



FAMU-FSU
College of Engineering




ECE Senior Design Course 2012-2013

EEL 4911C
Senior Design Project I
Fall Semester, 2012-13
Instructor: Dr. Michael Frank


v1.0
8/30/2012

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List of This Year's ECE-Staffed Senior Design Projects

#	Name	Led by	Includes	Notes
1	SoutheastCon Robotics	ECE _(ME)	ME	Competition
2	Solar Car	ECE	ME	Competition?
3	RoboSub AUV (?)	ME	ECE	Competition
4	Cosmic Ray Detector	ECE	ME	Sponsored research
5	Marine Drifters	ECE		External customer
6	Oil Spill Detector	ECE	ME	External customer
7	Turfgrass Impact Tester	ECE		External customer
8	NASA Lunabot	ME	ECE	Competition
9	FIPSE-1/Drone (Brazil)	ME	ECE	International
10	CanSat (small satellite)	ME	ECE	Competition

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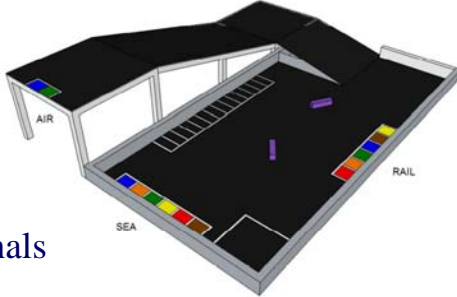
IEEE SoutheastCon 2013



Project #1 (of 10) **Student Hardware Competition**

- ☐ Autonomous robots
 - Move “cargo” blocks to “terminal” locs.
- ☐ Local competition
 - 6 teams (1 ME-led)
 - Winner goes to regionals
- ☐ Rules, FAQ & link to Facebook group
 - <http://ta.gd/SEcon13>

Project Advisor: Dr. Harvey



(4-5 students per team -
2 multidisciplinary teams
w. 2 ECE, 2 ME)

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SoutheastCon 2012: FAMU-FSU Victorious!



School Name	Team Name	Qualified	Run 1	Run 2	Run 3	Average	Final
FAMU-FSU College of Engineering	i-GAR	Yes	560	560	550	556	550
University of Alabama at Birmingham	57494E4E494E47	Yes	330	150	270	250	480
University of South Alabama		Yes	300	270	250	273	420
Anhnam University	Anhnam SPARC	Yes	150	350	320	273	380
University of West Florida			280	210	233		380
University of Alabama			400	350	323		360
Mississippi State University			10	340	316		320
DeVry University - Orlando			80	240	233		200
Western Carolina University			10	210	180		
Murray State University			80	130	173		
University of North Carolina at Charlotte			0	220	150		
University of Tennessee			0	90	146		
Pellissippi State Community College							
UNC Asheville							
Virginia Military Institute							
University of Florida							
University of the West Indies Mona							
Florida Institute of Technology							
Western Kentucky University							
University of Tennessee at Martin							
University of North Florida							
University of Louisville							
University of Alabama in Huntsville							
University of South Florida							
University of Memphis							
Georgia Southern University	Eagle Robotics	Yes					
Christian Brothers University	CBU Robotics	Yes					
North Carolina A&T State University School of Technology	AggieBot	Yes					
Bethune-Cookman University		Yes					
Clemson University		Yes					
University of Kentucky		Yes					
Tennessee Technological University	TTU-Eagle	Yes					
Embry-Riddle Aeronautical University	Eagles	Yes	100	110	90	100	
Virginia Tech		Yes	100	100	100	100	
University of Evansville	BUUE	Yes	110	100	90	100	
Savannah Technical College		Yes	90	90	120	100	





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Project advisor: Dr. Zheng / Dr. Foo (ME advisor TBD)





Project #2 (of 10)

Solar Car

(4 ECE, 2 ME)


- ☐ Continuing project
 - 4th consecutive year
 - Eventually enter into American Solar Challenge, or Shell Eco-Marathon?
- ☐ Vehicle worked last year
 - Batteries now bad though
- ☐ Some possible upgrades for this year:
 - Replace batteries, more efficient motor & solar cells, add fuel-cell energy storage?
- ☐ Major funding will likely be needed
 - Sponsorship inquiries pending (FREEDM, Shell, etc.)
 - Students should continue helping to seek outside funding

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Project Advisors: Dr. Harvey, M. Greenleaf (& ME tbd)


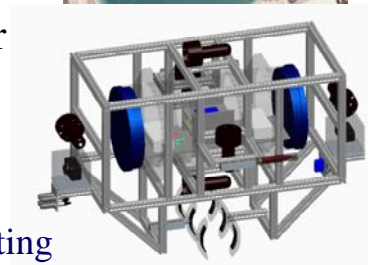


Project #3 (of 10)

RoboSub (AUV)

(3 ECE, 3 ME?)


- ☐ Continuing project
 - This is year 3
- ☐ AUVSI int'l competition
 - <http://ta.gd/robosub>
- ☐ Almost completed last year
 - Reuse some parts this year
- ☐ Redesign work this year
 - A few new components
 - Extensive programming/testing

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Project
#4 (of 10)

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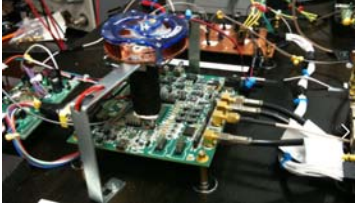

Project Advisors: Dr. O'Neal (FAMU Physics), Dr. Frank

Cosmic Cube

(3 ECE, 2 ME)




- ❑ Follow-on to previous year's "COSMICi" project
 - Cosmic ray detector system
- ❑ Goal: Build a distributed network of low-cost particle detectors for cosmic-ray astronomy
 - This year: Compact, desktop-scale unit
- ❑ Detector electronics prototyped last yr.
 - Major new work needed in: Detector materials, photocells, system redesign.

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Project
#5 (of 10)

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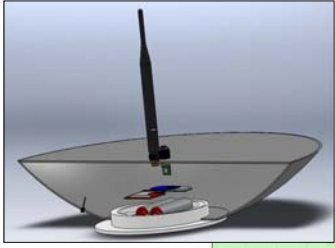

Project Advisors: Dr. Frank, Dr. Kevin Speer & others TBD

Marine Drifters

(4 ECE)



- ❑ Sponsored by FSU Oceanography dept.
 - Continuation from last year's project
- ❑ Autonomous data-collection platform
 - GPS location, temperature data
 - Ad-hoc radio network
- ❑ Prototype partially completed last year
 - This year:
 - ❑ Much more programming/testing, design-for-manufacturing, possible reselection of MCU system

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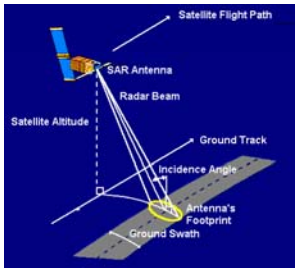
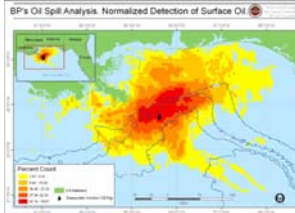
Advisors: Oscar Garcia (Oceanography),
B. Harvey / M. Frank (ECE)

Proj. #6
(of 10)

Radar System for Oil Spill Detection

- ☐ Sponsored by FSU Oceanography dept.
 - New project this year
- ☐ Satellites are used for synthetic-aperture-radar (SAR) detection of spills
 - Goal: Develop a portable radar system for up-close, detailed analysis of spills

(2 EE,
2 CpE,
2 ME?)

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Project Advisors: Dr. Frank (ECE), John Mascaro (Turf-Tec)

Project #7
(of 10)

Turf Grass Test Equipment

(6 ECE)

- ☐ Sponsored by: **Turf-Tec International**
 - Locally-based manufacturer & reseller
 - Ongoing project: this is Year 2
- ☐ Finish development of a turf-grass hardness impact tester
 - (with GPS datalogger)
 - Prototype designed last year →
 - Design-for-manufacturing needed
- ☐ Also: Develop a new product:
 - Soil Moisture Meter
 - Time-domain reflectometry


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Project
#8 (of 10)

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Advisor: Dr. ?? (ME)

NASA Lunabotics Miner



2 ECE,
? ME


- ❑ Lunar regolith mining robot competition
 - Details at:
<http://ta.gd/lunabot>
- ❑ Kennedy Space Center
- ❑ Continuing project
 - Last year's team constructed a partially working excavator




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Project
#9 (of 10)

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Advisor: Dr. ?? (ME)

FIPSE-1/Drone (Brazil)



2 ECE,
? ME

- ❑ Under U.S.-Brazil Student Exchange Program
 - Sustainable Energy & Aeronautical Engineering
 - ❑ <http://www.eng.fsu.edu/FIPSE-SEAEP/>
 - AUVSI 2012 Student UAS (Drone) Competition
 - ❑ <http://ta.gd/AUVSI-UAS12>
- ❑ Participating ECE students are already with the program in Brazil
 - Not available for additional students this year

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Advisor: Dr. ?? (ME)



Project
#10 (of 10)

CanSat – Small Satellite

2 ECE,
? ME

- ☐ Design/Build/Launch student competition
 - “Rockets will be provided”
- ☐ Launch from Texas in June
- ☐ See last year’s webpage at
<http://www.cansatcompetition.com/Main.html>





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