



**SOUTH DAKOTA
STATE UNIVERSITY**

Meet the Grand Challenges: Undergraduates Embrace Land Grant Mission

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North American Colleges and Teachers of Agriculture
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OUR GRAND CHALLENGES

United States Department of Agriculture Higher Education Challenge Grants Program

- Climate Change
- Sustainable Energy
- Food Safety
- Hunger and Food Security
- Diabetes and Obesity

The '9 Billion people problem'



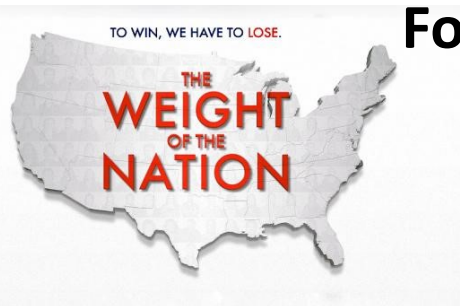
WHY Honors and the Grand Challenges?

- **Partnership between Honors, College of Agriculture and Biological Sciences, College of Education and Human Sciences, and SDSU Extension.**
- **Big, challenging, complicated issues**
 - Best and brightest minds
 - Multidisciplinary approaches
 - Problem solving, critical thinking
 - Ethical and human issues
 - Personal and professional implications
- **Embracing the Land Grant Mission**
 - Interdisciplinary Honors Courses
 - Undergraduate Research
 - Outreach & Engagement



Interdisciplinary Honors Courses

- All Honors students at SDSU were required to take Honors 383, Honors Colloquium, in order to graduate with Honors College distinction.
 - A multidisciplinary examination of a contemporary topic of interest emphasizing academic rigor, critical thinking, research, ethics and communications.
- A series of colloquium focused on the themes of the grand challenges were developed and delivered.



Food Safety: Farm to Table

Grand Challenges

Global Ecosystem

The Land

Energy

Food



HONORS COLLOQUIUM

Meeting the Grand Challenges

- Climate Change
- Sustainable Energy
- Food Safety
- Hunger and Food Security
- Diabetes and Obesity



- Key assessments
 - Quizzes
 - Book Panel Discussions
 - Interdisciplinary Case Studies
 - Leading Readings & Social Media
 - #honorsgrandchallenges
 - <https://twitter.com/search?q=%23honorsgrandchallenges&src=typd>
 - Personal Responsibility
 - Educational Outreach
 - Community Engagement
 - Brookings Backpack Project
 - Hunger Banquet
 - Serving Brookings Harvest Table
 - Feeding Brookings



Addressing Grand Challenges with Social Media



News Release to Engage Extension Audience

Kept conversation moving
outside the walls of the
university classroom!

Common hashtag
#honorsgrandchallenges

Addressing Grand Challenges Together

Posted Tuesday, September 15th, 2015 by [SDSU iGrow](#)

Categorized: [4-H & Youth](#), [South Dakota 4-H](#), [Healthy Families](#), [Foods & Nutrition](#), [Community Development](#), [Communities](#)

by Lura Roti for South Dakota State University College of Agriculture & Biological Sciences

BROOKINGS, S.D. - During the recent South Dakota State Fair, a family member tossed a half full plate of fair food into the trash. Samantha Sleep wasted no time. She pulled out her iPhone, snapped a photo, posted it to her twitter account and tagged it with #honorsgrandchallenges.

During the recent South Dakota State Fair, a family member tossed a half full plate of fair food into the trash. Samantha Sleep wasted no time. She pulled out her iPhone, snapped a photo, posted it to her twitter account and tagged it with #honorsgrandchallenges.

Documenting food waste isn't a hobby for this South Dakota State University nursing student. It's an assignment.

Sleep, 20, is among 24 honors students enrolled in the Grand Challenges class taught collaboratively by faculty and staff from SDSU Extension, Van D. and Barbara B. Fishback Honors College and College of Agriculture and Biological Sciences.

Food waste is among several topics Sleep and her peers study, discuss, Tweet about and debate during the semester-long honors colloquium which addresses topics of hunger, obesity, climate change, sustainable energy and food safety - all grand challenges identified by the U.S. Department of Agriculture.

"How, in a nation of plenty, do we still have hunger? There is no simple answer - these are all complex issues. There are many perspective and conflicting data on all these challenges," explains Barry Dunn, former South Dakota Corn Utilization Council Endowed Dean of the SDSU College of Agriculture and Biological Sciences and former SDSU Extension Director. "It's our job to provoke and challenge students' paradigms and belief systems. It's not about students being right or wrong; it's about these students using information that is as science-based and unbiased as possible to understand the world around them."

A junior with a hard-earned 3.96 GPA, Sleep says Grand Challenges is unlike any college course she has taken thus far. "This is the most intense class. It has challenged me to look at things from different angles than maybe how I've looked at them before. It has already made me step outside my comfort zone, my biases and opinions - to analyze the bigger picture," says the junior who grew up on a ranch near Spearfish.

Far from your typical class, students are assigned to conduct research on topics by reading contemporary books, journal and news articles they are encouraged to participate in discussions with experts and researchers who are invited to lead the class each week. In developing the plan for the course, Dunn and his co-instructors utilized education, research and SDSU Extension resources found within the state's Land Grant University.



Final Tweets!



Natalie Parks  @nmp025 · May 1

Perceptions can be limiting. Widen your perspective, gain understanding, better your life, better your world. [#honorsgrandchallenges](#)



Rawson Yost @yost_5 · May 2

[#honorsgrandchallenges](#) I learned that there are many sides of every issue, each justified in their thinking. Consider this before arguing!



Eric Stratman @stratman252 · 6h

Don't assume. Problems are where you least expect and it's our responsibility to find solutions that make an impact. [#honorsgrandchallenges](#)



Grand Challenges

Student Learning Outcomes Snapshot

After taking this course:

- Developing knowledge and understanding of diverse perspectives, global awareness, or other cultures 4.46
- Learning to apply course material (to improve thinking, problem solving, and decisions) 4.21
- Developing skill in expressing myself orally or in writing 4.0
- Learning to analyze and critically evaluate ideas, arguments, and points of view 3.96
- Learning to apply knowledge and skills to benefit others or serve the public good 4.21

Open-ended, qualitative responses were also very positive. 80 percent of students indicated the colloquium was 'an excellent course'.



Quotes from Students – Baseline - 2015

Future courses – Grand Challenges Part II – Innovative Solutions to G.C. – interdisciplinary teams come up with novel solutions that will impact the lives of x number of people within ten years. Feasible proposals could be submitted to state/regional business plan competitions. Bring in video conference of some of the most influential innovators to give talks to the class. And so many more ideas.

It would be a great idea to have more courses on these subjects. One could group food safety, food production and food security together and dive in more.

I would suggest reaching out and possibly implementing some of these solutions on campus. Food waste is one that could be tackled on campus.

The single major thing we can do is be aware. As I took this course I saw the lack of education and awareness, which is vague, but it is up to us to make these subjects transparent.

I loved this class and having the opportunity to truly dig and brainstorm about real life challenges. I learned a lot and was personally challenged!



Quotes from Students – Spring 2017

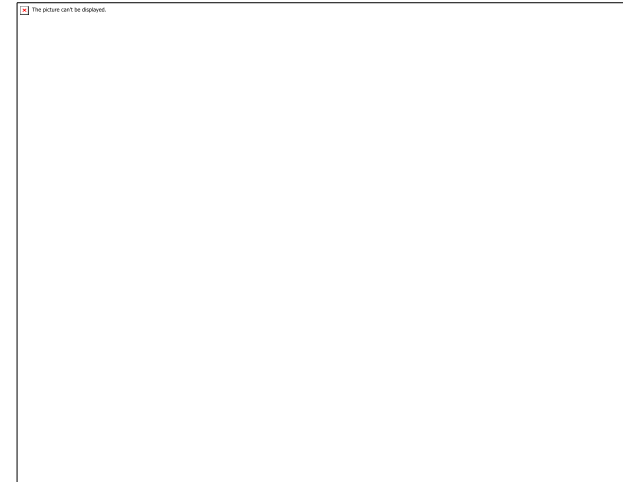
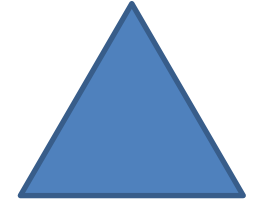
- **This was a good course. It explored good, interesting topics that are important to our society. I liked the speakers to hear different opinions. The assignments were challenging.**
- **I learned a lot more about global and national food issues that I never knew before, so it was definitely an eye opening class.**
- **The homework allowed me to go more in-depth into what we were learning. I particularly liked pairing with Feeding Brookings to see how everything we talked about in class relates to the community here in Brookings.**





FOOD SECURITY

- SNAP Challenge





OBESITY



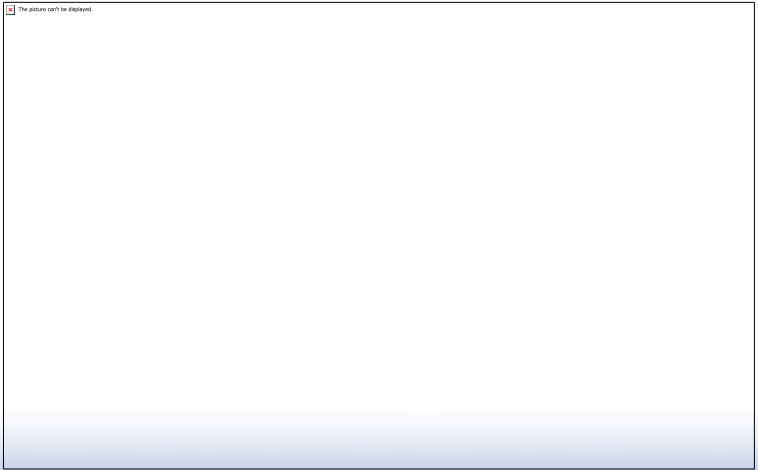
OFFICE SYNDROME

Why sitting is the new smoking.



Addressing barriers to healthy foods and physical activity

‘Making the Healthy Choice the Easy Choice’



UNDERGRADUATE RESEARCH

Meeting the Grand Challenges

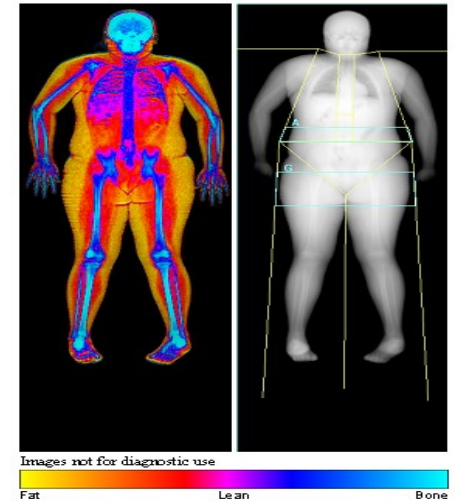
- **Call for proposals for projects to ‘meet the grand challenges’**
- **Students identified mentors and applied for research funding**
- **Review by faculty committee**
- **22 \$1000-2500 research stipends awarded over 3 years**
 - Wide range of projects ranging from education and nutrition to climate science, geographical information systems, molecular biology and sustainable energy
- **Paper and Presentations at Undergraduate Research, Scholarship and Creative Activity Day**



UNDERGRADUATE RESEARCH

Sample Student Projects

- SD Agriculture Education and the Grand Challenges
- Rural and Non-Rural Childhood Obesity
- Physical Activity in Rural Underserved SD Communities
- Mamas Against McDonalds
- Impact on Gut Microbiota and Metabolism of 2 Different Diets
- Factors Influencing Motility of Bull Semen
- Profitability and Yields of Alternate Oilseeds
- Flowability and Storage Properties of Soy-based Biomaterials
- Effects of Cooking Classes on Freshman Eating Behaviors
- Wellness Needs and Issues of First Year College Students



UNDERGRADUATE RESEARCH

Colleges and Programs

Van D. and Barbara B. Fishback Honors College
College of Agriculture and Biological Sciences
College of Education and Human Sciences

College of Arts and Sciences
College of Nursing

Jerome J. Lohr College of Engineering

Ag Communication, Ag Economics, Ag Education
Ag Engineering, Ag Leadership, Agronomy
Animal Science, Biochemistry, Biology
Computer Science, Dietetics, Electrical/Software Engineering
Exercise Science, Mechanical Engineering, Microbiology
Nursing, Veterinary & Biomedical Science

\$70,000 Awarded, 6 academic colleges engaged



COMMUNITY OUTREACH

Meeting the Grand Challenges



- **Youth Outreach Internships**
 - Partnership with Boys and Girls Clubs in Brookings, Flandreau, Yankton, and Lake Andes, SD.
 - Interns will work with Clubs to develop and deliver youth programs aimed at enhancing awareness and meeting the grand challenges.
 - Six Honors interns over 2 years

- **BOYS AND GIRLS CLUB MISSION –**
 - To inspire and enable all youth, especially those who need us most, to realize their full potential as productive, responsible, and caring citizens.
 - Programming built around priority outcomes:
 - Academic success
 - Character and leadership
 - Healthy lifestyles



COMMUNITY OUTREACH

Meeting the Grand Challenges



- **Yoga Club**

- 15 total participants
- New ways to be physically active
- Teamwork

- **Teen Cuisine**

- 42 total participants
- Basic kitchen skills, food safety
- Nutrition education
- Cultural experience

- **Gardening Club**

- 9 total participants
- Agriculture, tangible rewards
- Family activity

- **Healthy Lifestyles**

- Physical activities every hour
- Indoor and outdoor
- Snacks
- Suppers
- Dance parties

- **Challenges:**

- “Yoga is a girl thing”
- “I just want to eat the food”
- “My parents won’t garden at home”
- Continued participation and interest



COMMUNITY OUTREACH

Meeting the Grand Challenges

- **Student Impact–**
 - Real world experience
 - Nutrition education
 - Community Dietetics
 - Learning styles
 - Summer mindset
 - Diversified culture
 - Engrained a passion for education for all



MEETING THE GRAND CHALLENGES

Lessons Learned and Looking Ahead

- Ambitious, multi-faceted project is a grand challenge in itself 😊
- Range of opportunities for participation has led to broad support
- Transdisciplinary approaches = challenges and opportunities
- Assessment leveraged for program improvement
- Engagement and connection are critical
- **Looking ahead:**
 - Development of new courses
 - Undergraduate research & youth outreach internship evaluations
 - Awarding grand challenge scholar designation
 - Overall program assessment





*“If we have both
consciousness and
choice,
then we also have
responsibility;
including the
responsibility to try
to understand!”*

Paraphrased from
“All the Little Live Things”
by Wallace Stegner





**SOUTH DAKOTA
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THANK YOU



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“Meeting the Grand Challenges” Proposal Number: 2014-04615