

Physics Department ABET Accreditation Process Update

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Our Journey Toward Accreditation is in Full Swing

Our journey toward achieving an ABET Accredited Engineering Physics (EP) BS Degree at JCU began back in 2018 with an Academic Program Review of the Physics Department. In simple terms this was the genesis of the strategy to build an accredited engineering program within the Physics Department. In 2019, the First Alumni Planning meeting took place which led to a Department Proposal for the ABET Program. Shortly thereafter in 2020 the ABET Proposal was included in JCU's new "University Strategic Plan". From there it was off to the races as we began to bring all the pieces of this puzzle together.

Today we are well into the development of the ABET Accreditation Program and this newsletter is intended to bring our alumni and program benefactors up to date on our progress as well as our needs for assistance. The key deliverables of this program are as follows:

- Obtain ABET accreditation by summer 2026
- At least double enrollment, and increase retention & graduation numbers
- 1+ internship experiences for every Engineering Physics student
- 100% placement rate

The rest of this newsletter will provide a progress report in the following areas:

- ❖ **Curriculum and Staffing**
- ❖ **New Capital Equipment & Engineering Infrastructure**
- ❖ **Student Centered Goals & Deliverables**
- ❖ **Fund Raising Goals & Achievements**

The whole Physics Department Staff and our Alumni Working Group appreciate your help thus far and look forward to your continued interest and support!

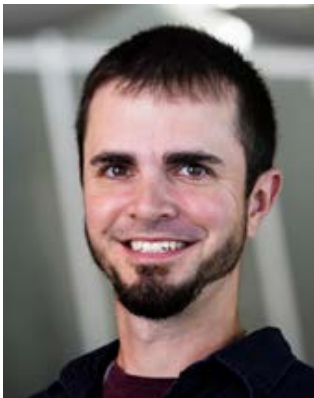
Naveed & Jeff

ENGINEERING AT JCU
THE NEXT BOLD LEAP - Putting the "E" in our
STEM program while leveraging the integrity
and values of a JCU Liberal Arts education.

**INSPIRED
FUTURES**

Curriculum and Staffing

One of our first steps in this journey was to bring on Professors who were experienced in the development and implementation of the curriculum necessary to fulfill the Engineering Degree requirements. We are pleased to introduce Cory Gloeckner PhD, who joined the department in 2022 and Ben Grossman-Ponemon PhD who joined in 2023.



Cory Gloeckner



Ben Grossman-Ponemon

Dr. Cory Gloeckner is an Assistant Professor of Engineering Physics at JCU and comes to us with a B.S. Chemical Engineering from the University of Cincinnati and a PhD in Biomedical Engineering from the University of Minnesota. Dr. Ben Grossman-Ponemon is also an Assistant Professor of Engineering Physics at JCU and comes to us with a B.S. in Aerospace Engineering from Worcester Polytechnic Institute and a PhD. In Mechanical Engineering from Stanford University.

Cory and Ben are jointly working on several new course offerings and have led the way for a revised curriculum to meet the ABET Standards. These revisions include the following:

- ✓ EP1510/21– Intro to Engineering / Engineering Physics Projects (first year; fall/spring)
- ✓ EP2540 – Computation in Physics & Engineering (2nd year)
- ✓ EP3510 – Statics & Dynamics (3rd year)
- ✓ EP4511/21- Senior Engineering Design I / II (4th year; fall/spring)

Capital Equipment & Infrastructure

To make this program happen, we need to upgrade our equipment and add more space. The University has recently announced that the Physics Department will receive an **additional 1,300 Sq. Ft. of space** in the Dolan Center for the expansion of the Engineering Physics program. This new space will help support new research and teaching endeavors.

Here is a quick update on our other Capital and infrastructure Projects:

Upgrade Electronics Laboratory Instrumentation: We are at 50% of the goal for this project and need to add and upgrade more workstations with the latest electronic test and measurement equipment.



Maker-space for Prototyping and Idea Development: Our initial investments, 25% toward our goals, consist primarily of a couple of PLA-based 3D printers. Ultimately, we plan to include additional 3D printers, a laser cutter/engraver, hardware to support printed circuit board development and characterization, and more. We will create an environment that invites creativity, idea-development, prototyping, and project development.

Modernize Machine Shop: As we move toward the future new CNC machines with larger capacity are needed as well as other upgraded metal cutting tools such as a band saw and drill press.



New Engineering Laboratory Equipment: With the addition of core engineering principles to the curriculum, we aim to couple new courses with engineering lab equipment to effectively demonstrate the theories we are teaching. Picture a Gas Turbine Engine Lab to demonstrate thermodynamics and calibration, a fluid mechanics suite, a materials testing station, and an Industrial Robotic Arm for real-world experience in automation. All of these developing ideas will need funding support from our Alumni Group.

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Student Centered Goals & Deliverables

Our number one goal and key deliverable of the ABET Accreditation Program is to grow enrollment. Not only for we want to add students seeking an Engineering Degree, we also want to make the JCU Physics Department a more attractive alternative to prospective students. We believe we have a very attractive offering by leveraging the Jesuit, liberal-arts education to help students learn to serve society in ethical and socially conscious ways, to be adaptable, and lead with character in their profession.

Using the 5 year average (2016-2021) as our baseline, we had a total of 25 Physics Department Majors. In 2022 we added 9 new students for a total of 34 and in 2023 we added another 15 students for a total of 49. The addition of 24 new students in the past two (2) years represents 170% of our goal of 14 students. This is a very good start. When it comes to EP student enrollment the numbers are equally as good with 8 new students vs a goal of 7 or 114% of our target.

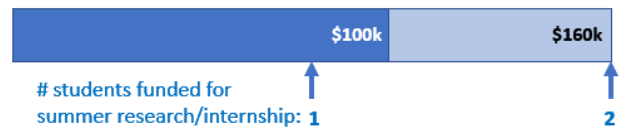
		22-23	23-24	24-25	25-26
<i>Additional</i> new 1 st year students in program relative to 5-yr avg.	Goal	2	5	9	14
	Actual	1	7		
Total number of physics department majors	Goal	32	39	46	60
	Actual	34	49		

Last year we launched a student/alum Mentoring process, in which 19 students and 9 alumni have participated over the past 2 years. This effort consisted of multiple Zoom meet-ups for professional development and career advice. Additionally, alum Nick Bjelac facilitated a site visit to Cleveland-area manufacturing facility at Swagelok in which 13 students participated. Thanks, Nick!

Recent full-time summer internships for students included NASA in Cleveland, the Southwest Research Institute in Texas, and on-campus faculty research labs. Other industry exposure has come through senior projects with Martian Sky Industries (local startup company) and National Polymer. Finally, the department has begun a formal partnership with a local space communications company, Comsat Architects, that promises to lead to internships, senior projects, and future employment of JCU grads.

Fund Raising Goals & Achievements

Alumni support is welcome and necessary. Whether it is through scholarships, general department support, or a leadership gift to supply a major piece of equipment, your generosity will impact the entirety of this flourishing program. For example, the Keresman '82 Physics Internship Endowed Fund is currently able to sustain only one (1) on-campus internship per year. Our goal is to be able to support two (2) per year which will require an additional \$60,000.



Outside of that, we have raised \$45K against a goal of \$350K for EP capital equipment. Below are the most pressing needs:

Electronics Lab Upgrade Funding

1. Oscilloscopes and signal generators
2. Soldering stations
3. Miscellaneous parts and supplies.

Maker Space Funding

1. Stereolithographic (resin) 3D printers
2. Laser cutter/engraver
3. Printed circuit board (PCB) milling system for fabrication

Machine Shop Upgrade Funding

1. CNC mill and lathe
2. CNC router
3. Band saw and drill press

New Curriculum Based Lab Equipment Funding

1. Jet Engine Laboratory
2. Industrial robotic arm
3. Universal materials testing apparatus



Help us continue to build this enriching and competitive Engineering Physics program at JCU!

Contact Drew O'Kane, University Advancement, with questions about making your gift!