EEE SAC - Student Advisory Council seeking Applicants

EEE Class of 2021: The EEE Student Advisory Council (EEE SAC) is seeking to fill 2 sophomore representative seats. The mission of the SAC is to encourage and enhance communication from the student body to the Head, Dr. Sutherland. Student representatives on the council act as liaisons for the student body and bring forth “consensus” issues that pertain to student morale, student perspectives on the curriculum, and the learning environment as well as hosting events pertaining to these issues. Our focus is on seeking opportunities for growth and improvement within EEE. This includes reaching out to relevant groups and hosting events for students, faculty, and the administration.

If you have any questions, please contact a current SAC member: Nate Ibarluzea, Jennifer Pohlman, Treann Quick, Emerson Ringger, Ali Whitehead. Questions are encouraged! Please consider this important opportunity to serve your academic program and fellow students.

- The application is now open at https://www.surveymonkey.com/r/X8Z9LCG. The application will close on Thursday, September 13 at NOON. Those selected will be notified by email.

Requirements of candidates:
- Must be an enrolled EEE student
- Must currently be in good academic standing with the University
- Must be willing to demonstrate leadership qualities
- Must attend meetings (~2/mo)
- Must assist with occasional events (training provided)
- Must be an active member of the EEE community, or be willing to become more involved

Job Corner with Ms. Whelton, PE

This section is prepared for the newsletter by Ms. Margaret Whelton, PE. She is the EEE Manager of Industrial Experience. The responsibilities of this position include working with industry to secure internships, co-ops, and full time job opportunities for students; developing real world senior design and research projects; and facilitating partnerships between industry and Environmental and Ecological Engineering. She has twelve years of experience as a practicing environmental engineer prior to becoming part of EEE. She is a registered professional engineer in Indiana, Virginia, and Alabama.

Please note that Ms. Whelton is currently on maternity leave.

IR Update

- First of all, again they want you to register for the career fair prior to the event.
- Last year, not everyone had a button and companies (at least everyone I spoke with) talked to people without buttons. I suspect it will be the same this year, but I cannot guarantee it. Information on where to obtain a button is given once you register. This is to counteract other colleges bringing buses of students (i.e. nonPurdue college students) to IR.
There is a new app this year--everyone will need to get “careerfairplus”. Here is a link to the app: https://app.careerfairplus.com/pu_in/ if you do not see the Purdue career fairs, type in Purdue at search and select Industrial Roundtable 2018.

Seminars: Monday, September 10th

- 2:30 AM to 9:30 PM, each seminar is 50 min in duration
- In the Stewart Center, 2nd and 4rd floors

Career Fair: Tuesday and Wednesday, September 11th and 12th

- 9:00 AM to 4:00 PM at Memorial Mall Go here to register for IR: You can register here: https://purdue.ca1.qualtrics.com/jfe/form/SV_00x3prRoTT5fgb
- For information on companies (which you can sort by majors listed or citizenship status), look here: https://app.careerfairplus.com/pu_in/fair/1138/employer/109489
- There is NO printed guidebook again this year! The above link to the app currently is the only thing, which includes all the information IR has on companies.
- The app gives you all the information, except for the informational sessions. They just put up the booth location of companies and it is ONLY found in the app! This is also the ONLY place where you can find specific company locations. They have hyperlinked the app map (I assume they will do this again this year once booth locations are uploaded) so that you see specific company locations by clicking on a number. Here is a link to a hard copy map of IR: http://www.purdueesc.org/wp-content/uploads/2018/09/2018_IR_Map-v3.pdf
- The app is for both IPhone and Android) that I suggest you get if you have not already: “Career Plus”

Note: this is a new app this year. Everyone will need to download it!

Tips:

- Remember, EEE is relevant to all companies, but not everyone knows about EEE, or the recruiters (not coming to IR) who signed the company up last April for IR did not include us as a major they are looking for.
  - Look at the EEE list, but also Environmental Health Sciences, CE, ABE, and ChE. Not every company will be applicable but there will be some that are definitely looking for environmental folks, but did not know about EEE.
- Remember do not say EEE to the company--they don’t know what that is and think you are talking about electrical engineering.
  - Be sure to identify your major as environmental and ecological engineering (the stand-alone environmental engineering major at Purdue). No one outside of Purdue knows what EEE is.
  - EEE is the stand alone environmental engineering major at Purdue.
- Larger companies (especially those that recruit for the “more widget based engineering majors”) will fill up their interviewing spots at IR early in the day on Tuesday. Unfortunately, you should plan accordingly.
- Allegion will be looking for a new EEE coop at IR!
  - Their current EEE coop is graduating and they would love to have another! Coops are a great way to gain experience, more than you would with an internship. They are usually pretty packed-so get there early if you are interested.
  - Kimberly Clark will also be looking for an EEE coop(s) so visit them too to show your interest if you have a chance. Their formal process for EEE coops will occur when I (Ms. Whelton) return from leave.

Companies to Visit:

- Evonik
- GM
- General Mills
- John Deere (multiple EEEs generally intern here every year and there is a full time EEE)
- Land O’Lakes
- Nestle
- Caterpillar
- Phillips 66 (support EEE monetarily)
- Exxon Mobil
- Schlumberger
- Kimberly Clark (3 current EEEs in coop here)
- Cummins (LCA work)
- GM (EEEs have interned in the past, and there is one full time EEE)
- Fluor (water/wastewater)
- CHA (consulting firm, has hired EEE interns and full time in the past)

*Remember if they make something, they need an environmental engineer!*

*Pay attention to other info sessions and visit companies on the engineering lawn like John Deere if you can.*

### Society of Women Engineers Networking Night *

- Engineering students are invited to attend Networking Night, scheduled for:
  - **Monday, September 10 from 7-9PM in ARMS Atrium.**
  - Register by 9/7; Use QR code on attached NETWORKING NIGHT flyer.
- This event is hosted by the Society of Women Engineers. Networking Night is an excellent opportunity for students to meet and network with company employees in a personal, business casual setting before IR.
- Mock interviews will be provided for students on a first come first serve basis, as both a practice for interviewees and a scouting opportunity for company representatives. Drop by for advice on your interview style and elevator pitch while learning what companies are looking for at IR from real-world company representatives!

### Industrial Roundtable Information and IR Prep Night from PESC *

- PESC has provided information on how to prepare for the Industrial Roundtable career fair. See attached flyer.
- IR is Tuesday, September 11th and Wednesday, September 12th. Seminar presentations from various companies will take place Monday, September 10th.
- Unsure of how to approach company representatives? Need feedback to improve your resume? Join PESC the week before Industrial Roundtable at IR Prep Night to learn more about the career fair and how to prepare!
- There will be presentations by this year’s IR Director as well as representatives from the CCO.
- PASE and the Krannert Professional Development Center will be sponsoring a Mock Career Fair, where students can get professional photographs taken, have their resume reviewed, and practice talking with company reps.
- The IR Prep Night will be on **Wednesday, Sept. 5th from 5:00pm - 7:00pm in the PMU North Ballroom.**

### IR Employer Seminars *

- Sandia National Laboratories: Monday, September 10th, 2:30 pm. For all interested B.S., M.S. and Ph.D. engineering and science students. Bring your resume.
- Parker Hannifin Corporation: Monday, September 10th, 3:30 pm. Learn more about possible career paths in:
  - Engineering Leadership Development Program
  - Environmental Health & Safety
  - Information Technology
  - Lean Manufacturing Engineering
  - Quality Engineering
  - Technical Sales
- Steel Dynamics: Monday September 10th, 6:30 pm
  - Former interns will speak about their experiences at the seminar
- Ensign-Bickford: Monday, September 10th, 3:30 pm
  - Company presentation with Q&A
  - Fields ranging from space exploration to agriculture and pet food
- Stewart Center - There are seminars from companies throughout the day on Monday, September 10th. Ensign-Bickford and Steel Dynamics reached out to EEE specifically. See flyers attached for both company seminars.
- Sandia National Labs: 2:30 pm, Stewart 311
- Other companies will likely continue to send out info in the next two weeks, so keep an eye out for any emails from Tammi related to IR and company seminars.
ISPC Apply Online Fest *

- Friday, September 7th; ME1061
- Bring a resume and a laptop
- Learn job application strategies prior to IR
- Free food

Purdue Writing Lab: Improve Your Resume 2

Workshop: Improve Your Résumé 2
Wednesday, September 12th | 1:30 - 2:30 PM
HEAV 220

We are holding an additional session of our workshop, “Improve Your Résumé” on Wednesday, September 12. The workshop will cover the same material as the Sept. 5 workshop; therefore, you may not attend the September 12th workshop if you attended the Sept. 5 workshop.

Résumés speak on your behalf. Come to this workshop to learn how to get started or enhance your job documents! Free and open to all Purdue students, staff and faculty. Registration is required, so sign up online at https://cla.purdue.edu/wlschedule and choose the “Group Workshops” schedule from the menu.

EcoMake Purdue *

- Weekend long design competition focused on sustainability.
- Friday, October 12th at 6:30 pm to Sunday October 14th
- Must apply by September 30th at 11:59 pm at ecomake.org
- 7 meals and all resources for design projects included
- See attached flyer for more info

Wabash River Sampling Blitz *

- The Wabash Sampling Blitz is coming up soon! The Blitz will be September 14th from 2:30-5:00 pm.
- Join 250 volunteers to collect a snapshot of the water quality of the Wabash River, Wildcat Creek, Deer Creek, and their tributaries. Volunteer with a friend, your family, or alone and we'll assign you a partner. Volunteer to sample your local stream, your favorite canoe spot, or try a new stream within the Wabash River, Wildcat Creek or Deer Creek watersheds.
- Volunteers will be given all materials necessary to collect water samples and take measurements of water quality. Sampling takes about 1 - 1 1/2 hour. Start any me after 2:30 pm. Sampling is fun and volunteers learn more about our local environment and the health of our waterways!
- You may get wet so make sure you bring shoes that can get wet such as rubber boots or waders if you have any.
- Once registered, you will receive an email with your staging location and group
- Read more and Register at http://www.wabashriver.net/wabash-sampling-blitz/

LEED Green Associate (GA) Training *

EEE students should understand that LEED is one professional certification. Earning a PE license in engineering requires considerably more education, knowledge and experience, and all EEE graduates are qualified to eventually earn a PE license, which is significantly more valuable. On occasion, an EEE student will ask about LEED. LEED is more within the domain of the Arch Engr group within Civil. Most people can take a short course and pass the LEED certification test. As a courtesy, the following info is being provided. It is not required or necessarily endorsed. The LEED Green Associate (GA) credential is the only entry level sustainability designation and shows employers and clients that you have certified knowledge in the green building industry.

- When: September 25th 6-10pm in EE 115
- Cost: $200 for full time students
- Registration: http://leadinggreen.com/Purdue/
- More info: see attached
- LEED (Leadership in Energy and Environmental Design) is simply a green-rating point system, or a scorecard. The more energy efficient and sustainable a building is; the more points it will earn. To date, this course and its materials have
proven to be instrumental in helping over 8000 students pass their respective exam. This course is offered at a quarter of the price and time as the competition.

**Big Ten Grad School Expo**

- Specifically geared towards students interested in attending graduate school in the fields of Engineering, Technology, Science, Mathematics, and related fields.
- September 30th-October 1st
- Schedule of events and more information can be found at https://www.purdue.edu/gradschool/gradexpo/documents/2017ExpoProgram-web.pdf
- Registration deadline: September 14th. Register at https://www.purdue.edu/gradschool/gradexpo/student/registration.html

**ACRP University Design Competition** *

- Airport Cooperative Research Program is putting on a design competition to address airport needs
- First place receives $3000, second place receives $2000, and third place receives $1000. Winners will present designs at the National Academies of Sciences, Engineering, and Medicine in Washington, DC.
- More information can be found at http://vsgc.odu.edu/ACRPDesignCompetition/index.html
- See attached flyer.

**EPA Campus RainWorks Challenge**

- The EPA is pleased to announce the rules for the 6th annual Campus RainWorks Challenge, a design competition open to U.S. colleges and universities. EPA seeks to engage undergraduate and graduate students in designing innovative green infrastructure practices that will showcase a variety of environmental, economic, and social benefits.
- Registration opens Sept. 1, visit https://www.epa.gov/campusrainworks and review the competition brief for more information.

**BGI Football Recycling** *

- Help Boiler Green Initiative facilitate recycling at Purdue football games.
- Free entrance to the game and free t shirt for volunteering.
- Go to bit.ly/bgifootballrecycling for more information.

**NISO Week Sept 18-22** *

- This is a bundled week of information sessions on the distinguished awards NISO coordinates and how to secure Purdue campus endorsement.
- Apply now as an undergraduate. Reward your STEM research with a Goldwater or Astronaut Scholarship; finance your study of a language abroad with a Boren, Critical Language Scholarship, or Gilman Scholarship.
- Jumpstart your career in environmental concerns or in Native American tribal policy with a Udall Scholarship; go to graduate school for the arts, humanities or social sciences on a Beinecke Scholarship; or bring your commitment as a leader for change, no matter your discipline, to graduate school with a Truman Scholarship.
- See attached flyer for more details.
NETWORKING NIGHT
MONDAY SEPTEMBER 10TH
ARMSTRONG ATRIUM 7-9 PM

➢ NETWORK WITH COMPANIES BEFORE IR
➢ PRACTICE INTERVIEWING WITH REAL COMPANY REPRESENTATIVES
➢ FREE FOR DIVERSITY ORGANIZATION MEMBERS

REGISTER WITH THE QR CODE BY 9/7

CONTACT CORIN SMITH AT SWE@PURDUE.EDU WITH QUESTIONS
PESC presents the annual Industrial Roundtable

**Seminar Presentations:**
- Monday September 10th
- 2nd and 3rd floor of Stewart Center
- 126 companies presenting and all students are welcome:
  - General Motors
  - John Deere
  - Microsoft
  - Boeing
  - Pepsi Co.
- Great opportunity to get face time with company representatives before the fair!

**Career Fair:**
- Tues. Sept. 11th & Wed. Sept. 12th
- Location: Memorial Mall
- Dress: Business Casual
- What to Bring: Resume, Elevator Speech
- How to Prepare:
  - Attend IR Prep Night (Wed - 9/5). PESC presentation geared towards getting the most out of IR
  - Have your resume reviewed by the CCO, YONG 132, M-F, 1-4pm
  - Research companies of interest
  - Have a plan of who you want to talk to during the fair
  - Get the IR “Purdue Career Fair Plus” Fair App (For Android & iPhone)
Monday, September 10
Information Session
2:30pm – 3:30pm
Stewart Center, Room 311

BRING RESUMES!

For all interested B.S., M.S. and Ph.D.
engineering and science students.

Many positions open for internships, co-ops,
and full-time employment.

Most positions require U.S. Citizenship

sandia.gov/careers
Together, we can advance technology and careers simultaneously.

As the global leader in motion and control technologies, Parker is focused on engineering the success of 57,000 team members in 50 countries around the world.

Please join us for the
Parker Hannifin Corporation Industrial Roundtable Seminar
Monday, September 12, 2018
Stewart Center
3:30 PM

• Learn more about Parker’s business and technologies
• Learn how some of our engineers use their degree at Parker
• Get a feel for some unique ways your major lines up with Parker’s business
• Learn more about possible career paths in:
  ✓ Engineering Leadership Development Program
  ✓ Environmental Health & Safety
  ✓ Information Technology
  ✓ Lean Manufacturing Engineering
  ✓ Quality Engineering
  ✓ Technical Sales

Parker’s engineering expertise spans the core motion and control technologies – electromechanical, hydraulic and pneumatic – as well as a full complement of fluid control systems; software and electronic controls; filtration systems; and refrigeration, instrumentation and sealing technologies. We provide precision engineered solutions for a wide variety of mobile, industrial and aerospace markets.

A career at Parker offers unlimited potential for professional and personal growth. You will work with the brightest minds in the world, help develop innovative technology and products, and contribute to our company’s goal of solving the world’s greatest engineering challenges. To learn more, visit www.parker.com.

An Equal Opportunity Employer: Minority/Female/Disability/Veteran/VEVRAA Federal Contractor
Experience the Steel Dynamics difference!

Monday, September 10th at 6:30pm
Stewart Center

Attend the employer seminar and hear from former interns about their experience working in a growing, fast-paced, successful Fortune 300 company.
Company Presentation

with Q&A

Learn about the opportunities available to join the EBI Family that has been pushing the boundaries of science & technology for over 180 years.

With subsidiaries located across the country and spanning fields from Aerospace and Space Exploration, to Agriculture and Pet Food, you can find the right fit at EBI.

Monday, September 10, 2018
3:30 in the Stewart Center

Visit our website for more information: HTTP://WWW.ENSIGN-BICKFORDIND.COM/
Apply Online Fest!

Organized by the International Peer Coaching Program

- Bring your resume on a laptop to learn job application strategies before IR!
- Apply to companies with trained peer coaches!
- Free food!

Friday, September 7th
Come to ME1061
EcoMake is a sustainability-focused, weekend-long design competition wherein participants will learn to progress from idea to a product in just 54 hours. Students of all majors and backgrounds are encouraged to attend!

From Friday, Oct. 12 at 6:30pm
To Sunday, Oct. 14 at 9:00pm

Located at Purdue Honors College and the Bechtel Innovation Center

Free tickets include 7 meals, and all resources necessary
Apply online at ecomake.org
Application portal closes Sept. 30, at 11:59pm

Sponsors:

Contact ecomaketeam@gmail.com for any questions
Wabash Sampling Blitz
2:30-5:00 PM
Friday, September 14

Calling all citizen scientists! Join us for a day of science where volunteers collect and test water samples from over 200+ sites along tributaries draining to the Wabash River. Sampling equipment is provided, no experience necessary!

Visit wabashriver.net/blitz-registration to sign up or contact us at resources@wabashriver.net or 765.420.8505

Get more info here!
LEED®
GREEN ASSOCIATE
TRAINING

LEED (Leadership in Energy and Environmental Design) is a sustainability scorecard for green buildings. The LEED Green Associate is the best professional designation to show employers and clients that you have certified knowledge in the field.

WHEN
September 25 2018 – 6:00 PM to 10:00 PM
WHERE
Purdue University – EE – Room 115
REGISTRATION
Leadinggreen.com/Purdue

TO REGISTER VISIT
www.LeadingGreen.com

CONTACT THE INSTRUCTOR
Lorne Miotek
BASc., LEED AP BD+C, O+M
info@leadinggreen.com
416 824 2677
585 764 5423

-Perfect for all levels of study/experience
-10,000 Past participants
-100% Passing rate when following our 3-step study process

$200
For full time students

$300
Non-students
(Comparable courses start at $700)

COURSE INCLUDES

400 Realistic practice exam questions
Updated to LEED V4

Class recordings and on-demand assistance from our LEED AP+ Staff

Comprehensive study guide designed to prepare you for exam success

In-class instruction involving LEED overview and detailed exam preparation including tips for exam registration
ABOUT THE INSTRUCTOR

Lorne Mlotek BASc., LEED AP BD+C, O+M

Lorne Mlotek studied Civil Engineering at the University of Toronto, specializing in Building Science and Integrated Design. Over the past 7 years, he has contributed to the green building industry by working as a sustainability consultant with Smith and Anderson Footprint, as a developer with Provident Energy Management (a division of Tridel), and as a designer at Morrison Herhsfield. Lorne has acted as an engineering consultant on over 25 sustainable projects pursuing LEED, Energystar, and BOMA BESt certifications. Currently, Lorne owns and operates LeadingGreen Training and Consulting, a business he founded back in university.

At that time, the only LEED preparation courses available started at $700, a high cost that he recognized to be an obstacle in encouraging the widespread adoption of LEED. Since then, Lorne has taught energy modelling, building science, and over 170 LEED training courses to over 8000 participants across North America. Following his studying method, participants have gone on to pass their GA or AP+ exams with no trouble. Lorne has also partnered with over 100 companies and post-secondary institutions across North America to teach sustainability topics to students and professionals. Lorne is committed to increasing education, which he believes will lead to greater recognition of LEED's financial merits, growth in green collar industries, and an overall increased market demand for green buildings. Lorne is currently working on a recruiting company specializing in sustainable opportunities.

OFFICE ADDRESS:
B740 Sandford Fleming Building, 10 King’s College Road, Toronto ON M5S 3G4
E-mail: info@leadinggreen.com

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LEED GA

Topics Covered

Introduction to Sustainability in the 21st Century
- The causes and effects of climate change due to global warming
- The distinction between energy production and consumption
- The role that the built environment plays as the largest consumer of energy and largest producer of greenhouse gases

Introduction to LEED (Leadership in Energy and Environmental Design)
- How LEED is used to reduce the footprint of the built environment
- How LEED creates a more economical building and healthier environment for occupants
- The origins of LEED, and its current certification process and point system
- The tools and standards incorporated in LEED, which result in a holistic green building standard
- How to market yourself as a LEED professional

Location and Transportation (Impact Category #1)
- Choosing a site that will minimize a building's impact on the environment due to automobile dependence and urban sprawl
- Integrate a building into existing infrastructure and public transportation systems

Sustainable Sites (Impact Category #2)
- Maximizing open spaces that can be used by the occupants
- Reducing storm water runoff and reducing cooling loads by minimizing the Heat-Island effect
- Minimizing light pollution to reduce energy loss and off-site disturbances

Water Efficiency (Impact Category #3)
- Reducing potable water consumption by installing low-flow fixtures and reusing water
- Reducing potable water used for irrigation and treating waste water on site
- Benefits and incentives of monitoring water consumption

Energy and Atmosphere (Impact Category #4)
- Using building modeling software and on-going metering to estimate and record energy usage
- Reducing a building’s energy loss
- Sourcing energy from on/off-site renewables
- The necessity of building commissioning and refrigerant management for LEED

Materials and Resources (Impact Category #5)
- Reducing construction demolition waste
- Setting up recycling systems for occupants
- LEED’s Building product disclosure and unique optimization approach for material selection
- Environmental Product Declarations and benefits of local materials

Indoor Environmental Quality (Impact Category #6)
- Minimizing indoor air pollution to increase occupant comfort, health and productivity
- Awarding of points for optimal lighting, comfort, and thermal control
- Strategic placement of windows for optimal daylight and views to improve environmental quality

Innovation in Design and Regional Priority (Impact Category #7)
- Sustainable strategies, which are out of the scope of LEED
- Exemplary performance points for exceeding credit requirements
- Points for fulfilling credits that are important to specific regions

Materials Overview, Exam registration and Exam-Writing Tips&Tricks
- Self-studying for the exam, following an exact procedure to ensure a passing grade
- Registering for the exam through the USGBC, and choosing the best location
- The most effective strategy during the exam
What is Sustainability?

“Meeting our NEEDS, and the NEEDS of future generations”

The Triple Bottom Line is the key to sustainable design and construction, ensuring that the wants and needs of the environment, economy and society are all satisfied.

What is LEED?

LEED stands for Leadership in Energy and Environmental Design and is a scorecard for green buildings. The more sustainable the building is, the higher the level of certification it can achieve.

The LEED rating systems are based on points, which can be earned by meeting specific credit requirements in 6 different categories. Highlighting the 6 areas for improved environmental performance, LEED emphasizes a holistic approach to sustainable building.

1. Sustainable Site Development
2. Water Efficiency
3. Energy Efficiency
4. Materials Selection
5. Indoor Environmental Quality
6. Innovation

Why Choose LEED?

Proven Performance – LEED certified buildings save money over time through energy conservation, reduced water consumption and increased property value

Environmental Responsibility – LEED is synonymous with sustainability and is the premier way to demonstrate your willingness to make a difference for future generations

Short-term Return – Its low initial cost premium yields high returns on investments, which have faster lease-up rates and can free up potential financial incentives

LEED and its Merits

Market Demand
According to a World Green Buildings Study, 33% of individuals and tenants desired green buildings in 2012, and this percentage continues to rise every year.

Operations and Maintenance Costs
Buildings are the largest consumers of energy. As utility prices rise, it is essential to consume less and save more. The LEED rating systems involve an integrative approach that encourages interaction between all stakeholders early on in the project to promote synergies. The integrative approach effectively ensures that all aspects of the Triple Bottom Line are met: the result is a cost-effective building optimized for environmental sustainability and quality of life for the occupants.

Competitive Advantage
As environmental sustainability becomes increasingly popular, LEED is a highly sought-after designation that sets projects apart from the crowd. It is a strong marketing tool that represents your green efforts in one recognizable word. Those who do not build LEED will be left with a building that does not appreciate in value as fast.

LEED Buildings yield:
Average ROI: 9.9% (New), 19.2% (Existing); Reduced Operation Costs: 13.6% (New); 8.5% (Existing) Increased Building Value: 10.9% (New); 6.8% (Existing) Increased Building Value: 10.9% (New); 6.8% (Existing) Higher Occupancy rates: 16% - 18% higher than non-rated; Robust Tenants: Green buildings retain their occupants at consistent rents through economic trials (IE. 2007-2009)
Introduction

The Airport Cooperative Research Program (ACRP) is sponsoring a national competition for universities that engages students in addressing issues relating to airports and the National Airspace System.

This Competition challenges individuals and teams of undergraduate and/or graduate students working with faculty advisors to consider innovative approaches related to these challenges.

Submitters should design innovative solutions that focus on addressing airport issues and constraints that would enhance the management, safety, capacity and efficiency of the nation’s airports.

Subject Areas

The Competition focuses on design solutions addressing airport needs in the following broad areas:

• Airport Operation and Maintenance
• Runway Safety/Runway Incursions/Runway Excursions
• Airport Environmental Interactions
• Airport Management and Planning

Background and some specific challenge areas are defined in the Technical Design Challenges section.

Students are not limited to the suggested topic areas and are free to consider design solutions in related topic areas as long as they are consistent with the four broad challenge areas.

As part of the required literature review, participants are encouraged to explore past ACRP research reports to see what ideas have already been presented and studied.

The competition website is the participant’s source for complete and up-to-date information.

First Things To Do

Go to www.nap.edu/author/ACRP/transportation-research-board/airport-cooperative-research-program to learn about the latest studies on topics of interest to the Airport Cooperative Research Program (ACRP).

Previous studies relevant to your chosen topic will be an important start to your literature review. By getting the latest information, you can gain a foundation for exploring possible topics and building innovation into your design.

Important and useful short tutorials on doing the required Safety Risk Assessment and Cost/Benefit Analysis for your design proposal are available on the Competition website.

Know that the website has excellent connections to expert advisors you can contact. Note that you are required to have interactions with industry advisors.

The Competition requires interaction with an airport operator. The Virginia Space Grant Consortium staff is able to help you link with airport operators. Email acrp@odu.edu with your request.

The ACRP Design Competition website: (vsgc.odu.edu/ACRPDesignCompetition) contains:

• Competition Guidelines
• Links to ACRP and Federal Aviation Administration (FAA) Reports and Resources
• Online Design Submission Process
• Expert Advisors in Challenge Topics
• Online Notice of Intent Electronic Submission Form
• Link to Winning Designs from the 2007-2018 Competition Years
• Contact Information for Queries
• Instructional videos on the required Safety Risk Assessment and Cost/Benefit Analyses

Competition updates will be posted on the website.
**Competition Goals**

1. Raise awareness of the benefits of the ACRP and the importance of airports and the FAA to the National Airspace System infrastructure.

2. Increase the involvement of the academic community in the ACRP and addressing airport operations and infrastructure issues and needs.

3. Engage students at U.S. colleges and universities in the conceptualization of applications, systems and equipment capable of addressing related challenges in a robust, reliable and comprehensive manner.

4. Encourage undergraduate and graduate students at U.S. colleges and universities to contribute innovative ideas and solutions to issues facing airports and the National Airspace System.

5. Provide a framework and incentives for quality educational experiences for university students.

6. Develop an awareness of and interest in airports and aviation as vital and challenging areas for careers in engineering and technology.

**About the ACRP**

The Airport Cooperative Research Program (ACRP) carries out applied research on problems that are shared by airport operating agencies, not adequately addressed by other federal research programs. The ACRP undertakes research and other technical activities in a variety of airport subject areas involving administration, environment, legal, policy, planning, safety, human resources, design, construction, maintenance, and operations at airports. ACRP is able to draw on its targeted research to help U.S. university students be engaged in contributing innovative approaches to issues facing our nation’s airports and the National Airspace System.

Airports are vital national resources. They serve key roles in the transportation of people and goods and in regional, national, and international commerce. They are where the nation’s aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research continues to be necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry.

The ACRP was authorized in December 2003 as part of the Vision 100 - Century of Aviation Congressional Reauthorization Act.

**About the FAA**

The FAA is part of the Department of Transportation and is responsible for the safety of civil aviation. The activities of the FAA include:

- Regulating civil aviation, including commercial service airports, to promote safety;
- Encouraging and developing civil aeronautics, including new aviation technology;
- Developing and operating a system of air traffic control and navigation for both civil and military aircraft;
- Researching and developing the National Airspace System and civil aeronautics;
- Developing and carrying out programs to reduce aircraft noise and other environmental effects of civil aviation; and
- Regulating U.S. commercial space transportation.

The FAA provides the framework for a safe, secure, and efficient aviation system. As a leading authority in the international aviation community, the agency is responsive to the dynamic nature of customer needs, economic conditions, and environmental concerns. The FAA encourages and supports innovative research to improve airport and aviation safety, improve aviation capacity, and reduce environmental impact.

The FAA provides funds to the ACRP to support this Competition.
**Competition Partners**

The ACRP gratefully acknowledges the contributions of the following partnering organizations that supply expert advisors for teams, assist in dissemination of the Competition opportunity to organizational members, and participate in design reviews.

**The American Association of Airport Executives (AAAE)**

AAAE is the largest professional organization for airport executives in the world, representing thousands of airport management personnel at public use airports nationwide. The organization’s primary goal is to assist airport executives in fulfilling its responsibilities to the airports and communities they serve.

**The Airport Consultants Council (ACC)**

ACC is an international trade association representing more than 240 companies that provide development and operations-related consulting and product services to airports and other aviation system stakeholders. Members offer architectural, engineering, planning, security, environmental, financial, management, economic and construction services, products and equipment.

**The Airports Council International - North America (ACI-NA)**

ACI-NA is a membership organization representing approximately 160 state, regional, and local governing bodies that own and operate the principal airports served by scheduled air carriers in the United States and Canada. ACI-NA member airports handle approximately more than 95 percent of the domestic and virtually all of the international air passenger traffic and cargo traffic in North America.

**The National Association of State Aviation Officials (NASAO)**

NASAO was founded to ensure uniformity of safety measures, to standardize airport regulations and develop a truly national air transportation system responsive to local, state, and regional needs. The organization represents the men and women in state government aviation agencies who serve the public interest in all 50 states, Guam, and Puerto Rico.

**University Aviation Association (UAA)**

UAA is the voice of collegiate aviation education to its members, the industry, government and the general public. Through the collective expertise of its members, this nonprofit organization plays a pivotal role in the advancement of degree-granting aviation programs that represent all segments of the aviation industry.

The Competition is managed for the ACRP by the Virginia Space Grant Consortium based in Hampton, Va. (vsgc.odu.edu).

**Overall Requirements**

The ACRP University Design Competition for Addressing Airport Needs is open to teams or individuals from accredited U.S. colleges and universities who are working with a faculty advisor.

The Competition will be open for student participation from August 2018 through April 29, 2019, allowing participation during fall semester 2018 and/or spring semester 2019. Final due date for all submittals is April 29, 2019. All submissions will be judged after the due date.

Challenges might typically be addressed as part of a senior design class or independent study option or through other academic venues, including faculty-mentored, college-based student chapters of professional societies.

The Competition requires evidence of interaction with both airport operators and industry experts for feedback on the practicality of the proposed design/approach. Links to expert advisors are provided on the Competition website. The American Association of Airport Executives is offering assistance in linking students to airport operators. Participants should contact the Virginia Space Grant Consortium at acrp@odu.edu to request assistance.

A key criterion for submittal evaluation is innovation. As part of the required literature review, participants should carefully review and consider previous, related research and proposed problem solutions in formulating and supporting their submission.

The ACRP offers a wealth of research papers and other documents that students should consider in planning their submittal and proposed research approach. Links to previous and current ACRP research are available on the ACRP web site: www.nap.edu/author/ACRP/transportation-research-board/airport-cooperative-research-program. Students should also review previous winning submissions of the University Design Competition for Addressing Airport Needs and its predecessor; the FAA Design Competition for Universities. Links to these resources are provided on the Competition website.

Participants are encouraged to take an interdisciplinary approach to the selected topic and a cross-departmental approach where appropriate. Submissions must be student written and demonstrate a thorough understanding of current conditions/state-of-the-art approaches relevant to the chosen topic. Guidelines for elements of the submittal package are provided on page 11.

vsgc.odu.edu/ACRPDesignCompetition
Note that additional information, resources, and responses to queries will be posted on the Competition website at vsgc.odu.edu/ACRPDesignCompetition. Scoring criteria for submittal review are also posted on the Competition website. The submittal packages should be delivered both electronically and in hard copy with instructions and necessary forms provided on the website.

Notice of Intent: Though not required, participants are strongly encouraged to provide a nonbinding "Notice of Intent," which is submitted electronically through the Competition website. The purpose of the Notice of Intent is to allow Competition staff to assist as needed with providing access to Airport Operators and expert sources that can be of help to the student or student team during the design process. ACRP personnel and members of partnering organizations will serve as resources to design teams or individual participants.

A key goal of the Competition is to enhance the educational experience of participating students. The ACRP believes that by providing access to experts, the educational process can be strengthened; students gain exposure to professionals in the field; and students will be better able to assess the practicality of their designs. The Notice of Intent will also assist the ACRP with planning for the review process to include appropriate subject matter experts. Once a Notice of Intent is received, the faculty advisor will be contacted to see what assistance might be needed.

For maximum effectiveness, the Notice of Intent should be submitted in advance of beginning the design process by September 28, 2018 for projects commencing with the fall semester and January 28, 2019 for projects commencing in the spring semester. A Notice of Intent will be accepted later; however, teams are encouraged to submit by the suggested date.

Technical Design Challenges

I. Airport Operation and Maintenance

The day-to-day operation and maintenance of an airport involves many tasks. Airport operators must handle both routine matters and unusual circumstances. Their responsibilities include keeping records; hiring and training personnel; maintaining pavement; maintaining markings, signs, and lighting; providing snow and ice control, if applicable; managing emergency preparedness; overseeing handling of hazardous materials, including jet fuel; conducting airport self-inspections; overseeing procedures for operation of vehicles on the airfield; providing obstruction lighting; protecting navigational aids; protecting public safety; dealing with wildlife control; and overseeing construction projects.

Almost 20,000 airports are located throughout the United States today. Of those, approximately 8,700 feature paved runways, taxiways and ramps/aprons. Paved airport surfaces can be affected by many things: adverse weather, build-up of rubber residue from aircraft tires, and normal wear and tear. The pavement surface must also be kept free of what is referred to as foreign debris.
This debris can be in the form of such things as rocks and stones tracked onto the pavement surfaces from grass areas adjacent to the pavement, material coming off aircraft during taxiing, landing, or takeoff, and objects blown from the aircraft servicing areas. This debris can cause major damage to aircraft engines if it is ingested or affect the aerodynamics of a propeller.

Airport operators certificated under 14 Code of Federal Regulations Part 139 are required to keep these surfaces in a condition that meets requirements specified in the regulation. These surfaces are inspected visually on a regular basis so any deficiencies can be found and corrected. Some automated systems have been developed to supplement aspects of these visual inspections.

In the interest of safety, an airport surface must be closed for a pavement repair. Runway closures reduce capacity at that airport, affecting carriers that may have to juggle flights to accommodate the repair and inconveniencing non-airline (called general aviation, or simply GA) aircraft that need to use alternate airfields, especially if the closure is unplanned. Any technologies or procedures that either improve the structure/longevity of pavement, increase the speed of repairing pavement, or automatically alert the airport operator to hazardous pavement conditions will be a welcome advance for airports.

This Design category has challenges that focus on new approaches that will help airport operators increase airfield efficiency outside of the terminal and airport buildings. Terminal facilities, exclusive of security, are a secondary consideration. Designs can also consider the potential effects of NextGen on airport operations.

**Airport Operation and Maintenance Challenges:**

A. Exploring new methods for design and maintenance of pavement surfaces. Ideas include, but are not limited to:
   - Methods for innovative pavement repair.
   - Innovative pavement materials, installation and maintenance techniques, including nondestructive evaluation methodologies.
   - Improved approaches to rubber removal/surface restoration due to aircraft tire friction.
   - New or improved techniques for ice removal from runways.

B. Improved methods for foreign object detection and removal from runway surfaces.

C. Innovative approaches to address wildlife issues at airports including bird strikes.

D. Improved tug systems for aircraft.

E. Innovative applications, including web-based solutions, for airport operations and maintenance.

F. Improved methods for ground traffic flow scheduling.

G. Innovative ways to collect, verify, distribute or use geospatial data to benefit safety or efficiency impacting airport operations. Note: The FAA Office of Airports has developed an Airports GIS program to collect authoritative geospatial data for airport infrastructure and surveys. The NAV Lean Program has developed authoritative databases.
for sharing geospatial data for airports, obstacles, airspace and navigation aid.

H. Innovative solutions for accommodating new larger wingspan aircraft in airport operations, including, but not limited to, issues such as visual aids, gate access, taxiway and runway considerations, and language.

I. Improved approaches to baggage handling, including solutions to address human factors issues.

J. Approaches to addressing cybersecurity issues with respect to integrity of aircraft and airport systems.

K. New and improved techniques for communicating status and impact of service disruptions such as weather, equipment, accidents or other occurrences, flight delays, air traffic disturbances, and computer system breakdowns.

L. Operation and maintenance procedures to enhance sustainability and resilience at airports.

M. Strategies for safe and effective integration of automated and connected vehicles into the complex airport operations environment.

While students will need to undertake a thorough literature search, some key documents and resource links to begin the process are listed on the Competition website.

II. Runway Safety/Runway Incursions/Runway Excursions

The United States National Airspace System (NAS) has over 500 FAA/contract towered airports that handle more than 135,000 aircraft operations—takeoffs and landings—a day, averaging approximately 50 million airport operations per year. A runway incursion is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft. Of the approximately 150 million takeoffs and landings at United States towered airports from FY 2011 through FY 2013, there were 3,326 reported runway incursions. This performance record means that there were approximately 22 runway incursions for every one million operations and just under one serious runway incursion for every five million operations. The National Transportation Safety Board (NTSB) continues to list “Airport Surface Operations” on their Most Wanted List, which “is designed to increase awareness of, and support for, the most critical changes needed to reduce transportation accidents and save lives.”

One of the FAA's top priorities is to reduce the frequency of runway incursions and the risk of a runway collision. The FAA aims to reduce the severity, number, and rate of runway incursions by implementing a combination of technology, infrastructure, procedural and training interventions to decrease the prevalence of human errors and increase the error tolerance of airport surface movement operations.

The FAA is developing airport design concepts and surface movement procedures, such as the use of perimeter taxiways, to decrease the number of runway crossings and thereby reduce the risk of runway incursions. Related efforts address the errors committed by pilots, air traffic controllers, and airport-authorized vehicle operators and pedestrians.

Also of great concern are runway excursions. A runway excursion occurs when an aircraft departs the runway in use during the take-off or landing run or during taxiing. The excursion may be intentional or unintentional. Runway excursions are mainly of three types—overrun, undershoot and veer-off. Examples of runway excursions include: (1) a landing aircraft is unable to stop before the end of the designated runway is reached leading to a overrun; (2) an aircraft taking off or rejecting takeoff or landing departs the side of the designated runway leading to a veer-off; (3) an aircraft attempting a landing touches down in the undershoot area of the designated landing runway within the aerodrome perimeter; or (4) a runway or taxiway other than the designated one is used for a takeoff or a landing.

Runway excursions are the most frequent accident category worldwide. Between 2009 and 2013, there were 432 total commercial aviation accidents. Of these, 98 were runway/taxi excursions of which 7 involved a total of 191 passenger and crew fatalities (Source IATA). Studies of runway excursions have called for appropriate measures to be taken to address this problem.

Runway Safety/Runway Incursions/Runway Excursions Challenges:

A. Expanding situational awareness of pilots and ground operators on the airfield. Ideas include, but are not limited to:
   • Mobile tools for pilots, pedestrians and vehicle operators that aid in situational awareness.
   • Direct warning systems to alert pilots that they are approaching a runway and if the runway is occupied.
   • Direct warning systems to alert air traffic controllers for situations leading to runway incursion.
   • Direct warning systems to alert airfield drivers that they are approaching a runway they are not authorized to cross.
   • Development of innovative techniques to record, analyze and display annotated spatial data for improved situational awareness of ground operations.
• Methods for aircraft/runway interface that address issues caused by new energy efficient lighting not being visible to heat sensing, enhanced flight vision systems.

B. Enhancing airport visual aids
• Improved lighting, marking, and signage for runways, taxiways and the airport apron.
• Lighting other than traditional incandescent.
• Providing surface navigation guidance to pilots in the cockpit via electronic alternatives in limited visibility conditions (in lieu of outside visual cues).

C. Runway excursions
• Identification of major causal/contributory/contextual factors leading to runway excursions.
• Risk analysis of runway excursions due to overrun/undershoot/veer-offs.
• Innovative approaches to reducing runway excursions and associated risks.

D. Safety assessment tools
• Mobile tools to support assessments conducted by runway safety action teams that aid in compliance evaluation as well as hazard identification and correction.
• Systems analysis to determine areas of greatest risk for runway incursions and excursions in the National Airspace and proposing corrective action plans.
• Innovative processes to identify the hazards that present the greatest risk to air carrier operations within the runway environment and strategies to mitigate those hazards and improve safety of airport surface operations.

E. Optimizing safety through retrofit and redesign of existing runways and taxi ways.

F. Safety considerations for drones operating in or near the airport environment—issues and constraints as well as benefits and costs.

G. Innovative concepts for virtual/remote towers at non-towered airports.

H. Optimizing NextGen technology to improve runway safety in particular and airport safety in general.

I. Methods for improving runway safety during airport construction and reconstruction.

While students will need to undertake a thorough literature search, some key documents and resource links to begin the process are listed on the Competition website.

III. Airport Environmental Interactions

As the FAA carries out its mission, it must comply with regulations protecting the environment. All airport operations must be carried out with consideration for how the environment could be adversely affected. Airport environmental concerns may include many things: noise; land use; social impacts; air quality; endangered and threatened species; energy supply and natural resources; light emissions; solid waste impacts; or construction impacts.


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For the purpose of this Competition, the ACRP has chosen to focus on: making snow and ice removal more environmentally friendly, improved methods for containment and cleanup of fuel spills, storm water management, noise reduction, air quality around airports, and energy efficiency.

As mentioned in Section I, Airport Operation and Maintenance, one of the airport operator responsibilities is snow and ice control on paved surfaces. Air carriers/pilots must ensure their aircraft are free of ice/snow to enable a safe takeoff. In many cases, this involves application of a chemical agent, which for both aircraft and airport pavements must meet strict corrosivity requirements. After the aircraft is treated, the airport operator is left with the problem of how to dispose of these chemicals or other cleanup required. Any improvements in aircraft and/or pavement anti-icing and/or de-icing agents themselves, new methodologies or procedural improvement would be welcome.

Another environmental hazard is fuel spills. While a hazard on the airfield itself, airport operators must also ensure the spilled fuel does not enter the water supply where it can do even more damage. Storm water management at airports is important to prevent contaminants such as chemicals and fuels from entering the water table. Air quality around airports is also a factor.

Energy efficiency is another factor of environmental responsibility at airports. Energy is required for all airfield buildings, vehicles, and the airfield itself. It can be a challenge, especially at remote airports that may not have an independent power source, to keep the airfield properly lit.

This Design category has challenges that focus on improvements in snow and ice removal, containment and cleanup of fuel spills, storm water management, noise reduction and energy efficiency that will help airports carry out their mission in a way that will be environmentally sound and energy efficient.

Airport Environmental Interactions Challenges:

A. Making snow and ice removal more environmentally friendly. Both chemical and nonchemical options can be considered. The ACRP is seeking designs that offer:
- Improved means and methods of complying with aircraft and airfield anti- and de-icing requirements.
- Environmentally safe aircraft and airfield anti- and de-icing products that are compatible with both aircraft structures and airport pavements.
- Improved containment and cleanup of anti- and de-icing products.

B. Improving methods for containment and cleanup of fuel spills.
- Bioremediation techniques for fuel spill cleanup.
- Techniques/substances for neutralization of toxic components of fuel.
- Techniques/substances that delay the biological and chemical breakdown of fuel, allowing cleanup to occur without causing rapid decreases in dissolved oxygen in receiving waters that result from biological and chemical degrading of the fuel.
- Techniques for prevention of percolation of fuel into ground water.

C. Increasing energy efficiency in the management of airfields, the terminal area and other airport buildings. Topics that might be considered include:
- Alternative energy/energy efficient airport equipment such as tow vehicles, emergency generators, power units, heating systems, etc. for use in airfield areas.
- Alternate energy sources and approaches to providing lighting at remote airports that don't have access to electrical power.
- Innovative approaches to solid waste reduction at airports.
- Integration of alternative energy-producing and energy-saving technology into the airport environment.

D. New tools and approaches to storm water management methods, water use at airports, and dealing with negative impacts of standing water.

E. New tools and approaches to noise reduction at airports.

F. System level methodologies for strategic assessment of environmental interactions beginning at the airport planning phase.

G. Enhanced methods for improving air quality around airports.

H. Innovative strategies for management of natural environments to minimize negative impacts on, and to enhance compatibility with, Airport Operations.

I. Enhancing potential for resilience and sustainability of airport improvement projects in response to climate change effects or other naturally occurring catastrophic events.

While students will need to undertake a thorough literature search, some key documents and resource links to begin the process are listed on the Competition website.

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IV. Airport Management and Planning

In today’s airport environment, especially at the busier airports, any change in “normal” operations affects that particular airport and also may ripple across the NAS and affect many other airports and passengers. To meet this challenge, the FAA, airport operators, and airport users must work together to develop action plans that provide the best solutions for local and regional areas, as well as the nation. An integrated approach is preferred which includes improving technology, air traffic control procedures, and expanding airport and airfield infrastructure.

Airport Management and Planning Challenges:

This Design Category has challenges that focus on airfield management and planning that will help airport operators optimize the use of existing airport resources and plan for upcoming functional needs.

A Maximizing airport capability

- Strategies for accommodating aircraft that experience extended delays on the tarmac and in line for takeoff, including dealing with human needs as well as airport and airline capabilities.
- Innovative approaches to demand forecasting and management for airports.
- Innovative strategies for reducing airline fuel consumption, such as new ways to reduce gate-to-gate time or revise procedures.
- Effective alternatives to current ramp and gate controls.
- Creative approaches to airport revenue generation for general aviation airports.
- Models for collaborative decision making and data sharing at airports.
- Improved aircraft and airport design factors affecting aircraft compatibility to decrease the risk of aircraft wing tip collisions in the non-movement apron areas.
- Improved strategies for airport asset management, including land use.
- Innovations to accommodate the aging passenger demographic at airports.
- Effective uses of social media in airport planning, marketing, development and customer service.
- Planning for the integration and mitigation of possible impacts of drones into the airport environment.
- Enhanced management approaches to landside functions to include parking and ground transportation.

While students will need to undertake a thorough literature search, some key documents and resource links to begin the process are listed on the Competition website.

Important Note: Instructional videos on Completing a Safety Risk Assessment and Guidance for Preparing Benefit/Cost Analyses are available on the Competition website. It is strongly recommended that you use the guidelines presented in these videos as you prepare these elements of your design.

Photo Credits

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Guidelines for Design Submission

It is strongly recommended that participants review the Tips for Proposers section of the Competition website. Each of the following should be identified as a separate section of the design.

**Design Package Components:**

1. **Main Body of the Design Submission**
   The main body of the report must contain the following sections. There is a limit of 40 pages. Only required appendices are allowed. See format below.
   
   - Cover page to include: Title of Design; team member(s) name(s) and status (undergraduates or graduates); advisor(s) name(s) and university attending.
   - Executive Summary – 1 page.
   - Table of Contents with page numbers referenced for each section and appendix.
   - Problem Statement and Background on the Design Challenge being addressed. This section should demonstrate that the individual or team has a clear understanding of the issues surrounding the design challenge as well as current conditions and state-of-the-art approaches.
   - Summary of Literature Review. This is an overview of what was gleaned from the literature review with a discussion of primary sources and their influence on the design. Specific reference citations are to be provided in Appendix F.
   - Individual or Team's Problem Solving Approach to the Design Challenge. This section should include a thorough description of individual's or team's work including a description of both interdisciplinary and systems engineering approaches as appropriate to solving the problem.
   - Safety Risk Assessment: The FAA promotes a culture of safety throughout all its operations. Examine existing FAA safety management system guidance as it relates to your proposed design solution. Consider inherent risks and describe how these risks should be addressed to ensure safe operations. Be sure to reference Introduction to Safety Management Systems for Airport Operators (FAA Advisory Circular 150/5200-37) and FAA Safety Management System Manual available under the Resources section of the Competition website. See video with additional guidance on this section at the Competition website.
   - Description of how the technical aspects of the Design Challenge are addressed through drawings, mockups, computer codes, etc. as appropriate to provide evidence of a thorough design process.
   - Description of interactions with airport operators and industry experts in the design process. Be explicit. Identify contacts and interactions. This is a required Competition component.
   - Description of the projected impacts of the team's design and findings with a thorough discussion of how the design/solution meets ACRP goals. This section should address commercial potential for the design, including a description of processes that would need to be undertaken to bring the design to the product/implementation stage. Emphasis should be on increased affordability and utility. This section should provide a financial analysis that reflects a realistic approach to projected cost/benefit determination and for the team's design. Guidance for acceptable cost/benefit analyses for the purpose of the Competition is provided on the Competition website.
   - Appendices A-F as described below are required but not included in the 40-page limit. No other material may be included as an appendix.
     - Appendix A. List of complete contact information (use permanent addresses) for all advisors and team members. Include email, fax and phone numbers. This information is crucial as student participants may have graduated prior to receiving an award and all award checks are mailed directly to the participants.
     - Appendix B. Description (approximately one page) of the university or college.
     - Appendix C. Description of non-university partners involved in the project.
     - Appendix D. Sign-off form for faculty advisor(s) and department chair(s). Sign-off form is available at the Competition website.
     - Appendix E. Evaluation of the educational experience provided by the project. Evaluation questions for both student and faculty are provided on the Competition website.
     - Appendix F. Reference list with full citations using APA or other standard format. APA reference format is available at http://writing.wisc.edu/Handbook/Documentation.html.

**Format:**

Double-spaced, single-sided, minimum 12-point type, Times New Roman or Helvetica font. Captions and charts may be at a minimum of 10-point type. Pages, including appendices, must be numbered and referenced in Table of Contents.

**Due Date: April 29, 2019**

The design package shall be submitted electronically following guidelines provided at the Competition website. In addition, one hard copy of the full design plus the original sign-off form (available on Competition website) must be mailed to:

Virginia Space Grant Consortium  
600 Butler Farm Road, Suite 2253,  
Hampton, VA 23666.

All electronic and hard copy submissions must meet the 5 p.m. (Eastern Daylight Time) deadline on April 29, 2019. It is strongly recommended that a certified mail service be used. The faculty advisor will receive a submission acknowledgement via email.

By submission of the design package, Competition participants are agreeing that their design may be publicly shared.

vsgc.odu.edu/ACRPDesignCompetition
Awards and Key Dates

A cash award will be given to the student or shared equally among the student team members in each of the four technical design challenge areas as follows:

First Place - $3,000  
Second Place - $2,000  
Third Place - $1,000

First place award-winning team representatives will be invited to accept their award and present their design at a ceremony at the National Academies of Sciences, Engineering, and Medicine in summer 2019, date to be determined.

A travel allowance will be provided for at least two individuals (two students or one faculty advisor and one student) from each first place winning team.

First place teams will also be invited to present their design at an appropriate Competition partner workshop or conference. Travel costs will be covered.

- Competition announcement August 2018
- Notice of Intent (NOI) is strongly encouraged but not required. The NOI allows Competition staff to facilitate connections with airport operators and industry experts. Fall semester NOI deadline is September 28, 2018. Spring semester NOI deadline is January 28, 2019.
- Design submissions will be accepted from November 2, 2018 through April 29, 2019.

Note: Students may work on their designs at any time throughout the Competition period.

- Winners will be announced in June 2019.
- The Awards Ceremony with presentations by First Place winners will take place in summer 2019 and is anticipated to be in Washington, D.C.
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Monday, 9/17 in HCRS 1054
6:00PM Stanford Knight-Hennessy

Tuesday, 9/18 in HCRN 1143
6:00PM Goldwater and Astronaut Scholarships
6:45PM Rhodes, Marshall, Mitchell, Schwarzman, Churchill, and Gates Cambridge Scholarships

Wednesday, 9/19 in HCRS 1054
6:00PM Udall Scholarship
6:45PM Truman Scholarship

Thursday, 9/20 in HCRS 1054
6:00PM Beinecke Scholarship
6:45PM Scholarships to go abroad: Critical Language, Boren, Gilman, and Fulbright

Friday, 9/21 in HCRS 1076
8:30AM until 10:30AM Freshman Open House