am to Noon
Salisbury Labs, Room 115 (Kinnicutt)

9:10am
Equine Lung Function Testing Device
Lucy Garvey, Lubna Hassan, Kyla Nichols, Allison Paquin
Advisors: Marsha Rolle, Melissa Mazan (Tufts), Robert Daniello (ME)

9:30am
VitaCream: A Cosmetic Skin Cream to Revolutionize Skincare
Peyton Delgorio, Drew DeRubeis, Conrad Ruiz
Advisors: Glenn Gaudette, Kristen Billiar

9:50am
Electrospun Tissue Engineering Scaffold
Michelle Bleau, Hasson Shakor Harris Wilcher, Benjamin Heney, Zachary Simpson
Advisors: Sakthikumar Ambady, Amy Peterson (CHE)

10:10am
Design of a Universal Microscope Incubator for Drug Screening of 3D Models of Engineered Myocardium
Rachel Connolly, Marianne Kanellias, Heather Stratica
Advisors: George Pins, John Sullivan (ME)

10:40am
Automated Uniaxial Tension System for Mechanically Active Tissue Culture
Thomas Flannery, Gregory Molica, Kate Rielly, Nathan Rumpf
Advisors: Glenn Gaudette, Songbai Ji

11:00am
Obstetric Cervical Ripening Device
Katie Brochu, Taylor Flaxington, Jocelyn Kurtze
Advisors: Marsha Rolle, Ryan Callery (UMass)

SESSIO N II: 9:00am to Noon
Salisbury Labs, Room 104

9:10am
Engineered Connective Tissue Scar Model for Regenerative Medicine Applications
Daniela Barbery, Hanne Richardson, Fernando Salazar
Advisors: Raymond Page, Tanja Dominko (BBT)

9:30am
Hydrogel Microfluidic System to Control Oxygen Gradients for Breast Cancer Cells
Franklin Alvarez, Michelle Henderson
Advisor: Dirk Albrecht

9:50am
Design of a Prosthesis for Canines with Front Limb Deformities
Mushtaq Al Zuhairi, Norma Bachman, Melanie Lasso, Oluwajomiloju Olaode, Elizabeth Walfield
Advisors: Karen Troy, Tiffiny Butler
10:10am
Point of Care Testing for Kidney Hemodialysis
Sean Fallon, Erin LaBounty, 
Brianna Parent, Sarah Rogers 
Advisor: Mustapha Fofana (ME)

10:40am
Pressure Ulcer Prevention Patch System
Rachel Ooyama-Searls, Brittney Pachucki, Benjamin Parent 
Advisor: Yitzhak Mendelson

11:00am
Seed Train Development for Vero Cells in the XDR-200
Nicholas Dalton, Charles Hill, Elie Karam, 
Colin Larson, Zachary McKinzie 
Advisors: Zoe Reidinger, Kamal Rashid (BBT), 
Patrick Guertin (GE), Hao Zhang (GE), 
Yasser Kehail (GE), Chris Dunn (GE)

11:20am
MagneForce: A Modular Tri-Axial Force Sensor for Gait Analysis
Brandon Lam (ME), David Laovoravit (RBE), Nathan Stomberg 
Advisors: Karen Troy, Cagdas Onal (ME)

11:40am
Cold Chain Device Viability for UAS Delivered Medical Supplies
Michael Beinor (ME), Evan Bosia (ME), Scott Cazier, Keegan Train (ME) 
Advisors: Jianyu Liang (ME), 
Gregory Fischer (ME)

SESSION III: 9:00am to Noon 
Salisbury Labs, Room 105

9:10am
Low Cost Malaria Detection
Benjamin Grondin, Benjamin Hassett, 
Taryn Loomis 
Advisor: Zoe Reidinger

9:30am
A Fastening Device for Rotator Cuff Repair
Alexandra Czamara, Anne McLoughlin, 
Kyra McNamara, Lindsay Schneider 
Advisors: Saktikumar Ambady, 
Robert Meislin (NYU)

9:50am
Accurate Prosthetic Hand
Casey Kracinovich (RBE), Mervyn Larrier, 
Dylan Renshaw, Elina Saint Elme (ME) 
Advisors: Karen Troy, Marko Popovic (PH)

10:10am
Realistic Simulated Organs for Ultrasound Guided Procedures
Mikayla Bolduc, Briana Rodriguez 
Advisors: Kwonmoo Lee, Sawart Hussain (UMass)

10:40am
Developing a Multiplexing Assay System for the Quality Control of Cell Therapy Products
Julia Smith, Thai Trinh, Amishi Vairagade 
Advisors: Kristen Billiar, Edward Clancy (ECE)

11:00am
High-Throughput Maturation of Tissue-Engineered Skeletal Muscle Constructs
Benjamin Cossette, Annabella Goncalves, 
Alexander Marry, Mina William 
Advisor: Raymond Page

11:20am
A Reflectance Sensor Holder for PPG Measurements from the Chest
Tori Claverie, Cobi Finkelstein, Nicholas McNary 
Advisor: Yitzhak Mendelson

SESSION IV: 9:00am to Noon 
Salisbury Labs, Room 406

9:10am
Design of a Non-Invasive Device to Measure Bone Strength Recovery of Distal Radius Fractures for Use with HR-pQCT Imaging
Jennifer Golden, Ahmed Hakim, Hannah Sattler 

9:30am
Neuromodulation by Mechanical Strain in C. elegans
Benjamin Duncan, Jacob Maalouf, 
Alexander Noonan, Tristan Petit, 
Advisors: Dirk Albrecht, Songbai Ji

9:50am
Designing a Viral Reduction System for FDA Approval in Fibrin Sutures
Brian D’Amore, Emily Ferreira, 
Erin McConnaghy 
Advisors: Glenn Gaudette, Jeannine Coburn

10:10am
Novel Adaptive Gripping Device for Fine Motor Control
Sarah Bucknam, Caitlin Grow 
Advisors: Kwonmoo Lee, 
Pradeep Radhakrishnan (ME)
**10:40am**

**Composite Fibrin Scaffold for Skeletal Muscle Regeneration**
Alexandra Burr, Anthony Campagna (CHE), Janine Fatal, James Lin, Elizabeth Van Zyl
Advisors: George Pins, Jeannine Coburn

**11:00am**

**Expandable Blades for Precision Veterinary Myringotomy**
Kaitlin Beach (ME), Jack Blanchard, Michael Clark (ME), Nicole Quintal, Connor Tower
Advisors: Kristen Billiar, Andrea Lam (Tufts), Christine Zewe (Tufts)

**11:20am**

**A Surgical Fastener to Prevent Type I Rears in Rotator Cuff Repair Surgeries**
Nicholas Brocato, Kristin Gallagher, Gabriela Meza, Emily Viloudaki
Advisors: Sakthikumar Ambady, Robert Meislin (NYU)

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**Business**

**POSTER SESSION, 8:30am to Noon**

**Washburn Shops, Room 229**

**A Business Plan to Implement Procedures and Operations of Snail Farming for Higher Ground Farm**
Travis Clark, Zulean Cruz-Diaz, Hannah Navarro, Alyssa Perry
Advisors: Michael Elmes, Karla Mendoza Abarca
Sponsor: John Stoddard

**Active Trading in the Renewable Energy Sector: A Performance Evaluation**
Aristotelis Papadopoulos
Advisor: Dimitrios Koutmos

**Barclays QA Automated GUI Testing Migration Analysis**
Didi Dai, Jonathan Ho Wu
Advisors: Xinning Huang (EE), Renata Konrad, Kevin Sweeney
Sponsor: Barclays PLC

**BNP Paribas: Budget Automation**
Jacqueline Ngo, Nan Zhang
Advisors: Michael Ciardaldi (CS), Renata Konrad, Kevin Sweeney
Sponsor: Andrew Clark

**Business Optimization for the Formula SAE Club**
David Powers
Advisors: David Planchard (ME), Kevin Sweeney
Sponsor: WPI Formula SAE Team

**Campus Event Finder Application**
Tyler Bennett, Zahr Lyttle, Brandon Malofsky, Matthew McCarthy, John Ross
Advisors: Diane Strong, Wilson Wong (CS)

**Commercialization Strategy for Solar Technology**
Jahan Dadlani, Luis Garcia, Marcus Middleton, Pabitra Saikee
Advisor: Frank Hoy

**Current State Analysis and Long-Term Recommendations for Employee Diabetes Management**
John Mastroianni, John Perry, Gretchen Siewert, Mona Yuan
Advisor: Sharon Johnson
Sponsor: UMass Memorial Health Care

**Design and Analysis of Cognitive Focus Devices**
Brianna Fogal, Connor McGrath, Carolina Ramos, Ashley Stanley, Daniel Sturman
Advisors: Bland Addison (HU), Torbjorn Bergstrom (ME), Walter Towner, Helen Vassallo

**Developing a Marketing Plan for The Christian Science Monitor**
Sean Doncaster, Jason Lamb, Brian Murtagh
Advisors: Karla Mendoza Abarca, Purvi Shah
Sponsor: The Christian Science Monitor

**Development of a Decision Support App for Perinatal Depression**
Nicolas Adami-Sampson, Trivani Shahi, Nicholas Shannon, Leif Waugh, Drew Wethern
Advisor: Bengisu Tulu
Sponsors: Kathleen Biebel, Nancy Byatt, Tiffany Moore-Simas

**Enhancing Mindfulness-Based Stress Reduction Through a Mobile Application**
Richard Falzone, Andrew Mahn, Nicholas Patak, Juan Rodriguez
Advisor: Eleanor Loiacono
Sponsor: UMass Medical School

**Ice Hockey Coaching Device Design, Marketing, and Feasibility Analysis**
Conor Crowley, Robert McGuire
Advisors: Torbjorn Bergstrom (ME), Walter Towner, Helen Vassallo
Implementing Lean Solutions at the Front Desk of Hahnemann Family Health Center
Mark DeVries, Emily Martin, Stephen Reilly, Ashley Valdez
Advisor: Sharon Johnson
Sponsor: UMass Hahnemann Family Health Center

Improving Manual and Automated Text Simplification
Kyle Hudgins, Serra Onder, Rong Tang, Ziyu Zhou
Advisor: Soussan Djamasbi
Sponsors: IBM Accessibility Research, UMass Boston, UMass Medical School

Improving Student Placement in IQP Centers via Preference Matching
Camila Dias, Lin Jiang, Elizabeth Karpinski
Advisor: Andrew Trapp
Sponsor: Interdisciplinary and Global Studies Division (IGSD)

Lean Process Improvement at Mack Molding
Jane Bingel, Allison Buckley, Tyler Kilkenny, Casey Magrath, Justice Williams
Advisors: Walter Towner, Helen Vassallo
Sponsor: Mack Molding

Lean Process Improvement at the Boylston Fire Department
Maria Luckette
Advisors: Walter Towner, Helen Vassallo
Sponsor: Boylston Fire Department

Oil Market Analysis for Teal
Nicholaus Jasinski, Akshay Rao, Sarah Terwilliger
Advisors: Alexander Smith (SSPS), Kevin Sweeney, Amy Zeng
Sponsor: Andrew Aberdale

Operator Touch Time Analysis at Skyworks Solutions Inc.
Marissa San Andres, Jose Spiegel, Luis Vargas, Andres Vega
Advisors: Walter Towner, Helen Vassallo
Sponsor: Skyworks Inc.

Pressure Ulcer Prevention System
Amanda Agdeppa, Syed Ali Hussain, Hyunsoo Kim, Victoria Loehle
Advisors: Shamsur Mazumder (EE), John McNeill (EE), Walter Towner, Helen Vassallo
Sponsor: Primetals Technologies

ProtoFoisie: Prototyping the Usage of the Foisie Innovation Studio
Morgan Mitchell
Advisors: Curtis Abel (UG), Michael Ginzberg, Arthur Heinricher (MA)

Rheometer Market Analysis
Andrew Burgoyne, Lucas Muntz
Advisors: Kristen Billiar (BME), Frank Hoy

Work Hero
Ryan Leaf, Tim Marschall
Advisor: Soussan Djamasbi
Sponsor: User Experience and Decision Making Lab, WPI

Chemical Engineering

POSTER SESSION, 9am to Noon
Salisbury Labs, Room 402

Bioalcohol Extraction Using Super Critical Carbon Dioxide
Cameron DiSpirito, Eric Stolz
Advisor: Michael Timko

LL37 Antimicrobial Peptide
Yoon Lee, Rachel Smith
Advisor: Terri Camesano

Tailored Synthesis of Bi2S3 Thin Film to Enhance Optoelectronic Performance
Zhehao Zhu
Advisors: Drew Brodeur (CBC), Aaron Deskins, Pratap Rao (ME)

Recharge Ability of a Liquid Metal-Air Battery
Allison Marx, Kelly Rapoza
Advisor: Ravindra Datta

Synthesis of CsSnBr3 Bulk Crystals and Study of its Lewis Basicity
Weiran Gao
Advisor: Ron Grimm (CBC)

Transport Proteins for Taxol
Mariana Harley, Huilin Yang
Advisor: Sue Roberts

Design of Small-Scale Furnace for Fire Resistance Testing of Building Construction Materials
Joseph Igoe (ME), Alexander Ing, Kevin Lynch (ME), Dylan Martel (CEE), Lynn Renner, Tara Sharp (ME), Austin Smith (ME), Steve Thulin (CEE)
Advisor: Nick Dembsey (FPE)
Identification of Organometallic Complexes in Agro-mining Extract
Debora Lopes, Gisele Trivino (EVE)
Advisor: Steve Kmiotek
Sponsor: ENSIC (Ecole Nationale Superieure des Industries Chimiques)

Evaluating Low-Cost Catalysts for Biodiesel Production
Daniel, Bloemker, Marguerite Caray, James Commissio, Daniel Mortimer, Anya Prevallet-Kinstle
Advisor: William Clark

Pilot Testing of Self-Healing Coatings on Structural Concrete
Sebastien Deveau, Max Foster, Logan Nichols, Anna Schab (CEE)
Advisors: Amy Peterson, Aaron Sakulich (CEE)

Process Safety Review of Butanol Extraction
Shannon Healey, Luke Jackson
Advisors: Steve Kmiotek, Mike Timko

Recovery of Metal Catalyst
Elena Conroy, Jessica Lord, Omar Olortegui
Advisors: William Clark, Steve Kmiotek
Sponsor: Sunovion

Electrospun Tissue Engineering Scaffold
Michelle Bleau (BME), Hasson Harris-Wilcher (BME), Ben Haney, Zach Simpson (BME)
Advisors: Shakti Ambady (BME), Amy Peterson

POSTER SESSION, 8:30 to 10:30am
Salisbury Labs, Room 411

Testing the Stability of Cation Exchanged Zeolite ZSM-5 in Hot Liquid Water
Jared Danaher, Caroline Medino, Hope Shevchuck, Mandy Zhang
Advisor: Mike Timko

Metal Cation Adsorption by HydrothermalChars and Lignins
John Hobson, Michael Levy
Advisors: Avery Brown, Mike Timko

Radiation Models for Fixed Beds
Nathan Caso
Advisor: Anthony Dixon

Chemistry and Biochemistry
POSTER SESSION, 9:30 to 11:30am
Rubin Campus Center, Odeum

Development of a Plant Cell Culture Platform for Recombinant Protein Expression
Ryanne Dailey
Advisor: Sue Roberts

Energy Analysis of Butanol Extraction Using Supercritical CO2
Audrey Allen, Sarah Muse
Advisor: Mike Timko

Glucose Hydrothermal Chars: Surface Chemistry and Heavy Metal Adsorption
Abhinav Adhikari, Shaelyn Quinn
Advisor: Michael Timko

Methanol Electrolysis to Produce Hydrogen
Brian Praetorius
Advisor: Ravindra Datta

Triple-Layer Hydrophilic-Hydrophobic Composite Membrane for Desalination Using Direct-Contact Membrane Distillation
Ryan Dennis
Advisors: David DiBiasio, Steve Kmiotek, Susan Zhou
Sponsor: Shanghai Jiao Tong University

Techniques for Modeling and Scaling Liquid-Phase Mixing in Mechanically Agitated Vessels
Sean Deans, Marty Fitzgerald
Advisors: William Clark, Steve Kmiotek
Sponsor: Sunovion Pharmaceuticals

Solid Acids for Biomass
Zachary Burgess, Luke Habib
Advisors: Aaron Deskins, Mike Timko

Smart P & IDS
Alexander Gikas, Anthony Kassas
Advisor: Steve Kmiotek
Sponsor: DPS Engineering

Measurement of Current Distributions in PEM Fuel Cells
Alicia Aquino, Joseph Heng
Advisor: Steve Kmiotek
Sponsor: Francois Lapicque, ENSIC (Ecole Nationale Superieure des Industries Chimique)
The Investigation of Srf-6 and Nsy-1 in 
*C. elegans*
Alexander Hu
Advisor: Samuel Politz (BB)

Investigating the Effects of Vps45 Mutations 
Associated with Severe Congenital Neutropenia 
on SNARE Interactions
Alexandra D’Ordine
Advisors: Destin Heilman, 
Mary Munson (UMMS)
Sponsors: UMMS, WPI

Investigating the Role of Sec6 and RabE During 
Polarized Cell Growth in *Physcomitrella patens*
Allison Butt
Advisors: Destin Heilman, Luis Vidali (BB)
Sponsor: Mary Munson, UMMS

Investigating a Novel Copper Storage Protein in 
*Pseudomonas aeruginosa*
Andrew Baez
Advisor: José Argüello

Single-Base Editing of Cellular mRNA by 
CRISPR/Cas9
Andrew Baker, Kimberly Codding
Advisors: Michael Buckholt (BBT), 
Natalie Farny (BBT)

Calcium Signals in A10 Cells
Androniqi Qifti
Advisor: Suzanne Scarlata

The Role of RUNX2 in Mixed Lineage Leukemia
April Solon
Advisors: Dave Adams (BBT), 
Lucio Castilla (UMMS)
Sponsor: UMMS

To Stress or Not To Stress: Pesticides and 
Cellular Stress Repose
Cecilia Cotter, Miranda Lawell
Advisors: Natalie Farny (BBT), 
Michael Buckholt (BBT)

Determining the Role of Aurora A Kinase and 
Implications of its Inhibition in Acute Myeloid 
Leukemia
Eva Childers, Bernat Navarro Serer
Advisors: Amity Manning (BBT), Destin Heilman

Low-Temperature Electrolysis of 
Mixed Metal Oxides
Everett Baker, Shaun Bonefas, Brittany Kyer, 
Christian Morneau
Advisors: Yan Wang (ME), Shawn Burdette

Synthesis and Evaluation of New HIV-1 
Protease Inhibitors
Jessica Falci
Advisors: James Dittami, 
Akbar Ali (UMMS)
Sponsor: UMMS

Selective Elimination of Microglia 
via Cre-Recombinase
Kyle A Bessette
Advisors: Arne Gericke, Dori Schafer (UMass Med School), Kasey Johnson (UMMS)

The CRISPR Enzyme Cpf1 as a Tool for Gene 
Regulation
Kyle Morrison
Advisors: Destin Heilman, 
Scot Wolfe (UMMS)

Photoelectrochemical Voltage vs Back-Contact 
Barrier Heights
Margaret Ann Russell
Advisor: Ronald Grimm

Novel Antibiotic Isolation and Characterization 
from Soil Bacteria
Matthew Googins, Colin Harrington, 
Parsant Jotikasthira
Advisor: Michael Buckholt (BBT)

Development of Engineered Bacteria for 
Agglutination-based Dengue Detection
Niamh Fennessy, Shelby McQueston, 
Hannah Thompson
Advisors: Michael Buckholt (BBT), 
Natalie Farny (BBT)

Copper-Catalyzed Weak C-H Bond Amination
Nicholas Venditto
Advisor: Marion Emmert

Determining the Origin of Fe3+-induced BOD- 
IPY Probe Fluorescence in Aqueous Solution
Paige Lamica
Advisor: Shawn Burdette

Characterizing Functions of Porcine Circovirus 
Type 1 Viral Protein 3
Paul Burrowes, Christine Carbone
Advisor: Destin Heilman

MRI and Optical Imaging Contrast Agent
Sarah Fields
Advisor: Drew Brodeur, Gang Han (UMMS)
Sponsor: UMMS

Aneurysm Simulation and ELISA Detection 
in Rabbits
Stephanie Puckett, Anna Schozer
Advisor: Drew Brodeur
Sponsor: Alexei Bogdanov, University of 
Massachusetts Medical School, Radiology

Investigation of Bulky Carboxylic Acids and 
Amines as Trapping Agents for Controlling 
Desorption of Molecular Guests from a Porous 
Metal-Organic Framework
U Shwe Thein
Advisor: John MacDonald
The Role of Phosphatidylserine as a Scaffold for Lipid/Protein Complexes  
Vanessa Pinderi  
Advisor: Arne Gericke

Synthesis and Kinetic Analysis of HCV NS3/4a Protease Inhibitors  
Wasih Kamran  
Advisors: Destin Heilman, Akbar Ali (UMMS)  
Sponsor: UMMS

The Role Mitochondria Play in Neuronal Cell Differentiation  
Whitney Davis  
Advisor: Suzanne Scarlata

Tailored Synthesis of Bi2S3 Thin Film to Enhance Optoelectronic Performance  
Zhehao Zhu  
Advisors: Pratap Rao (ME), Aaron Deskins (CHE), Drew Brodeur

Civil Engineering

POSTER SESSIONS, 1:15 to 3:30pm  
*AE majors  ** FPE majors

Kaven Hall, 1st Floor Hallway

An Alternative Design of the Foisei Innovation Studio and Messenger Residence Hall with Podium Construction  
Dylan Roche*, Bruno Scherrer*  
Advisors: Leonard Albano, Soroush Farzinmoghadam

An Alternative Envelope Design for Boston Children's Hospital Garage  
Naumilda Como*  
Advisor: Steven Van Dessel  
Sponsor: Stantec Inc.

Boston Children's Hospital Construction Management Plan  
Tyler Leighton, Kenuel Lopez Rivera, Tyler Van Nostrand (EVE), Kevin Wormer  
Advisor: Suzanne LePage  
Sponsor: Stantec Inc.

Design of an Architectural Engineering Department Building for Worcester Polytechnic Institute  
Meghan Hickey*, Kimberly Marrion*, Cassandra Tomerlin*, Marc Toomajian*  
Advisors: Leonard Albano, Kenneth Elovitz, Leffi Cewe-Malloy, Soroush Farzinmoghadam

Development of an Auxetic Material for Construction  
Christopher Zmuda  
Advisor: Nima Rahbar

Evaluation of a Solar Water Heating System for Zero Energy Design  
Ysabel Espinal*, Ismael Nowick*, Leanne Sickles*  
Advisor: Steven Van Dessel

Fire Performance of Glass Curtain Walls  
Joycelyn De La Rosa*, Yijie Lu*  
Advisor: Steven Van Dessel

Green Design Alternatives for New Water Treatment Plants in Parker, Colorado  
Geneva Cabral, Miguel Escuer Velasquez, Robyn Quartararo, Ahsan Aadil Nizam Shaikh  
Advisors: Leonard Albano, Suzanne LePage  
Sponsor: Stantec Inc.

Hubbardston Complete Streets Design  
Alexander Bosworth, Sarah Campos  
Advisor: Suzanne LePage  
Sponsor: Town of Hubbardston

Integrated Structural and Fire Protection Considerations in Building Design  
Elizabeth Coffey, Emma Healey  
Advisor: Leonard Albano

Investigation of the Thermal Properties of Rice Husk Ash in Cement  
Brendan Johnson, Serena Soltero, Daniel Stomski, Abbey Teliska  
Advisor: Aaron Sakulich

Mass Timber in Tall Building Design  
Michael Fager-Thompson, Emanuela Sherifi  
Advisor: Nima Rahbar

Kaven Hall, 116

Design of a Small-Scale Furnace for Fire Resistance Testing of Building Construction Materials  
Advisor: Nicholas Dembsey

Materials Fire and Thermal Properties — Low E Windows  
Advisor: Nicholas Dembsey

North Lake Ave Bridge Design  
Ryan Cavanaugh, John Connors, Jibreel Mustafa, Ryan Sullivan  
Advisors: Leonard Albano, Mingjiang Tao

Pedestrian Bridge Design and Institute Park Improvements  
Emily Raskett, Brittany Rebello  
Advisor: Leonard Albano
Pilot Testing of Self-Healing Coatings in Structural Concrete
Deveau Sebastien (CM), Maxwell Foster (CM), Logan Nichols (CM), Anna Schab
Advisors: Amy Peterson (CM), Aaron Sakulich

The Role of BIM in a Collaborative Approach for Design and Construction at the Foisie Innovation Studio
Christian Doskocil, Michael Vaitkunas
Advisor: Guillermo Salazar
Sponsor: Shawmut Design & Construction

Structural Bridge Design and Construction
Traffic Management Plan for the Route 24/140 Interchange (28)
Anjali Kuchibhatla, Carolina Leguizamón, Maitane Sesma
Advisors: Leonard Albano, Suzanne LePage
Sponsor: Stantec Inc.

Kaven Hall 204

Responding to Challenges Following the Panama Canal Expansion Project: Analysis of Chemical Consumption Patterns at Miraflores Filtration Plant
Liliana Almonte, Sonia Zarate
Advisor: Aaron Sakulich
Sponsor: Autoridad del Canal de Panama (ACP)

Responding to Challenges following the Panama Canal Expansion Project: Evaluation of the ACP’s Formal Inspection Program of Dams and Spillways
Caitlin Burner
Advisor: Aaron Sakulich
Sponsor: Autoridad del Canal de Panama (ACP)

Responding to Challenges following the Panama Canal Expansion Project: Process Analysis of Mount Hope Water Filtration Plant
Julia Ring
Advisor: Aaron Sakulich
Sponsor: Autoridad del Canal de Panama (ACP)

Responding to Challenges following the Panama Canal Expansion Project: Risk Analysis of Madden Dam and Spillway Drum Gates
Victoria Simpson
Advisor: Aaron Sakulich
Sponsor: Autoridad del Canal de Panama (ACP)

Computer Science

POSTER SESSION, 10:00am to Noon
Fuller Labs, 3rd Floor Hallway and Classrooms

Using Image Recognition Technology as a Gameplay Mechanic
Thomas Meehan, Yahel Nachum, Andrew Ray
Advisors: Brian Moriarty (IMGD), Charles Rich

AlcoWatch
Andrew McAfee, Jacob Watson, Benjamin Bianchi
Advisor: Emmanuel Agu

Benchmarking Big Data Cloud-Based Infrastructures
Kurt Bugbee, Jeff Chaves, Dan Seaman
Advisor: Mohamed Eltabakh

Cyber Security Network Anomaly Detection and Visualization
Heric Flores Huerta, Jacob Link, Cassidy Litch
Advisors: Lane Harrison, Randy Paffenroth (MA)

Cypress Exergame Enjoyment
Joshua Audibert, Elijah Gonzalez, Ryan Orlando, Nicholas Wong
Advisors: Emmanuel Agu, Mark Claypool

Data Analytics Models and Pipeline Development for Anomaly Detection
Ziyan Ding, Erin Esco, Alexander Huot, Yihong Zhou
Advisors: Eugene Eberbach (RBE), Elke Rundensteiner, Jian (Frank) Zou (MA)
Sponsor: ACI Worldwide

Designing and Simulating a Nuclear Reactor in Fortran
Sultan Jilani, Ivan Melnikov
Advisors: David Medich, Craig Wills

Detecting Solution Structures in Plan Composition Problems
Ben McMorran
Advisor: Kathi Fisler

Detruncation of Attenuation Maps Using Neural Networks
Daniel Beckwith, Aditya Nivarthi, Akshay Thejaswi
Advisors: Emmanuel Agu, Clifford Lindsay
Sponsor: UMMS

Disease Tracking EHR for Medical Facilities in Ghana
Ebenezer Ampiah, Alexander Kasparek, Dominik Smreczak
Advisor: Wilson Wong
Find and Assign
Christian Roberts
Advisors: Neil Heffernan, Cristina Heffernan

Hira Hero: Learning Hiragana Fluency Through Gameplay
Yuheng Huo, Jesse Marciano, Adam Myers
Advisors: Jennifer deWinter (IMGD), Charles Rich
Sponsor: Osaka University
Project Center: Japan Project Center

Intelligent Visualization of Holographic Biological Network Using HoloLens
Vakhtang Margvelashvili, Jonathan Sawin, William Van Rensselaer
Advisor: Dmitry Korkin

Design and Authorship for the Halberd Narrative Planning Engine
Richard Hayes, Myles Karam, Jonas McGowan-Martin, Brian Rubenstein, Gareth Solbeck
Advisors: Mark Claypool, Charles Rich

Performing Transaction Synthesis through Machine Learning Models
Justin Charron, Li Li, Yudi Wang, Shihao Xia
Advisors: Elke Rundensteiner, Yanhua Li
Sponsor: ACI Worldwide

Predicting Ischemic Stroke Recovery with Data Mining
Theresa Inzerillo, Preston Mueller
Advisors: Sergio Alvarez (Boston College), Carolina Ruiz

Synthesizing Mobile Games with Combinators
Joseph Blackman, Dean Kioroutsis, Bailey Sheridan
Advisor: George Heineman

The Conduit’s Garden
Alex Guerra, John Nelson, Paul Orvis
Advisors: Jennifer deWinter (IMGD), Charles Rich
Sponsor: Takemura Labs at Osaka University
Project Center: Japan Project Center

Visualizing Contextual Information for Network Vulnerability Management
Andrew Mokotoff, Zachary Robbins, Barrett Wolfson
Advisor: Lane Harrison

Windows GUI Context Extraction
Austin Rose
Advisor: Craig Shue

POSTER SESSION, 1:00 to 3:00pm
Fuller Labs, 3rd Floor Hallway and Classrooms

5 Axis 3D Printing
Ethan Coeytaux, Cameron Crook, Alexandre Pauwels, Hugh Whelan
Advisors: Diran Apelian (ME), George Heineman, Craig Putnam (RBE), Gabor Sarkozy

Adaptive Bitrate Streaming and Cloud Gaming
Robyn Domanico, Matthew Suarez, Lambert Wang
Advisor: Mark Claypool

Alco-Contextualizer
Rupak Lamsal, Matthew Nguyen, Jules Voltaire
Advisor: Emmanuel Agu

Application of Data Analytics to Cyber Forensic Data
Yao Chow
Advisors: George Heineman, Randy Paffenroth (MA)
Project Center: MITRE

Augmented DIAMOnD: A Method for Improving Disease Networks Among Human Genes
Kevin Specht
Advisors: Dmitry Korkin, Zheyang Wu (MA)

Autonomous Cargo Aircraft Project
Erik Nadel, Tyler Nickerson, Nicholas Bradford
Advisors: Michael Ciaraldi, Fred Looft (ECE)

BNP Paribas: Budget Automation
Nan Zhang
Advisor: Michael Ciaraldi
Sponsor: BNP Paribas
Project Center: Wall Street Project Center

Citizen Science Bee Ecology
Jackson Oliva
Advisors: Robert Gegear (BBT), Carolina Ruiz, Elizabeth Ryder (BBT)

Cloud-Based Infrastructure for Educational Deep Learning
Nicholas Diaz, Cameron Jones
Advisor: Neil Heffernan

Continuous Behavioral Mobile Authentication
Arun Donti, Arthur Dooner, Walter Ho, Stephen Lafortune
Advisor: Emmanuel Agu

Deep Learning for Intelligent Transportation
Mengwen Li, Javier Menchaca
Advisors: Xinming Huang (ECE), Emmanuel Agu
Electrical and Computer Engineering

Atwater Kent Labs, Room 219

10:00am
AK Power Panels
Bernardino Garay, Clara Merino, Raphael Sarkar, Sonam Sherpa
Advisor: Shamsur Mazumder

10:30am
Maximum Power Point Tracking
Yejee Choi, Monineath Khun, Giselle Verbera
Advisor: Alexander Emanuel

10:45am
Smart Recloser
Hung Ngo
Advisor: Alexander Emanuel

11:15am
Pressure Ulcer Prevention System
Amanda Agdeppa, Syed Hussain, Hyunsoo Kim, Victoria Loehle
Advisors: John McNeill, Shamsur Mazumder, Stephen Bitar, Yitzhak Mendelson (BME), Walter Towner (BUS)
Sponsor: NECAMSID Lab

11:30am
Autonomous Cargo-Aircraft Project
Erik Nadel, Benjamin Gillette, Nicholas Cyganski, Killian Henson, Keshuai Xu, Xavier Little
Advisors: Fred Looft, Michael Ciaraldi (CS)
Sponsor: ACAP

11:45am
Smart Home Energy Controller
Erik Meier, Andrew Reyburn
Advisor: Fred Looft

12:00pm
Using iBeacon for Navigation and Proximity Awareness in Smart Buildings
Qusai Alhumoud, Cristopher Connor, David Goodrich
Advisors: Kaveh Pahlavan, Jahangir Rahman

1:00pm
Layout Design and Simulation of a VCO-Based ADC
Yue Lie, Julia Szemiot, Htay Win
Advisor: Stephen Bitar
Sponsor: NECAMSID Lab

1:15pm
Smart Snow Meter
Arturo Cardoni, Melissa Rivera, Sean Watson
Advisor: Stephen Bitar

1:30pm
Efficient LED Headlight Heating System
Daniel Bettigole, Jacqueline Campbell, Nicholas Comei
Advisors: Stephen Bitar, Shamsur Mazumder

1:45pm
Music and Wearable Tech
Matthew Barreiro, Erin Ferguson, Liam Perry
Advisor: William Michelson
2:15pm
Encoding and Physical Study of the CANbus Sensor Network
Klaudia Línek, Anna Hernandez
Advisor: Alexander Wyglinski

2:30pm
Goat Cart: The Autonomous Golf Cart
Kyle Cederberg, Rebecca Dall’Orso, Calvin Figuereó-Supraner, Patrick Long
Advisor: Alexander Wyglinski

2:45pm
Binary Analysis and Symbolic Execution with angr
Eric Cheng
Advisor: Alexander Wyglinski

3:00pm
Analyzing Computer Architecture of Intel Processors for Time Critical Applications
Amanda Gatz
Advisor: Alexander Wyglinski

3:15pm
A Multi-Purposed Aerial Software Defined Radio Platform
Narut Akadejdechapanich, Scott Iwanicki, Max Li, Kyle Piette, Jonas Rogers
Advisor: Alexander Wyglinski

3:30pm
Cybersecurity
Rosemary Lindsay, Alexander Hebert, Chandler Reynolds, Kyle Stack, Joy Tartaglia
Advisors: Lee Sheldon (CS), Alexander Wyglinski, Lane Harrison (CS)

Atwater Kent Labs, Room 233

10:00am
Deep Learning for Int Tr
Javier Menchaca Gallegos, Mengwen Li
Advisors: Xinning Huang, Emmanuel Agu (CS)
Sponsor: Mathworks

10:15am
IoT for Smart Health
Maria Rios-Martínez
Advisor: Xinning Huang

10:30am
Coffee Can Radar: Detection and Jamming
Michael Inserra, Daniella Morico, Gabriela de Peralta
Advisor: Alexander Wyglinski
Sponsor: NECAMSID Lab

10:45 am
RSS-Based 3D Drone Localization and Performance Evaluation
Zilu Tian
Advisor: Kaveh Pahlavan, Suzanne Weekes (MA)

11:15am
Virtual Human Male Model
Patrick Lacroix, Nicholas Maino
Advisors: Sergey Makarov, Gregory Noetscher

11:30am
FEA of TMS Case Study
Edward Burnham
Advisor: Sergey Makarov
Sponsor: Mass General Hospital

11:45am
Design and Development of Myoelectric Transradial Prosthesis
Steven Souto
Advisors: Sergey Makarov, David Planchard (ME)

12:00pm
An Exploration of Maximum Power Point Tracking
Johnathan Adams, Benjamin Beauregard, Andrew Flynn
Advisor: Alexander Emanuel

1:00pm
SAR Drone Sensor Suite
Andrew Kelleher, Austin Kosin, Joshua Ledee, Bryan Sellers
Advisor: Susan Jarvis

1:15pm
Universal Evaluation Platform
Dylan Baranik, Sagar Mahurkar, Jorgo Mihallari, Erik Paulson
Advisor: Susan Jarvis, Jahangir Rahman

1:30pm
Automatic Weapon Detection (AWeD)
Georgios Karapanagos, Carlos Monterrosa-Diaz, Glen Mould, Skyler Alsever, Paul Raynes
Advisors: Susan Jarvis, Nicholas Bertozzi (RBE)

1:45pm
Dynamic Volume Adjuster
Stephen Blouin, Anthony Ratte, Samuel Shurberg, Samuel List
Advisor: Berk Sunar

2:15pm
Smart Home System
Thinh Ly, Anh Tran, Duc Tran
Advisor: Reinhold Ludwig
2:30pm
MRI Compatible Optical Force Sensor
Brian Hecker, James Maliff,
Lumbini Parnas, Corin Rypkema
Advisors: Gregory Fischer (RBE),
Cosme Furlong-Vazquez (ME)

2:45pm
Solar Maximum Power Point Tracking
Joseph Agresta, Nicole Mikolajczak
Advisor: Fred Looft

3:00pm
Volumetric Display Research
Roger Santos, Oliver Simon
Advisor: James Duckworth

3:15pm
iBeacon Attendance Monitoring
Raymond Otieno, Savannah Redetzke,
Andrew Vanner
Advisor: Kaveh Pahlavan, Jahangir Rahman

Environmental Engineering

POSTER SESSIONS, 1:15 to 3:30pm
Kaven Hall 2nd Floor Hallway

An Evaluation of the Living Systems Laboratory’s Capacity to Treat Stormwater
Sierra Fraioli, Nathan Meersman, Evan Pereira
Advisors: Paul Mathisen, Derren Rosbach

Analysis of the Decentralized Wastewater Treatment System at Woodlands Village
Julia Bushell (CM), Sierra Fowler (CM),
Matthew Houghton, Abbegail Nack (CM),
Chris Xavier (CM)
Advisor: Suzanne LePage
Sponsor: Woodlands Village Condominium Development

Coes Pond Stormwater Management
Brendan Kling, Adam Weiss
Advisor: Paul Mathisen
Sponsor: Tatnuck Brook Watershed Association

Designing a Constructed Wetland to Improve Water Quality in Framingham, Mass.
Cara Bereznai, Anna Franciosa,
Kathryn Murphy, Jacqueline Tedesco
Advisor: Paul Mathisen

Environmental Effects of Coal Tar-Based Pavement Rejuvenators
Seth MacDonald, Caroline Meyer
Advisor: John Bergendahl

Evaluating the Role of Stormwater Treatment Basins in Controlling Highway Runoff Quality
Elizabeth Desjardins, Julia Scott, Anna Valdez
Advisors: Suzanne Le Page, Paul Mathisen

Exploring the Potential for Reclaimed Wastewater Applications: Designing a Feasible and Beneficial Reuse Process for the Upper Blackstone Water Pollution Abatement District
Jenna O’Connell (CM), Mary Prescott,
Meghan Trahan
Advisors: John Bergendahl, Stephen Kmiotek (CM),
Wayne Bates

Measuring CO2 Flux in Highway Buffer Zones
Annie McDonald-Schwartz, Matthew Michaels,
Nicholas Santangelo, Alexis Sturgis
Advisors: John Bergendahl, Rajib Mallick

Restoration of the Walker Street Culverts in Norton, Massachusetts
Jackson Krupnick, Julia Pershken
Advisor: Paul Mathisen
Sponsor: Town of Norton, Mass.

Salinity Impacts on Coastal Wastewater Treatment
Amy Krayer, Matthew Michaels (CM),
Talia Solomon
Advisor: John Bergendahl

Humanities and Arts

Higgins House, Library

12:30pm
WPI & Diversity Competency: Developing an Inclusive and Diverse Community on Campus Creates Effective Engineers
Gyneth Campbell
Advisor: Peter Hansen

12:50pm
Speaking Denglish: Exploring the Impact of Denglish and Anglicisms in German Culture and Identity
Leah Holt
Advisor: Ulrike Brisson

1:10pm
History of Nuclear Weapons
Samantha Gauthier
Advisor: Peter Hansen

1:30pm
Feasibility of Digitizing LEI Evaluations with an Internationalized ASSISTments
Bryce Kaw-uh
Advisors: Aarti Madan, Neil Heffernan (CS)
Sponsor: Latino Education Institute WSU
1:50pm
Relieving Anxieties in the Pre-Modern and Industrial World
Carolina Ramos
Advisor: Bland Addison

2:10pm
The International Dimensions of Water Recycling at the American Farm School (Greece)
Nikos Kalaitzidis
Advisor: Bland Addison
Sponsor: The American Farm School in Thessaloniki, Greece

Interactive Media & Game Development
Fuller Labs, Lower Perreault

1:00pm
Design and Authorship for the Halberd Narrative Planning Engine
Richard Hayes, Myles Karam, Jonas McGowan-Martin, Brian Rubenstein, Gareth Solbeck
Advisors: Mark Claypool, Charles Rich, Ryan Madan (PW)

1:15pm
Cybersecurity Game
Alex Hebert, Rosemary Lindsay, Chandler Reynolds, Kyle Stack
Advisors: Lee Sheldon, Lane Harrison

1:30pm
The Conduit’s Garden
Alex Guerra, John Nelson, Paul Orvis
Advisors: Jennifer deWinter, Charles Rich
Sponsor: Osaka University Project Center (Japan)

1:45pm
Battle Patrol
Christopher Dowding, Thomas Lourenco
Advisors: Brian Moriarty, Ralph Sutter

2:45pm
Hira Hero: Learning Hiragana Fluency Through Gameplay
Yuheng Huo, Jesse Marciano, Adam Myers
Advisors: Jennifer deWinter, Charles Rich
Sponsor: Osaka University Project Center (Japan)

3:00pm
Mathspring for Latinx Students
Student: Rachel Burton
Advisors: Alexandrina Agloro, Ivon Arroyo

3:15pm
Sustainable Aquaculture Game
Students: Liam Miller, Michel Sabbagh
Advisors: Brian Moriarty, Ralph Sutter

3:30pm
A Gamified Approach to Academic Learning in a High School Biology Curriculum
Samuel Conley
Advisor: Lee Sheldon

3:45pm
ARIN
Graham Held, Isabella Schiavone, Matthew Thompson, Dongjie Wang
Advisors: Jennifer deWinter, Ralph Sutter

4:00pm
Physical Games for Learning II
Matthew Micciolo
Advisor: Ivon Arroyo

4:15pm
Step Symphony
Marco Duran, LilyAnne Lewis, Sienna McDowell
Advisor: Jennifer deWinter
Sponsor: Ritsumeikan University Project Center (Japan)
Mathematical Sciences
Higgins Labs, Room 218

9:00am
Flexible Infrastructure Supporting Machine Learning for Anomaly Detection in Big Data
Ziyan Ding, Erin Esco, Alexander Huot, Yihong Zhou
Advisors: Jian Zou, Elke Rundensteiner (CS)
Sponsor: ACI Worldwide

9:15am
RSS-Based 3D Drone Localization and Performance Evaluation
Zilu Tian
Advisors: Suzanne Weekes, Kaveh Pahlavan (ECE)

9:30am
Kirchhoff Graph Construction
Marcel Gietzmann-Sanders
Advisor: Joseph Fehribach

9:45am
Process Mining the Credit Suisse Advisory Process
Shannon Feeley, Gina Rios
Advisors: Randy Paffenroth, Stephan Sturm

10:00am
Modeling Over-the-Counter Derivative Trading with and without Central Clearing Parties
Natalie Wellen
Advisor: Stephan Sturm

10:15am
Quasiconformal Gradient Flows
Weizhe Shen
Advisor: Luca Capogna

10:30am
A Mathematical Analysis of Zeolites
Yani Lindbergh DeAraujo
Advisor: Brigitte Servatius

10:45am
Application of Data Analytics to Cyber Forensic Data
Yao Yuan Chow
Advisors: Randy Paffenroth, George Heineman (CS)
Sponsor: MITRE Corporation

11:15am
Modeling-Backed Microwave Imaging in Closed Systems: Reconstruction of a Spherical Inhomogeneity
Taylor York
Advisor: Vadim Yakovlev
Sponsor: MACOM

11:30am
Enhancing Career Opportunities: Using Supervised Learning to Analyze Career Outcomes Data
Sadie Gauthier, Zachary Peters, Robert Vigeant, Emily Weber
Advisor: Randy Paffenroth
Sponsor: Dave Ortendahl, CDC

11:45am
Symmetric, Informationally Complete, Positive Operator Valued Measures
Junjiang Le
Advisors: William J. Martin, P. K. Aravind (PH)

12:00pm
Quantum Algorithms from a Linear Algebra Perspective
Lauren Baker, Liam Ogren
Advisors: William Martin, P. K. Aravind (PH)

12:15pm
Acoustically Enhanced Cooling of Thin Fluid Sheets
Thomas deRito
Advisor: Burt Tilley

12:30pm
Cyber Security Network Anomaly Detection and Visualization
Heric Flores, Jacob Link, Cassidy Litch
Advisors: Randy Paffenroth, Lane Harrison (CS)

12:45pm
Investigating Whether a Social Media Presence Impacts Claim Severity
Elizabeth Beazley, Katherine Curran, Anton Libsch, Robert Ronacher
Advisor: Jon Abraham, Barry Posterro
Sponsor: Hanover Insurance Group

1:00pm
Projecting the Ultimate Loss of Catastrophic Events
Siro Fritzmann, Elizabeth Hansen, Amber Munderville, Mike Sullivan, Tyler Turchiarelli
Advisors: Jon Abraham, Barry Posterro
Sponsor: Hanover Insurance Group
**Mechanical Engineering**

**POSTER SESSION: 8:30 to 11:30am**

Alden Memorial, Great Hall

### Biomechanical Engineering

**Design of a Transfer Device for an Eight-Year-Old Student**  
Lindsey Andrews, Jonathan Rheaume, Yingzhe Zhao  
Advisors: Holly Ault, Allen Hoffman

**Synthesizing an Artificial Hand for Tasks Requiring Fine Motor Control**  
Caitlin Grow  
Advisor: Pradeep Radhakrishnan

**Equine Lung Function Testing**  
Lucy Garvey, Lubna Hassan, Kyla Nichols, Allison Paquin  
Advisors: Marsha Rolle (BME), Robert Daniello  
Sponsor: Dr. Melissa Mazan, Cummings School of Veterinary Medicine at Tufts University

**Designing a Biomimetic Prosthetic Flipper for a Kemps Ridley Sea Turtle**  
Frederick Burgwardt, Paul DePlacido, Andrew Dunne, Christopher Ryan, William Pope, Aryelle Teixeira  
Advisor: Brian Savilonis

**Improved Backpacking Load Carriage System**  
Delaney Cassidy, Emma Healey, Kimberlee Kocienski, Benjamin Pulver  
Advisor: Brian Savilonis

**Finite Element Analysis and 3-D Printing of the Shoulder Joint and Glenohumeral Labral Tears**  
Kenneth Swanson  
Advisor: Satya Shivkumar

**Designing a Passive Knee Brace for Sit-to-Stand Assistance**  
Ethan Paul  
Advisor: Karen Troy (BE)

### Design

**Design of a Customizable Assistive Utensil Grip**  
Kyle Fitzgerald, Adam Huber, Winton Parker  
Advisors: Holly Ault, Allen Hoffman

**Design and Analysis of Cognitive Focus Devices**  
Brianna Fogal, Connor McGrath, Carolina Ramos, Ashley Stanley, Daniel Sturman  
Advisors: Torbjorn Bergstrom, Walter Towner (MG), Bland Addison (HU), Helen Vassallo (MG)

**Designing and Building a Ski Binding Tester**  
Jesse Kablik  
Advisor: Christopher Brown

**Multi-Mode Load-Limiting and Absorptive Ski Binding**  
Jacob Billington, Jonathan Comden, Sean Regan, Thomas Roberti  
Advisor: Christopher Brown

**Extendable Pedal Car**  
Matthew Farrell, Alexa Stevens, Zachary Styer  
Advisor: Eben Cobb

**Quick Return Mechanism**  
Zach Belohoubek, Ellyn Webber  
Advisor: Eben Cobb

**Table-Top Demonstration Device**  
Charles Bleakney, Jarrod Peloquin  
Advisor: Eben Cobb

**Trash Lifter**  
Erin Bracken, Ian Converse, Michael Duclos, Austin Scott  
Advisor: Eben Cobb

**Developing the Ice Device**  
Anthony DiBacio, Zoe Eggleston, Alexander Grammenos  
Advisor: Robert Daniello

**Micro-Hydro Intake and Greenhouse Design**  
Aaron McGinnis, Paige Myatt, Nathan Peterson  
Advisors: Robert Daniello, Steve Kmiotek (CHE)  
Sponsor: Te Runanga o Ngāti Kea Ngāti Tuara of Horohoro, New Zealand

**Design of a Hand Orthosis**  
Connor Kurtz, John Mulready, Steven Murphy, Tyler Tao  
Advisors: Allen Hoffman, Holly Ault

**Optical Chopsticks**  
Isaac Coelho, Matthew Haley  
Advisor: Yuxiang Liu

**Optical Conveyor Belt**  
Brandon Bozeat, Jonathan Stump  
Advisor: Yuxiang Liu

**Autonomous Aircraft Retrofit**  
Karl Sundberg  
Advisor: Fred Looft (ECE)

**Summer Kite Power 2**  
Andrew Bauer, Christopher Beauchemin, Alexander Draper, Obadiah Munene, Jonathan Van Blarcum, Hanqing Zhao  
Advisor: David Olinger

**3D Printing Thermal Expansion**  
Connor Barrett, Joseph Presing  
Advisors: Amy Peterson (CHE), Anthony D’Amico (CHE)
Design and Development of a Myoelectric Transradial Prosthesis
Cameron Currie, Cameron Downey, David McDonald, Rae Nistler, Gregory Port, Joseph Sabatino, Steven Souto
Advisors: David Planchard, Tiffany Butler (BME), Sergey Makarov (ECE), Craig Putnam (CS)

Design and Optimization of a SAE Baja Chassis
Heather Selmer, Sabrin Shweiki, Paige Tencati
Advisors: David Planchard, John Hall

Design of a Personal Aerial Vehicle
Matthew Lepine
Advisors: David Planchard, John Hall

Optimization and Design of an FSAE Frame and Suspension
David Powers, Jonathan Ross, Constantine Scaperdas, Christian Storbel
Advisors: David Planchard, John Hall, Kevin Sweeney (MG)
Sponsor: SAE

Developing Automated Design and Analysis Tools
Corey Alicchio, Callum Taylor, Justin Vitiello
Advisor: Pradeep Radhakrishnan

Developing Methods and Graph Representations for Automated Design of Gear Trains
Penelope Belliard, Ruizhe Chen, Yingjie Lu
Advisors: Pradeep Radhakrishnan, David Brown (CS)

Terahertz Testing Fixture
Andrew Belz, Michael Cournoyer, Anthony Lawinger
Advisors: Pratap Rao, Lyubov Titova (PH)

Towards the Optimization of a Fin-Based Hydropower Generator
Casey Broslawski, Frank DeGiacomo, Keaton Goddard, Christopher Parisi
Advisor: Brian Savilonis

The Synthesis and Design of a Small Speaker System
Shawna McGaffigan, Ryan Smolenski
Advisor: Joseph Stabile

Design and Build an Innovative 3D Printer
Alex Beaudoin, Nicholas Borowski, Robert Boulanger, Paul Danielson, Jessica DiPersio, William Gorman, Cameron Hastings, Daniel Pfaff, Michael Wray
Advisor: John Sullivan

Engineering Experimentation Module Designs
Peter Ofsthun, Elizabeth Thompson
Advisor: John Sullivan

Fetching Interactive Dog Occupier (FIDO)
Joseph Alvarado, Bianca Espinoza, Johnly Lin, Doon Nordemann, Tiana Vasquez
Advisor: John Sullivan

Revamping ME3901 for Modular Distribution
Jeffrey Brathwaite
Advisor: John Sullivan

Manufacturing

Analysis of Edge Curvature and Roughness in Slicing
Jake Porrazzo, Michael Sheahan, Scott Spear
Advisor: Christopher Brown

Materials

Development of an Experimental Optimization Method in Laser-Assisted Cold Spray
Sean Hathaway, Mikhail Khibkin, Matthew Nicholson
Advisor: Diran Apelian
Sponsor: IPG Photonics

Design of Small-Scale Furnace for Fire Resistance Testing of Building Construction Materials
Joseph Igoe, Xander Ing, Kevin Lynch, Dylan Martel, Lynn Renner, Tara Sharp, Austin Smith, Steve Thulin
Advisor: Nicholas Dembsey (FPE)

Crack Detection Using Wavelets
Theofilos Gatsos
Advisor: Zhikun Hou

Transport Properties Measurements in Aluminum Alloys
Gyneth Campbell, Scott Davison, Adam Gatehouse, Daniel Mortarelli
Advisors: Diana Lados, Germano Iannacchione (PH)

Assessing Carbon Footprint
Richard Coffin, Matthew Puksta, Muhammad Siddiq, Antonio Aimilios Tachiaos
Advisor: Brajendra Mishra
Sponsor: Automotive Recyclers of Massachusetts

Fabrication and Properties of Novel Polymer-Metal Composites Using 3D Printing
Daniel Braconnier, Kristin Markuson, Mila Maynard
Advisors: Amy Peterson (CHE), Diana Lados, Germano Iannacchione (PH)

Flexible Solar Cell
Francis LaRovere, Michael McMahon, Edward Peglow
Advisors: Pratap Rao, Cagdas Onal
**Robotics Engineering**

**Dexter: Assistive Intelligence for Transradial Amputees**
Sienna Mayer, Gabrielle O’Dell, Yesugey Sipka
Advisors: Cagdas Onal, Kristen Billiar (BME), William Michelson (ECE)

**Humanoid Stereoscopic Vision System**
Tyler Chaulk, Rodrigo Rivas, Ann Votta, Jacob Wennersten
Advisors: Cagdas Onal, Holly Ault

**Accurate Prosthetic Hand**
Casey Kracinovich, Mervyn Larrier, Dylan Renshaw, Elina Saint-Elme
Advisor: Marko Popovic (PH)

**Robodog**
Yunda Li, Michael Pickett
Advisors: Marko Popovic (PH), Pradeep Radhakrishnan

**Robotic Mining Platform**
Dom Bozzuto, Rene Jacques, Aaron Jaeger, Brian Peterson, Yu-sen Wu
Advisors: Ken Stafford, Michael Ciardaldi (CS)

**Thermofluids**

**Modular Geothermal Heat Pumps**
Veronica Delaney, Zachary Ericson, Keirsten Field
Advisors: Robert Daniello, Christopher Scarpino

**Materials Fire and Thermal Properties — Low E Windows**
Perry Ascani, Garrett Curran, Sai Sett Paing, Madelyn Werth
Advisor: Nicholas Dembsey (FPE)

**Vortex Tube Cooling System**
Devin Duarte, Kimberly Rosa, Daniel Ruiz-Cadalso
Advisor: Cosme Furlong

**Design and Construction of an Advanced Solvent Recycling System (Acetone Distiller)**
Travis Simoneau
Advisors: Selçuk Güçeri, Stephen Kmiotek (CHE)

**Synthesis of an Air Manifold for an Adaptive Suspension System**
Jake Nieto, Jorge Santana
Advisors: Pradeep Radhakrishnan, Robert Daniello

**Harvesting Hydrokinetic River Current Power**
Megan Belval, Hallie Kenyon, Robert LaFlamme, Sarah Putnam
Advisor: Brian Savilonis

**Vortex Induced Vibration Energy Harvesting Through Piezoelectric Transducers**
Natalie Diltz, Julie Gagnon, Jacqueline O’Connor, Jessica Wedell
Advisor: Brian Savilonis

**Next Generation, Smart Fluid Storage Tank for Space and Terrestrial Applications**
Jon Barruetabena, Connor McGuirk, Lily Ouellette
Advisor: Jamal Yagoobi

**Physics**

**Olin Hall, Room 107**

**8:30am**
Gen IV Neutron Reactor Design
Sultan Jilani and Ivan Melnikov
Advisors: David Medich, Craig Wills (CS)

**8:45am**
Finite Element Modeling of Finite Single and Double Quantum Wells
Yuchen Wang
Advisors: Padmanabhan Aravind, Ramdas Ram-Mohan

**9:00am**
Survey and Analysis of 1st Year Physics Labs for Selected Colleges
Wesley Bellerman
Advisor: Frank Dick

**9:15am**
Terahertz and Optical Spectroscopy of Rare Earth Doped Materials
Ben Dringoli
Advisors: Richard Quimby, Lyubov Titova

**9:30am**
Ytterbium Neutron Cross Section
Norbert Hugger
Advisor: David Medich

**9:45am**
Finite Element and QFT
Muping Chen
Advisor: Ramdas Ram-Mohan

**10:00am**
Multiphase Metallic Diffusion
Rui Yu
Advisors: Ramdas Ram-Mohan, Marcus Sarkis-Martins (MA)
10:15am  
Holographic Hawking Effect  
Dominic Chang  
Advisors: Leo Rodriguez (Assumption College), Shanshan Rodriguez

10:45am  
A First Principle's Approach to Propeller-Intrinsic Losses  
Stephen Olis  
Advisor: Marko Popovic

11:00am  
Simulating Tau Neutrino Events in the IceCube Array  
Mykalin Jones  
Advisors: Frank Dick, David Medich, Shaun Marshall (grad student)  
Sponsor: IceCube Neutrino Telescope

11:15am  
Brachytherapy with Ytterbium-169  
Sergey Korkhov  
Advisor: David Medich

11:30am  
Removal of Accidental Degeneracy in Cubic Quantum Dots  
Christopher Pierce  
Advisor: Ramdas Ram-Mohan

11:45am  
Surface Undersea Kites for Power Generation  
Peter Melander  
Advisors: Nancy Burnham, David Olinger (AE)

12:00pm  
Fiber Optic Tweezers for Cell Studies  
William Beatty  
Advisor: Qi Wen

12:15pm  
Brain SPECT Collimator Design  
Yulun He  
Advisors: Zhikun Hou (ME), David Medich  
Sponsor: Dr. Michael King, UMass Medical School

12:30pm  
Evaluation of Intensity Modulated Brachytherapy Using Ytterbium-169  
Amanda Leahy  
Advisors: David Medich

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Professional Writing

POSTER SESSIONS  
11:30–12:30 / 2:30–3:30  
Higgins House, Great Hall

Creating an Online Introductory Guide to Biomedical Grant Proposals  
Alexandra D’Ordine  
Advisor: Lorraine Higgins

Kimberly Codding  
Advisor: Brenton Faber

Design and Authorship for the Halberd Narrative Planning Engine  
Richard Hayes  
Advisors: Ryan Madan, Charles Rich (CS), Mark Claypool (CS)

Enhancing Career Opportunities: Using Supervised Learning to Analyze Career Outcomes Data  
Robert Vigeant  
Advisor: Brenton Faber  
Sponsor: Dave Ortendahl, CDC

The Monomyth in Popular Science Writing  
Isabella Schiavone  
Advisors: Jennifer deWinter, Ralph Sutter (IMGD)

Dust-Covered Operations & Maintenance Manuals: Why O&M Manuals for Wastewater Treatment Facilities Rarely Meet Operators’ Needs  
Abbegail Nack  
Advisors: Ryan Madan, Stephen Kmiotek (CHE), Suzanne LePage (CEE),  
Sponsor: Woodlands Village at Hickory Hills Lake

Sepsis and Comorbidities in a Rural Area  
Meredith Rioux  
Advisor: Brenton Faber  
Sponsor: Canton-Potsdam Hospital, Potsdam, NY

Autism and Sensory Processing Disorder  
Matthew Moore  
Advisor: Brenton Faber
Robotics Engineering

Atwater Kent Labs, Room 116

9:00am
Robotic Automated Wingsail
Kelsey Regan, Dean Schifilliti, Daniel Singer
Advisor: Kenneth Stafford

9:15am
Dexter: A Smart Prosthetic Device for Transradial Amputees
Sienna Mayer, Gabrielle O’Dell, Yesugey Sipka
Advisors: Kristen Billiar (BME), William Michalson, Cagdas Onal

9:30am
Sailbot: Autonomous Robotic Sailboat
Nicholas Gigliotti, James Kuszmaul, Tucker Martin, Ryan Wall
Advisors: William Michalson, Kenneth Stafford

9:45am
Control of a Bipedal Robot
Georgios Ardamerinos, Ari Goodman, Sam Khalandovsky, Alex O’Brien, Logan Tutt
Advisors: Jie Fu, Kenneth Stafford

10:15am
5-Axis 3D Printing
Ethan Coeytaux, Cameron Crook, Alexandre Pauwels, Hugh Whelan
Advisors: Diran Apelian (ME), George Heineman (CS), Craig Putnam, Gabor Sarkozy (CS)

10:30am
Fire Containment Drone
William Boyd, Zachary Hood, John Lomi, Chase St. Laurent, Kyle Young
Advisor: William Michalson

10:45am
Low Cost Quadrupeds
Josh Graff, Alonso Martinez, Kevin Maynard, Alex Bittle
Advisor: William Michalson

11:00am
Landmine Detection Rover
Brendan Casey, Trevor Rocks
Advisor: Craig Putnam

11:15am
Blisk Inspection System
Breanne Happell, Karen Orton, Kevin Ouellette, Charles Sinkler
Advisors: Michael Gennert, Craig Putnam, Kenneth Stafford
Sponsor: GE Aviation

12:00pm
Swarm Robotics
Nathaniel Jefferson, Peter Raspe, Nam Tran-Ngoc
Advisor: Michael Ciaraldi (CS)

12:15pm
MRI Compatible Optical Force Sensor
Brian Hecker, James Maliff, Lumbini Parnas, Corin Rypkema
Advisors: Gregory Fischer, Cosme Furlong-Vazquez (ME)

1:15pm
The Autonomous Cargo Aircraft Project (ACAP)
Nicholas Cyganski, Benjamin Gillette, Killian Henson, Keshuai Xu
Advisors: Michael Ciaraldi (CS), Fred Looft (ECE)

1:30pm
AWeD: Automatic Weapon Detection
Skylar Alsever, Georgios Karapanagos, Carlos Monterrosa Diaz, Glen Mould, Paul Raynes
Advisors: Nicholas Bertozzi, Susan Jarvis (ECE)

1:45pm
EvoSim — Evolving Artificial Life Simulation
Yiğit Uyan
Advisor: Michael Ciaraldi (CS)

2:00pm
CARP - Custom Autonomous Robotic Painter
Odell Dotson, Katie Gandomi, Alora Hillman, Nicholas Panzarino
Advisors: Jie Fu, Michael Gennert, Kenneth Stafford

2:15pm
Cold Chain Device Viability for UAS Delivered Medical Supplies
Michael Beinor, Evan Bosia, Scott Cazier, Keegan Train
Advisors: Gregory Fischer, Jianyu Liang (ME)

2:45pm
Design and Development of a Myoelectric Transradial Prosthesis
Cameron Currie, Cameron Downey, David McDonald, Ashley Nistler, Gregory Port, Joseph Sabatino, Steven Souto
Advisors: Tiffiny Butler (BME), Sergey Makarov, David Planchard (ME), Craig Putnam (ECE)
3:00pm  
CHAMP: Tree Climbing Robot  
Devon Bray, Mead Landis, Rachael Putnam  
Advisors: Michael Gennert, Brad Miller, Kenneth Stafford

3:15pm  
Robodog: A Low-Cost Electrically Actuated Quadruped  
Yunda Li, Michael Pickett  
Advisors: Marko Popovic, Pradeep Radhakrishnan

3:30pm  
Markhor: Robotic Mining Platform  
Domenic Bozzuto, Rene Jacques, Aaron Jaeger, Brian Peterson, Yu-sen (Jason) Wu  
Advisors: Michael Ciaraldi (CS), Kenneth Stafford

3:45pm  
Dynamic Prosthetic Socket  
Michael Chan, Alexander Fitzgerald, James Honicker  
Advisors: Gregory Fischer, Christopher Nycz (grad student)

4:15pm  
Development of a Post-Fabrication Stiffness Characterization Tool for MEMS Devices  
Michael McConnell, John Williams, Shao Zhou  
Advisor: Cosme Furlong-Vazquez (ME)

4:30pm  
Plume Analysis and Detection  
Eric Fast, Stephen Harnais, Ryan Wiesenber  
Advisors: Raghvendra Cowlagi, Michael Demetriou (AE), Nikolaos Gatsonis (AE)

4:45pm  
Hospital Lobby Assistant  
Joseph Fainer, Tom Farro, Jacob Hackett, Erin Leger, Emily Yu  
Advisors: Gregory Fischer, Candace Sidner (CS)

5:00pm  
Accurate Prosthetic Hand  
Casey Kracinovich, Mervyn Larrier, Dylan Renshaw, Elina Saint-Elme  
Advisors: Marko Popovic

5:15pm  
Automated 3D Print Farm  
Alexander Ruggiero, Kevin Valente-Comas, Lauren Pontbriant, Dasan Costandi  
Advisor: Craig Putnam

Social Science and Policy Studies

Salisbury Laboratories, Room 305

9:00am  
Gender-Based Differences in Amyotrophic Lateral Sclerosis and Parkinson’s Disease Expression in C. Elegans  
Rebecca Burns, Aidan Burn (BBT), Marissa Patterson (BBT)  
Advisor: Jeanine Skorinko

9:30am  
Even Elementary Students Can Explore Algebra!: Testing the Feasibility of From Here to There!, a Game-Based Perceptual Learning Intervention  
Lindsay Braith  
Advisors: Erin Ottmar, Jeanine Skorinko

10:00am  
Dynamic Common Pool Resources  
Zach Chapman  
Advisors: Gbeton Somasse, Alex Smith
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Peter Sherlock, ’82, ’86 MS
Senior Vice President and Director of Bedford Operations
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Project work is one of the most distinctive aspects of a WPI education and has been at the core of WPI’s undergraduate curriculum for more than 45 years. It provides students the opportunity to gain professional skills, a talent for teamwork, and the confidence to dive right in. Together with our corporate partners, we are making progress one project at a time.

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- A project cannot be “mission critical” or on the “critical path.”
- The best types of projects support or enhance current activities.
- Most MQPs consist of a team of students (2-4) and a faculty advisor, although in some cases—depending upon the scope of the project and the disciplines of the student team—there may be additional advisors.

For more information about sponsoring a project, visit wpi.edu/+engage.

To contact a specific academic department, please refer to the list below. (Note: All numbers begin with 508-831-.)

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Biology and Biotechnology - 5543
Biomedical Engineering - 5447
Business - 5218
Chemical Engineering - 5250
Chemistry and Biochemistry - 5371
Civil and Environmental Engineering - 5294
Computer Science - 5357
Electrical and Computer Engineering - 5231
Environmental Engineering - 5330

Humans and Arts - 5246
Interactive Media and Game Development - 4977
Interdisciplinary and Global Studies - 6699
Mathematical Sciences - 5241
Mechanical Engineering - 5236
Physics - 5258
Professional Writing - 5198
Robotics Engineering - 6665
Social Science and Policy Studies - 5296
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