Kevin Boutsen

Curriculum Vitae – Past 6 years (2018-2024)
Assistant Teaching Professor and Undergraduate Program Director
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EDUCATION

- Ph.D. 2016, Mechanical Engineering, University of Miami
  Doctoral Thesis: Critical Flow Analysis and Understanding of Automotive Exhaust Ports
- M.S. 2013, Motorsport Engineering and Management, Cranfield University
- B.S. 2012, Mechanical Engineering, University of Miami

FULL-TIME ACADEMIC EXPERIENCE

Assistant Teaching Professor, Mechanical and Materials Engineering, Florida International University
December 2018 to present

- Teaching Professor in Senior Design, Thermodynamics, Internal Combustion Engines, Mechanical Design II and Transport Phenomena.
- Collaborated on the development of a new course structure for Senior Design with multiple faculty.
- As Undergraduate Program Director, worked on: 4-year graduation rate, reporting to ABET and SACS, teaching policy development, external funding opportunities, curriculum development and teaching assistant training.
- Interim Associate Chair – Fall 2024 onwards

OTHER PROFESSIONAL EXPERIENCE (PAST 6 YEARS)

Freelance Race Engineer, Boutsen Engineering (self-employed)
January 2018 – December 2018

- Race engineer for Boutsen Ginion Racing in WTCR (Honda Civic TCR) and GT Sports Club (M6 GT3).
- Race and performance engineer for FIST TEAM AAI in Blancpain GT Series Asia, China GT and Asian Le Mans Series on M6 GT3, Ferrari 488 GT3 and M4 GT4.
- Performance engineer for SCHNITZER Motorsport in ADAC GT Masters (Official BMW Racing Team) on BMW M6 GT3.

TEACHING EXPERIENCE

Co-Instructor – Ethics and Design Project Organization EML 4551, Florida International University
Co-Instructor – Senior Design Project EML 4905, Florida International University
2019-present

- Redesign of senior design course sequence and development of completely new course structure.
- Developed lectures / activities on ethics, implications of design work, breaking down the problem, communication.
- The sequence of courses is global learning certified.
- Led the organization of senior design showcase for the Mechanical and Materials Engineering department in person (2019, 2021, 2022) and online (2020, 2021)
- Advised and mentored multiple senior design projects. Responsibilities include guiding students in their design process, giving technical advice, giving teamwork advice.

Instructor – Thermodynamics EGN 3343, Florida International University
Spring 2019-present

- Developed course that was based on example-based learning and in-class group work on real world problems.
- Structured the course to have study problems assigned each week, with in-class quizzes, in-class group problem-solving
- Created an online version of the course for the Summer 2021 Semester collaborating with FIU Online

Instructor – Internal Combustion Engines EML 4421, Florida International University
Spring 2019-present

- Discussion based elective with push for interaction from students. Drove students to understand the decision making involved with designing and optimizing internal combustion engines.
- Teaching students PV diagrams in depth, design decisions and how to quantify engine performance related to general road vehicles.

Instructor – Mechanical Design II EML 4501, Florida International University
Fall 2019-present

- Students introduced to real world project-based learning. Students completed full gearbox projects for Honda JAS Motorsport (Fall 2019), BMW Motorsport (Fall 2020) and Lamborghini Squadra Corse (Fall 2021) by modifying gearboxes to increase performance.

Instructor – Transport Phenomena EML 3126, Florida International University
Summer 2020-present

- Fast paced 6-week course with example-based learning similar to the thermodynamics course.
- Focused on teaching an understanding of theoretical approaches through the history of fluid mechanics and essential derivations to understand different concepts.

- Completed the Online LIVE Instructor Certification and taught course in this modality (Summer 2021).

Instructor and development of FIU COIL Course in collaboration with Instituto Politécnico Nacional, Mexico

Introduction to Engineering EGS 1006, Florida International University

Summer 2022

- Development of an online course for FIU students and collaborating with IPN using FIU Collaborative Online International Learning.
- Working on common projects and interactions between students from different backgrounds
- Course focuses on building team skills, critical thinking, ethics in engineering, effective communication and an introduction to the engineering profession.
- This is in progress as of May 2022.

Instructor – Design of Thermal Fluid Systems EML 4706, Florida International University

Spring 2023-present

- Project based course and experimental based course.
- Economic Pipe Diameter Analysis coupled with Heat Exchanger Analysis

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TEACHING AWARDS

- Florida International University Excellence In Teaching Award 2022 - The Faculty Senate Honorary Degrees and Awards Committee selects a faculty member having established high records of achievement in Teaching. "*Each application will be evaluated on the following criteria: Quality of pedagogy, Evidence of learning and effective teaching, Professional development in higher education, Courses taught, Organization of application.*"

- College of Engineering and Computing Faculty Teaching Award 2021-2022. Every academic year, CEC's Faculty Council Awards Committee selects one faculty member for the faculty teaching award. The award is measured on the following criteria: "*Excellence in teaching may be demonstrated in as many ways as there are teachers. As such, it is an elusive attribute to define exactly and precisely. Nevertheless, excellence in teaching is evident in the ways that teachers direct, deliver, control, and react to the people, situations, and acquisition of knowledge within the confines of an actual or virtual classroom.*"
- Mechanical and Materials Engineering Department Teaching Excellence Award 2020-2021. Every two academic years, the Department of Mechanical and Materials Engineering's Awards Committee selects one faculty member for the Teaching Excellence Award. The award is measured on the following criteria: "*Excellence in teaching may be demonstrated in as many ways as there are teachers. As such, it is an elusive attribute to define exactly and precisely. Nevertheless, excellence in teaching is evident in the ways that teachers direct, deliver, control, and react to the people, situations, and acquisition of knowledge within the confines of an actual or virtual classroom.*"

STUDENT MENTORING

Throughout my time at FIU I have mentored a number of students through Independent Research and Senior Design Projects. A list of projects is shown below:

Independent Research Mentoring (most recent to least recent)

1. Roslan Cruz - Hydrogen Cell and Hydrogen Power in The Aerospace and Aviation Industry
2. Daniele Cattani - Aerodynamic Comparison of Two F1 Front Wing Models
3. Christian Cazzaniga - The Process of Transitioning from Design to Fabrication within Motorsport Applications
4. Abraham De Leon - Effects of targeted engine modifications on respective performance metrics
5. Raith Barahona - Effects of targeted engine modifications on respective performance metrics
6. Jared Whiteman - Design and Optimization of an FSAE Front Wing Using CFD
7. Aazim Sheikh - Autonomous Vehicles in Education
8. Amanda Perez - Oversteer and Understeer
9. Gabriel Aure - Oxygen Generator Research
10. Marvin Ortez - Heat Recovery in HVAC Equipment
11. David Ovalle - Analysis of suspension system used in FSAE's competition car
12. Erick Estruch - Analysis of suspension system used in FSAE's competition car
13. Mohamed El Idrissi Saad - Airflow Enhancement Through the Intake port of A Cylinder Head for an Internal Combustion Engine
14. Otniel Echagarruga Gayle - The Refrigeration Cycle as it applies to Air-Cooled Chillers
15. Lucas Etchart - Simulation of F1 Front Wing Nosecone Flow Analysis
16. Samuel Alvarez – Marine Exhaust Design
17. Elisa Bravo – Computational Flow Simulations of Microfluidic Devices with applications in Cell Culturing
18. Andy Garciga Serrat – Analysis and Interpretation of Race Car Data
19. Rafael Vargas - Investigation of automotive suspension systems, design practices for Formula SAE prototypes, and evaluation of FIU's PM19 suspension geometry and structure
20. Daniel Perez – Aerodynamics of a Formula 1 Front Wing
21. Samuel Alvarez – Internal Combustion Engine Research
22. Sheldon Cheng - CFD Analysis of a Front Mounted Wing
23. Alfredo Miranda – Lap Time Simulation
24. Nathaniel Garrido – Lap Time Simulation
25. Jimberlice Larochelle – A Review of Approaches to Increase Aerodynamics Operating Range
26. Julian Osorio – Body-Powered Devices vs. Myoelectric Devices
27. Ariana Perez – Understanding the Strategy Behind Formula 1 Pit Stops
28. Daniel Guerrero – Mechanical and Aerodynamic Study of the Behavior of An F1 Rear Wing
29. Erick Almeida – FSAE Intake Optimization through ANSYS Adjoint Solver
30. Brandon Garciga – Vehicle Dynamics Guide for Race Engineers

31. Alessandro Gianforcaro – Analyzing a Williams Formula 1 Front Wing with ANSYS Fluent
32. Eric Rodriguez – Vehicle Dynamics Guide for Race Engineers
33. Anthony Assue – Front Wing Formula 1 Aerodynamics Study
34. William Blanco – Variable Sweep Wing
35. Joan Garcia – Car Suspension Improvement
36. Gabriel Fernandez – Lap Time Simulator In Matlab
37. Lisdaimis Cabrera – Vehicle's Sound Quality and its Frequency

Senior Design Projects Mentoring (most recent to least recent)

2024- Cool2Heat: Improved Access to Hot Water
2024 - Hybrid ATV with Regenerative Braking
2024 - Team Neo: Improving the range of E-Bikes
2024 – Economic On-Microscope Incubator
2024 - The Warmth Wizards: Optimizing Hot Water Energy Usage for Homeowners
2023 – A.E.R.O F1: Optimization of Formula 1 Rear Wing
2023 - SulLi: Architecture Design of a Cathode for Lithium-Sulfur Battery
2023 - Optimization of Formula 1 Drag Reduction System Aerodynamics
2023 - Auto Chargers: Autonomous Charging Station
2023 - Clean Water Haiti: Renewable and Self-powered Water Treatment System for La Chapelle, Haiti
2023 - Team EVE: Panther X: Maximize Eco Vehicle Efficiency
2023 – Rerassor Robot
2022 – Wheel Cover Design for Road Bicycles
2022 – Passive Flow Splitting Module for Microfluidics
2022 – FSAE Exhaust Design
2022 – Fixed Wing UAV
2022 – Electrical Trolley 1
2022 – Electrical Trolley 2
2022 - Aeroelastic Design of Aircraft Wing
2022 - Contained indoor farming station
2022 - Development of a machine vision system for autonomous utility vehicle
2022 – FSAE Intake Design
2022 – FSAE Pedal Box Design
2022 - Maximize eco engineering vehicle efficiency
2022 - Modularized scalable renewable energy powered alluvial diamond/gold jigger
2022 - Race weekend decision support and engineering system
2021 - Reducing water pollution and improving direct access to clean water in under-developed countries
2021 - Additive Manufacturing of Simulated Lunar Regolith
2021 - Avalanche Safety Ski Jacket
2021 - Electric Cargo Wagon
2021 - Electric Turbo Conversion

2021 - Land Speed Record Motorcycle Aerodynamic Design
2021 - Manufacture And Testing Of A Complete Small Unmanned Fixed-wing Aerial Vehicle
2021 - Reusable “space-plane”
2021 – Add-on Car Floating Device
2021 – Cooling System for Pool in Florida
2021 – Design of a Cycling Helmet for Cooling, Aerodynamics and Comfort
2021 – Electric Jet Ski: Battery Safety, Housing Design, Integration of Electric Propulsion
2021 – Modelling/Simulation of Microfluidics Diffusion/Mixing
2021 – Supercritical Carbon Dioxide Rankine Cycles for Waste Heat Recovery
2021 – Vehicle Dynamics Model Applicable to Multiple Vehicles
2020 – Cable Robot for Warehouses
2020 – Active Lighting through Use of Roadside Wind Turbines
2020 – Automated Calibration Device and Method for 6DOF Force-Torque Sensor
2020 – Eco Engineering Vehicle Efficiency
2020 – Equivalent non-organic Material for Bird Strike in Aircraft
2020 – Hydroelectric Gutter System
2020 – Lambretta Gearbox Development
2020 – NFL Helmet Redesign
2020 – Optimization of Formula 1 Racing Rear Wing for DRS
2020 – Remote Control Fridge
2020 – Renewable Solar and Wind Propulsion System for Boats
2020 – Pyroshock Testing for Honeywell
2019 – Active Aerodynamics on a Race Car
2019 – Active Energy Generation from Aerodynamics
2019 – Design and Validation of FSAE Monocoque Chassis
2019 – Design of Formula 1 Rear View Mirror using Wind Tunnel Analysis
2019 – Development of a Vehicle Dynamics Model of a Race Car
2019 – High Performance Heat Sink by 3D printing
2019 – Thermal Management of Lithium Oxygen Batteries
2019 – Decision Support for Race Engineers
2019 – Motorcycle Helmet Aerodynamics
2019 – Roof Edge Spoiler
2019 – Solar Panel with Self Cleaning

DEVELOPMENT AND SERVICE

Fall 2023- Spring 2024: Preparation of 2024 Program Review

- Preparing Program Review evaluation on behalf of the Mechanical and Materials Engineering department.

Fall 2022-Fall 2024: Reorganization of Undergraduate Curriculum

- Aligning our program better with interdisciplinary approach and with ABET Outcomes.

Fall 2021- Fall 2022: ABET Report Writing and Visit Preparation

- Preparing ABET evaluation on behalf of the Mechanical and Materials Engineering department. ABET visit is completed in Fall 2022

Summer 2022: FIU Online Live Certified through the Center for the Advancement of Teaching

- Completed the first implementation of Online Live at FIU and implemented this modality in Transport Phenomena course (EML 3126)
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Spring 2021 - present: ABET Evaluator Training

- Currently training to become an ABET Program Evaluator

Fall 2019 - present: Undergraduate Program Co-Director

- Focus on 4-year graduation rate by redesigning curriculum and streamlining students through 8 semesters. Student tracking has been enhanced and is increasing graduation rate every year. Student tracking is done using advanced analytics
- ABET reporting and SACS reporting
- Working on teaching policy and teaching assistant training
- Apply for external funding opportunities for undergraduate program to support Senior Design and other courses. Received funding from different entities such as the Thornton Tomasetti Foundation.
- Helped in the process of getting new partners of the program and the college such as Siemens.
- Improving student access to internships and undergraduate research opportunities

Fall 2019: Consulted with Honda Racing for the World Touring Car Cup

Fall 2019-present: FIU Formula SAE Advisory Committee Member

College and Department Level Committees:

- 2020 - 2024: Member of the Mechanical and Materials Engineering ABET Committee
- 2020 - 2024: Member and Chair of the Mechanical and Materials Engineering Curriculum Committee
- 2019 - 2020: Member of College of Engineering and Computing CEC Scholarship Committee

OTHER SKILLS

Languages: Fluent in English, French, Spanish and Italian
Engineering Software: ANSYS FLUENT, ICEM CFD, SOLIDWORKS, LS-DYNA, ABAQUS, MATLAB, GNU PLOT, AVL BOOST, GT-POWER, RICARDO WAVE.
Race Engineering: Excel VBA, MOTEC i2, Bosch, WinTax, 2d Data, Pi.
Machine Shop Experience, Additive Manufacturing Experience and Manufacturing of Metal Parts.

INTERESTS

Avid cyclist; traveling and exploring different cultures; working on cars and motorbikes