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### According to Brandon Faulkner
### Holland & Knight, Partner

*"The icIMSE affords businesses a unique opportunity to partner with those in academia to achieve business goals and objectives. The Consortium serves as a mutually beneficial relationship for everyone involved. Partners of the Consortium collaborate with faculty and students to solve real world problems, which benefits the students' learning from applying engineering principles in the field. The Partners also benefit by fostering lasting relationships with faculty who are thought leaders in their fields, and gaining insights into how other Partners are solving their challenges. This is a fantastic program offered by the USF IMSE department."*

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# UNIVERSITY of SOUTH FLORIDA

## We invite you to become a partner in the

## Industry Consortium for Industrial and Management Systems Engineering

# icIMSE



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## The Consortium (icIMSE):

Each year, industry partners submit project ideas to the IMSE department. Projects are selected jointly by faculty and industry partners. Project teams (often a mix of bachelor and master's degree seeking students) are selected to engage on chosen projects, usually one per partner per year. Students apply their knowledge of data analytics, AI, machine learning, advanced lean six sigma, design of experiments, simulation, systems optimization, manufacturing processes, quality control analytics, human machine systems, among others.

> The consortium provides partner companies with a significant added avenue for networking with USF and gaining access to its resources.

> Projects offer opportunities for the partner companies and the IMSE students to build professional relationships and awareness.

> Partner companies are provided access to the pool of resumes of the participating students for hiring as co-ops, interns, and full time positions.

> Partner companies are invited to an annual conference of the consortium each spring where the project results are presented by the teams, followed by lunch, a keynote speech and open dialogue among consortium partners, students, and faculty.

## icIMSE Mission and Guidelines:

The mission of the icIMSE is to invigorate networking and experiential learning opportunities for industrial engineering students via interactions with industry in all sectors of the economy, especially those with significant presence in the Tampa Bay area and the Southeastern U.S.

> Partner companies are asked to make a tax-deductible donation of $5,000 per year to the consortium (USF Foundation). The funds are used to support and maintain a superior experiential learning environment. This helps students to grow as professionals and build close ties with partner companies.

> Partners are informed prior to every academic year of the classes offered and project submission timelines. IMSE faculty members lend their expertise to help partner companies select projects and define appropriate scope and timeline, as needed, before submitting them for consideration.

> One project per academic year from each partner is considered. Projects are generally scoped for one semester in duration (August - December, January - May).

> Project cycles are synchronized with the academic year of August through May. However, a partnership year may Be aligned with the fiscal year of the Partner companies/organizations.

## About Industrial and Management Systems Engineering

Industrial engineers and engineering management Professionals strive to find innovative ways to improve the design and function of products, processes, and integrated systems.IEs differ from other engineering disciplines by their systems view of the world, as well as their broad understanding of the business impact of engineering decisions. They draw upon knowledge of not only the mathematical, statistical, and physical sciences, but also of the social sciences, and management in particular. One of the strengths of IEs is that their skills are in demand in all sectors of the economy including financial services, communications, defense, healthcare, entertainment, and manufacturing. Thus, our programs attract students with diverse backgrounds and with broad career goals. Our department hosts over 150 undergraduates, 200 masters and 25 full-time PhD students, and maintains a vibrant and collaborative learning environment.

## IMSE Areas of Expertise:

- Data Analytics and Decision Making
- AI and Machine Learning
- Systems Optimization
- Supply Chain and Risk Analysis
- Health Systems Analytics
- Product and Process Flow Analysis
- Manufacturing Planning
- Human Machine Systems

- Simulation Modeling
- Financial systems
- Quality and Reliability Improvements
- Product and Systems Design
- Lean Six Sigma
- Cost Analysis
- Transportation Modeling
- Scheduling and Logistics

## Sample projects completed by IMSE student teams:

### Proxy Position Check - Corporate Actions

Project type: Machine learning and robotics

Industry: Financial services

**RAYMOND JAMES**

### Machine Learning-Enabled Quality Review of Audit Control Descriptions

**MetLife**

Project type: Data analytics
Industry: Insurance

### Call-Bed Project to Reduce Unsatisfied Customers after Exit Survey

**FLORIDA HOSPITAL**

Project type: Data Analytics and Human Systems

Industry: Healthcare

### Challenged Material Future State Vision

**Raytheon Intelligence & Space**

Project type: Lean Six sigma
Industry: Defense manufacturing

**TECO ENERGY AN EMERA COMPANY**

### Battery Storage System Operation Optimization

Project type: Data analytics and optimization

Industry: Power Utility

**DUKE ENERGY®**

### Power Augmentation Planning

Project type: Process optimization

Industry: Power Utility

## Recent icIMSE Project Highlights

- **Raymond James** engaged a student team to create a robotic process automation bot that identifies the position of shares and reports any discrepancies found. The robotic process automation (RPA) bot utilizes an Excel file containing a list of depositories and stake holding details. This information when fed to the bot together with the data obtained from DTCC and Broadridge, and Fidelity website, helps in identifying the position of shares and related discrepancies (if any).

- IMSE students worked with the production supervisors at **Duke Energy** to engage in a study of what combination of augmentation methods will provide the maximum increase in MW generation at a minimum cost. The methods considered were changing intake air temperature to turbines, duct burning, and evaporator systems. The analyzed production data from various conditions to arrive at their conclusions and recommendations.

- **Raytheon Intelligence & Space** engaged a student team to develop a strategic plan to better manage challenged material—material that is damaged mechanically or electrically or is otherwise suspected to have a defect that results in its removal from production flow pending inspection. Unacknowledged challenged material was recognized to be a source of economic loss within the manufacturing facility and a plant-level holistic plan was developed to minimize this economic loss.

- A team of students at **MetLife** used machine learning and text mining techniques, integrated with domain knowledge of auditors, to enhance the automatic quality review of control descriptions for MetLife Internal Auditing group. A real case study in partnership with MetLife Company was used to implement the tools developed by the project and demonstrate their benefits.

- **TECO Energy** engaged a student group to develop an efficient strategy to charge and discharge the newly installed battery energy storage system (BESS) to address multiple objectives: maximize arbitrage potential, offer support for smoothing variabilities in PV generation, while also ensuring maximizing battery life. A data driven optimization model was developed to address the above objectives for different generation demand and pricing scenarios.

- The student team at **Florida Hospital** analyzed the response time data for calls received by the nurse's station from patient beds. The objective was to determine the causes of response time variations and develop possible solutions as the Medicaid payment received by the hospital depends on the patient satisfaction and quality of care.