

# ENGINEERING SKILLS INITIATIVES

We invited delegates to share with us examples of good practise in university/industry interaction designed to develop skills among engineering graduates. An impressive range and variety of work has been shared and all examples are included on the following pages (in alphabetical order of organisation).

**AIRBUS**

Shared by [Rachel Schroeder](#)

**AIRBUS**

### **Airbus Global University Partner Programme (AGUPP)**

The Airbus Global University Partner Programme is a strategic initiative launched to foster long-term collaboration with selected universities and engineering schools world-wide, in areas of mutual interest. This includes the development of strategic competences, both technical and soft skills, the development of training courses and support to universities to encourage diversity among engineering students and graduates. The programme began as the Airbus University Board and was expanded Group-wide in 2014. It covers 21 universities in 11 countries to date, each university supported by a dedicated focal point and ambassadors, mainly from Engineering and Employment Marketing. We look to expand to 5 more in 2017. Names have not been announced yet while we continue our discussion with these new universities.

Bi-lateral activities identified and implemented with all partner universities over the past 2-3 years, including 3-way university collaborative working for students, all-university partner Innovation week (Airnovation Summer Academy); set-up and running of Group-wide University Ambassador program (to support universities); creation of on-line collaborative, a platform for exchange between Airbus and universities as well as among the universities; and production of annual report to document and communicate about actions and progress.

With each of our partner universities there are a number of concrete actions with respective impact – too numerous to mention above but we can provide more detail if attendees are interested.

[company.airbus.com/careers/commitment-to-education.html](http://company.airbus.com/careers/commitment-to-education.html)

### **Airbus Fly Your Ideas**

Airbus Fly Your Ideas is a global competition, which challenges students worldwide to innovate for the future of aviation. Launched in 2008, the aim is to engage with universities and students worldwide and from all backgrounds. The challenge received UNESCO patronage in 2012 with a renewed partnership in 2014 and 2016. The key goals are to stimulate innovative ideas for a more sustainable aviation industry and to identify opportunities for R&T development and interaction with academic research teams.

Fly Your Ideas is a unique opportunity for students to innovate, be creative and develop their skills with a leading global company on real-life industry challenges. By investing in global talent Airbus will be able to continue to meet the challenges facing the aviation industry.

Since the competition was launched, over 20,000 students have registered to participate, from over 650 universities and 100 countries worldwide, with over 400 Airbus employees supporting the students and assessing entries.

For the 2017 edition, 5499 students registered for the competition with 356 teams submitting an idea. 5 finalist teams were invited to Airbus HQ in Toulouse to prototype, visualise or test their ideas in Airbus' inhouse innovation facility, ProtoSpace. The finalists presented their ideas to a distinguished international jury panel of Airbus and industry experts before selecting the winning teams.

[www.airbus-fyi.com/](http://www.airbus-fyi.com/)

[www.facebook.com/AirbusFlyYourIdeas/](https://www.facebook.com/AirbusFlyYourIdeas/)

## AMBROSE ALLI UNIVERSITY

Shared by [Prof. Adagbonyin Obiazi](#)



### Solar Power System for Uninterrupted Energy

Final year students divided into groups and assigned different aspects of the Solar Power Project. From design to final installation, tests and commissioning.

Nigeria has serious power supply deficits. Students gained important knowledge and practical skills on types, grades and capacities of solar panels, solar insolation levels of given geographical location, sizing of batteries, inverter capacities and design, charge controllers and protective systems, cable sizing and load sizing. Thus, preparing them to become entrepreneurs in renewable power supplies.

[www.lmu.edu.ng](http://www.lmu.edu.ng)

## AMERICAN UNIVERSITY IN DUBAI

Shared by [Dr. Alaa Ashmawy](#)



### Field Experience

This course is a combination of lectures and field work to prepare junior students for careers in engineering. The course is required as part of the curricula at AUD.

Paper: Field Experience in Undergraduate Engineering Curricula – An Alternative Approach. To be published at WEEF 2017.

### Software Across the Curriculum

This initiative focuses on ensuring student proficiency in industry-current software tools by integrating them within the various courses. Employers refer to this skill as a critical component of student employability. AUD graduates are ranked among the top 150 universities in the world in terms of job readiness.

# INITIATIVES



## AMERICAN UNIVERSITY OF SHARJAH

Shared by [Dr. Richard Schoephoerster](#)

### UTEP-Lockheed Partnership for Practice-Based Education

The UTEP-Lockheed partnership is based on a medical school model of engineering education that encompasses laboratory experiences, internships, and collaborative research. The medical school model for engineering education provides an optimal means to prepare engineering students for professional practice.

Modeled after:

<https://16mhp3atvadnrip2kwi9or-wpengine.netdna-ssl.com/wp-content/uploads/2016/12/ChangingWorld.pdf>

### Internship-Senior Design Cooperative Experience Program at AUS

The program is still in its first year of implementation.

## AUTODESK

Shared by [Matthew Bell](#)



### Autodesk Education Community

Autodesk provides free access to a wide portfolio of products for all Education Institutions, teachers and students around the globe to help support the next generation of industry leaders. This has removed financial barriers for students around the world by granting access to the latest in industry standard software.

[www.autodesk.com/education](http://www.autodesk.com/education)

## CHITKARA UNIVERSITY

Shared by [Dr. Rajnish Sharma](#)



### nVidia CUDA Laboratory

nVidia Technologies established a laboratory at Chitkara University campus in 2010 to help train young graduates on CUDA technologies. Owing to extreme dedication and hard work, same was updated to a regular CUDA teaching Center within 3 years if time. At least 4 research scholars completed their PhDs in the area of Parallel programming and they used CUDA as an important tool for the same.

[developer.nvidia.com/centers-listing](http://developer.nvidia.com/centers-listing)

[www.chitkara.edu.in/engineering/industrypartnerships](http://www.chitkara.edu.in/engineering/industrypartnerships)

### Strong Association with nXP Semiconductors

NXP semiconductors lab has been established by a 4 billion dollar multinational company with its presence in 25 different countries of the world. NXP Semiconductors provides High Performance Mixed Signal and Standard Product solutions that leverage its leading RF, Analog, Power Management, Interface, Security and Digital Processing expertise. As a part of this laboratory, Chitkara University has been granted state of the art software as well as hardware for realizing various electronic circuit design applications.

nXP Semiconductor takes initiative in training young graduates on Layout Design Techniques for state of the art electronic circuits. Every year at least 3 to 4 students are first inducted as Trainees and later are offered full time role in the organization.

[www.chitkara.edu.in/engineering/industrypartnerships](http://www.chitkara.edu.in/engineering/industrypartnerships)

## COMMON PURPOSE

Shared by [Louise Andersson](#)



### Common Purpose Global Leader Experiences & Study Abroad

Common Purpose is a not-for-profit organization founded in 1989 that develops leaders who can cross boundaries. This enables them to solve complex problems both in organizations and in cities. Our student programmes aim to create the next generation of global leaders who can work across boundaries to tackle the major problems of the world. During the Global Leader Experiences and Study Abroad programmes, students from diverse backgrounds work together over four days to tackle real global challenges and develop their Cultural Intelligence. These programmes are run in over 70 cities across the globe.

94% of students say our programmes have helped them develop as leaders. 96% of students say our programmes have helped them gain broader networks. 95% of students say our programmes have helped them make better decisions. 95% of students say our programmes have enabled them to drive bold innovation.

[commonpurpose.org/impact/the-impact-of-our-programmes/](http://commonpurpose.org/impact/the-impact-of-our-programmes/)

[commonpurpose.org/leadership/programmes/students/](http://commonpurpose.org/leadership/programmes/students/)

## DELFT UNIVERSITY OF TECHNOLOGY

Shared by [Prof. Dr. Henri Gerard Cato Werij](#)



### Design / Synthesis Exercise in BSc Programme

The Design / Synthesis Exercise is the final assignment that concludes the BSc Aerospace Engineering at TU Delft. In groups of 10 during 10 intensive, pressure-cooker weeks, the students work on an aerospace design often commissioned by the industry. During a final symposium the students present their designs to an international jury of experts from academia and industry. They specifically need to convince the jury that they were able to make an excellent aerospace design by working together successfully in a multidisciplinary and intercultural team. One of the teams wins the competition. All successful students are granted their BSc degree. The Design / Synthesis exercise does more than just forge ties between students and industry. It also leads to successful designs and spin-off companies. ATMOS UAV for example recently launched an innovative mapping and surveying drone based on a DSE design.

### Compulsory 3-month Internship in the MSc Programme

All students in the MSc programme Aerospace Engineering at TU Delft do a compulsory internship of at least 3 months in a company, university or research centre. Since 1999 they have completed projects in more than 640 organisations in all corners of the world. The internship gives students skills that complement those taught at university. At the same time the faculty receives continuous feedback on the performance of our students with respect to the end-competences required for a Master degree. The companies benefit from the students' fresh view and analytic approach. Leon D Poon, at the time Principal Analyst Aircraft Development at Qantas Airways Ltd: "Delft students have proven themselves to be extremely analytical, highly intelligent, professional and effective problem solvers. They have, and continue to demonstrate the value they add to the Qantas Group business whilst also gaining invaluable industry experience from one of the world's most experienced and reputable airlines... We look forward to receiving more talented students and the strengths they bring to our business for many more years to come."

### Member of the Airbus Global University Partner Programme

In order to stimulate internships, collaborative research, graduate employment of our students at Airbus and discuss the skill sets of the 'Engineer of the Future', the faculty of Aerospace Engineering is a partner of the Airbus Global University Partner Programme. In 2016 the faculty hosted and co-organised the first Airbus Airnovation Summer Academy

### The Mentor Alumni Programme

The faculty of Aerospace Engineering Mentor Alumni Programme (MAP) helps aerospace engineering students to prepare for their future careers in industry by linking them to alumni mentors. The pilot of the programme started in October 2016 with 100 students and 86 alumni and has already proven to be very successful. Based on their own experience alumni can advise students and share thoughts about studies and future career paths. For alumni this is an opportunity to give something back to their former faculty, to strengthen their coaching and advisory skills and to help them stay in touch with new generations of engineers. With the programme the faculty facilitates the construction of a sustainable network for students and alumni. Furthermore, MAP helps the faculty to strengthen existing and invest in new relations with alumni from all over the world. This offers new opportunities for collaborations in fields of education and research. The second cycle started in March 2017 with 132 students and 86 alumni.

### Warm Connections to the Industry

The faculty of Aerospace Engineering is an active member of networks, in Europe and worldwide, and an initiator of connections on many levels with stakeholder groups to ensure we are in line with the developments in and needs of the industry. Three specific examples are:

**The Faculty Advisory Council:** the 25 council members, leaders from the Dutch aerospace industry, knowledge institutes and governments, are consulted regularly on issues such as the integration of international students, innovation in the BSc and MSc curricula and knowledge transfer.

**PEGASUS:** The faculty is currently Chair of the PEGASUS network, a network of the 26 best aerospace universities/faculties in Europe. Activities include the development of a domain specific quality assurance system (PERSEUS) for aerospace education programmes. And the PEGASUS-Industry Alliance (with Airbus, UTC and Thales Alenia Space) focussing on cooperation between universities and the industry in curriculum development and research.

**CDIO:** The Faculty of Aerospace Engineering collaborates within the CDIO initiative (<https://en.wikipedia.org/wiki/CDIO>).

## EMBRY-RIDDLE AERONAUTICAL UNIVERSITY

Shared by [Dr. Maj Dean Mirmirani](#)



### Dassault Design Institute (DDI)

DDI is a collaborative initiative between Embry-Riddle Aeronautical University and Dassault Aviation and Falcon Jet since 2010. It includes a series of projects undertaken by 3-5 engineering students, Bachelors and Masters, focused on the redesign of a Dassault legacy aircraft, Falcon 10, of which about 100 are still in service, to improve efficiency and performance. Students were under the supervision of an Aerospace Engineering faculty and an executive committee including the Dean of Engineering, the Falcon Jet Marketing Director (an alumnus), the Senior VP and O Director of Engineering of Dassault Aviation.

Falcon 10 aircraft Engineering Data was made available to ERAU students on a secure server. Projects were carefully selected to have real-world value and so that modification recommended be potentially adopted by current owners. Sample projects include: More Electric Airplane; Design of winglets, structural analyses, prototyping, type certification; Development of "Flight Print" index to quantify aircraft performance, a quantitative method for performance comparison.

15 students have gone through the Institute and all have had multiple offers upon graduation as the result of the experience. The project has helped to forge strong partnership between the University, Dassault, and Falcon Jet.

## IBM

Shared by [Dr. Diem Ho](#)



### IBM Academic Initiative

Helps educators (primary, secondary and higher learning schools, and research professionals at accredited institutions) worldwide to teach students market-ready skills and leverage our resources with:

- Free-of-charge or discounted access to IBM software, courseware, hardware, and technology resources available
- Skill-building opportunities ranging from IBM and ecosystem events to student competitions

Since inception in 2004, over 31,000 faculty members across 6,000+ institutions have participated in the Academic Initiative, teaching courses to 3M+ students.

[developer.ibm.com/academic/](https://developer.ibm.com/academic/)  
[onthehub.com/ibm/](https://onthehub.com/ibm/)



## On Demand Community

Largest corporate volunteer initiative in existence, providing employees and retirees access to more than 200 tools utilizing IBM technology, resources, and training designed for volunteer efforts in public education and not-for-profit organizations.

- 280K Registered active and retired IBMers
- ~20M Hours of skills-based volunteer service contributed
- \$470M+ Market value of skills-based contributions since program inception

We also foster collaborative research with universities related to transformation and innovation of businesses and governments, and address global grand challenge problems through fellowships, grants, and funding for programs of shared interest. IBM contributions to education in 2015 was \$154.8M.

[www.research.ibm.com/university/index.shtml](http://www.research.ibm.com/university/index.shtml)

## IOWA STATE UNIVERSITY

Shared by [Prof. Sarah Ann Rajala](#)

IOWA STATE  
UNIVERSITY

### Boeing/ISU/NCA&T Senior Design Project

This project brings together students from two universities (1000 miles apart) in a yearlong capstone design project. The 2016-17 project required students to design, build and test an autonomous aircraft for the year 2040 that will take off and land vertically, and that can deliver water, and hotshot crews in order to fight wildfires. Two teams of students (aerospace engineers from ISU and mechanical engineers from NCA&T) learn to collaborate, communicate, overcome challenges and present preliminary designs and results to technical experts from Boeing. A winning design is selected at the end of the year. The project is in its 5th year.

[news.engineering.iastate.edu/2017/04/14/senior-design-teams-present-their-projects-to-boeing/](http://news.engineering.iastate.edu/2017/04/14/senior-design-teams-present-their-projects-to-boeing/)  
[news.engineering.iastate.edu/2016/04/22/aer-e-seniors-present-capstone-projects-to-boeing-engineers/](http://news.engineering.iastate.edu/2016/04/22/aer-e-seniors-present-capstone-projects-to-boeing-engineers/)



## ISHIK UNIVERSITY

Shared by [Prof. Dr. Ahmet Oztas](#)

### Adopting “Smart” Technologies for Society-involvement in Having Safer City Roads

The involvement of students in higher education should target project ideas that promote the standards of life in an implementable cost-effective way. Using a special App, the smartphone is placed on the car’s dashboard to collect vibration data while driving.

The system is smart and can distinguish between vibrations resulting from driving over such road disorders and those that are resultant of driving maneuvers.

The system uses Artificial Neural Networks to “Learn” how to distinguish between “normal” and “disorder” waves.

## MCMASTER UNIVERSITY

Shared by [Dr. Ishwar Puri](#)



### McMaster Engineering Experiential Learning Ecosystem

The McMaster Engineering Experiential Learning Ecosystem enables and encourages students to:

- Take ownership of their learning and learning objectives: students can identify topics they want to explore and skills they want to develop, and identify a personal “learning plan” to achieve these objectives. This “learning plan” may include a combination of learning which takes place both inside and outside of the classroom.
- Participate in a range of activities which break down the siloes between engineering disciplines, and which cross disciplinary boundaries to expose students to diverse intellectual approaches and traditions.
- Engage in learning activities with a wide range of people and groups, developing empathy and appreciation for diversity including diversity of gender, age, culture, ethnicity, as well as diversity of thought and opinion.
- Participate in different activities as learning goals change and develop: students’ learning and skill development goals change over time; having a broad range of activities to choose from enables students to align activities with changing learning goals.
- Seek experiences which suit the individual: for example, both introverts and extroverts will find congenial ways to participate, and ways to succeed.

## NATIONAL SCIENCE FOUNDATION

Shared by [Dr. Vilas Sitaram Mujumdar](#)



### Pacific Earthquake Engineering Research Center, UC Berkeley

The initiative at this center developed the concept of performance-based earthquake engineering rather than a prescriptive approach that was adopted in the design codes. Students at four universities that were part of the center were taught this approach and are employed as practitioners in the industry.

### MCEER – State University of New York, Buffalo, NY

Development of a holistic resilience approach to natural hazards that incorporated engineering and socio-economic disciplines to benefit the society as a whole. This concept of holistic resilience has been now well adopted in the US and internationally. Further quantitative work is being carried out by many researchers and practitioners.

## SCHLUMBERGER

Shared by [Dr. Mostefa Laroussi](#)



### Continuous Improvement

The C.I. is based on the LEAN methodology or six sigma and can be implemented in any subject matter. On teaching and dispensing knowledge which is our core business at the European Learning Center it changed our way of teaching by moving from pushing the information to pulling the information. Engagement and class interactivity are the vehicle of any content delivery.

The direct impact of C.I. is a total transformation of our curriculum programs with a distribution between the practical and theory of 70% / 30%. In addition, a new design of our workshops where all waste was eliminated under the slogan 'do not look for the tool, the tool is waiting for you!' As well as 'do not look for the document just plug and play it'.

## SEOUL NATIONAL UNIVERSITY

Shared by [Prof. Dr. Kunwoo Lee](#)



SEOUL  
NATIONAL  
UNIVERSITY

### Graduate School of Engineering Practice

2-year Master's Degree program for engineers from all over the industry. Engineers bring their own engineering project to begin the program.

The objective is to: enhance engineering problem-solving capabilities; strengthen engineering fundamentals; convey individual projects; add up strategic views on new industries and technologies; and learn from other disciplines. Team activities are encouraged.

### SNU Engineering Consulting Center

The Center supports: 1) Technology Consulting, 2) Technology Commercialization, and 3) Technology Education and Appraisal through the entire Engineering Department. A network for collaboration is set up with 50 domestic affiliates.

## SEPTODONT

Shared by [Deane Pittman](#)



### Extended COOP / Intern Placements

The 4-month COOP / Intern term has always been a challenge for Industry and Students. The term is so short that the high value learning period is often restricted to a month or two.

With a term of 12/16 months, the student receives much more in-depth & valuable training. Lessons learned in the first few months can be reapplied (thereby cementing training).

### Industry Coach / Mentor

In combination with a COOP / Intern placement, Industry needs to take a focused and active role in coaching and mentoring. Proximity (i.e.: the student is at the site) and Relevance (i.e.: the student is working on high impact company projects) provide a powerful catalyst for learning and (more importantly) for motivation to teach.

Students who combine a 12/16 month COOP / Intern position, gain valuable practical experience that is very hard to simulate in the University environment.

## TECNOLÓGICO DE MONTERREY

Shared by [Dr. Manuel Indalecio Zertuche Guerra](#)



### Challenge Based Education

Active experiential learning with participation from both university instructors and companies.

### Master of Engineering Management

Traditional university course training combined with a company development project.

## UNIVERSITY OF DENVER

Shared by [James Holston](#)



### Grand Challenge Scholars Program

The School has adopted the NAE GCS rubric and will have its first cohort of 20 students next year. Strategic plan envisions all students having GC experience starting in 5 years.

### RSECS 5 Year Strategic Plan

The School completed a comprehensive five-year strategic plan which the Trustees have affirmed in the past few months. The Plan covers research cluster growth, undergraduate curricular and co-curricular modernization, new professional programs and inclusive excellence.

## UNIVERSITY OF EXETER

Shared by [Paul Blackmore](#)



### Green Consultants

An international award-winning program, part of a portfolio of sector-focused training and micro-internships program designed to supply work-ready students to companies.

In less than 3 years, 1,000 students have been through a competitive application process and 300 have carried out sustainability audits across hundreds of businesses.

[www.exeter.ac.uk/greenconsultants](http://www.exeter.ac.uk/greenconsultants)

### eXFactor for STEM students

1 day work authentic assessment-centre for all 1st year STEM students to immerse and promote understanding of the relevance of their higher education experience to the labor market.

Over 10,000 STEM students have completed eXfactor in 5 yrs. Number of students gaining internships increased by 40% and graduates entering graduate level employment increased by 10%.

[www.exeter.ac.uk/careers/events/exfactor/](http://www.exeter.ac.uk/careers/events/exfactor/)



## TOTAL

Shared by [Dr. Andrew Hogg](#) and [Dr. Vincent Saubestre](#)

### Total International Scholarships Program

Since 2004, Total has funded students – more than 1000 to date – to continue their studies abroad, through the Total International Scholarship Program. Through this initiative, students from around the world get the chance to pursue their higher education studies, mainly in France, find out about Total, learn about the energy industry and also experience working in a cross-cultural environment.

[www.campus.total.com/en/action-education/international-scholarships-program#sthash.7IH61Wsg.dpuf](http://www.campus.total.com/en/action-education/international-scholarships-program#sthash.7IH61Wsg.dpuf)

### Total Chairs Program

Total is committed to supporting universities' education or research priorities on topics linked to the challenges faced by the company and society at large. Through our Chairs program we aim to build long-term relationships with innovative institutions and thought leaders in the countries where we operate. We finance, or co-finance, around 30 professorships or research posts in institutions around the world, usually for three to five year terms.

[www.campus.total.com/en/action-education/professorial-and-research-chairs#sthash.QIpUmAl0.dpuf](http://www.campus.total.com/en/action-education/professorial-and-research-chairs#sthash.QIpUmAl0.dpuf)

### Team Total

Team Total has been running annually since 2016. Our grants have helped students with their studies, extra-curricular fun and humanitarian projects, and enabled student associations and student chapters to organize a range of activities, from field trips to participating in international conferences.

In the 2016/17 edition, there were 4 different Team Total grants, with a total of over €80,000 of funding for the selected projects:

- PUSH YOUR LIMITS – Funding to take part in a sporting competition, adventure challenge or cultural event
- INNOVATE – Support for student organizations with a passion for innovation and sustainable energy who want to bring a new idea to life
- OUTREACH – Funding for projects which aim to improve living standards in your community or overseas
- DREAM TICKET – Support for geosciences and petroleum engineering student associations to complete study trips, international conference participation or professional development activities

[www.campus.total.com/en/our-people/team-total](http://www.campus.total.com/en/our-people/team-total)

# INITIATIVES

## **Oil Sands Leadership Initiative - IGEM Competition**

Engaging biotech students to address some highly technical challenges to process oil sands production in Alberta. Run over two years – mobilized students from prestigious universities around the world and enabled them to have a balanced approach to address extremely important environmental challenges.

[www.onepetro.org/conference-paper/WPC-20-2509](http://www.onepetro.org/conference-paper/WPC-20-2509)

## **Oil Sands Leadership Initiative – Sustainable Communities**

Getting undergraduate students involved in an experiential learning approach to create interest in education at the primary school age level in an aboriginal community in Northern Alberta.

Mobilized the community around the children. Empowered young adults to think big and provided mentoring to structure non-profit organization (Sekwheha).

[www.sciconnect.ca](http://www.sciconnect.ca)

## UNIVERSITY OF LEEDS

Shared by [Prof. Peter Jimack](#)



UNIVERSITY OF LEEDS

### Engineering Employability Team

We have introduced a team of 4 dedicated staff across the College of Engineering to support employment opportunities for our undergraduate students PRIOR to their graduation. Working with employers, we have increased the number of students undertaking a year-long industry placement by over 400% in 4 years (with similar results for summer internships).

[https://engineering.leeds.ac.uk/info/201483/working\\_with\\_business/20/](https://engineering.leeds.ac.uk/info/201483/working_with_business/20/)

## UNIVERSITY OF MALAWI - THE POLYTECHNIC

Shared by [Dr. Theresa Mkandawire](#)



### Industrial Attachment for All Students in Year Four

All students in engineering go for an industrial attachment for the second semester. Students are given an industrial supervisor and an academic supervisor since the last year. Both students and employers have appreciated this approach as both industry and the university are involved in training the student.

### Formation of an Industry Partner Advisory Board

Under the Biomedical engineering program, with collaboration with Rice University, this Board has been established (2015). They provide research problems. Students therefore solve real challenges faced by industry in their projects and internship.



# INITIATIVES

## UNIVERSITY OF MIAMI

Shared by [Dr. Jean Pierre Bardet](#)



### Johnson & Johnson Collaborative Laboratory

The University of Miami (UM) College of Engineering has announced the creation of a 3-D Printing Collaborative Laboratory in collaboration with Johnson & Johnson Services Inc. The space will allow the realization of cooperative, educational and research opportunities for students, as well as faculty researchers in multiple disciplines. An impact of the initiative is the development of additive manufacturing solutions for personalized healthcare.

[www.coe.miami.edu/university-of-miamis-college-of-engineering-collaborates-with-johnson-johnson-to-support-innovation-and-creativity/](http://www.coe.miami.edu/university-of-miamis-college-of-engineering-collaborates-with-johnson-johnson-to-support-innovation-and-creativity/)

### Senior Design Expo

The Senior Design/Capstone course is a culminating design project required of all undergraduate students at the University of Miami, College of Engineering. Working in interdisciplinary teams and under the guidance of faculty and industry professionals, students designed and built solutions to address real-world challenges – including prototypes, new designs or new processes.

[www.coe.miami.edu/senior-design-expo-2017-success-winners-senior-design-and-capstone-projects/](http://www.coe.miami.edu/senior-design-expo-2017-success-winners-senior-design-and-capstone-projects/)

## UNIVERSITY OF MINNESOTA

Shared by [Prof. Samuel Benjamin Mukasa](#)



UNIVERSITY OF MINNESOTA

### Joint K-12 Outreach Program by University of Minnesota and Boston Scientific

University of Minnesota science and engineering students lead a K-12 outreach effort in partnership with engineers at Boston Scientific. Our students are learning to be role models. The interaction of 18-22-year-old students with middle-school students is proving to be magical. Middle school students are developing a love for STEM with strong role models.

The interaction between industry and our university students does not have to be limited to internships/co-ops; much can be learned from joint outreach efforts.

## UNIVERSITY OF NOTRE DAME

Shared by [Prof. Dr. Peter Kilpatrick](#)



### Master's Degree in Science, Technology, and Engineering Entrepreneurship

The Master's Degree in Science, Technology, and Engineering Entrepreneurship is a 12-month intensive MS LAUNCHED degree in entrepreneurship, including business model canvas, market channels, competing technologies and business plan and launch. The degree has resulted in:

- More than 200 alumni in 8 years, more than 40 each year
- Many new companies launched

[esteem.nd.edu/](http://esteem.nd.edu/)

### Rapid Prototyping ME Lab Courses

New teaching lab courses for all sophomore Mechanical Engineering students in rapid prototyping.

## UNIVERSITY OF PORTLAND

Shared by [Dr. Sharon Jones](#)



### MECOP

Member of an Oregon engineering co-operative program that includes four universities and over 100 companies. Students can voluntarily complete two 6-month internships. The impacts of the program have been:

- Increased placement rate at graduation
- Increased capabilities with senior design projects
- Increased industry partnerships besides MECOP

[www.mecopinc.org](http://www.mecopinc.org)

### Externally-sponsored Senior Capstone Projects

3-course sequence that matches students with senior capstone projects pitched by industry, government agencies, and non-profits. The impacts of the program have been:

- Increased industry partnerships
- Increased student motivation for projects
- Increased revenue for School

# INITIATIVES

## UNIVERSITY OF SOUTHERN CALIFORNIA

Shared by [Prof. Dr. Yannis Yortsos](#)



### Engineering +

Engineering as the enabling discipline of our times.

[viterbischool.usc.edu/engineering-plus](http://viterbischool.usc.edu/engineering-plus)

### Engineering Diversity

Enabling an increase in the diversity of the engineering pipeline.

[viterbischool.usc.edu](http://viterbischool.usc.edu)

## UNIVERSITY OF TORONTO

Shared by [Prof. Cristina Amon](#)



### Multidisciplinary Capstone Design Project (MCP) course

Projects proposed by industry partners, MCPs offered through UT-IMDI. In the past 4 years, more than 350 students from across all undergraduate engineering programs have participated in the MCP course, and there has been collaboration with 38 industry clients on 78 projects.

[imdi.mie.utoronto.ca/about-course-mcp](http://imdi.mie.utoronto.ca/about-course-mcp)