



Dwight Look College of
ENGINEERING
TEXAS A&M UNIVERSITY

Department of Ocean Engineering

Two Campuses- One Department



College Station, TX



Galveston, TX



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OCEAN ENGINEERING
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Department Vision and Objectives

To establish a world-class Ocean Engineering program

1. **Pioneer** in modern ***ocean engineering*** curriculum
2. **Innovator** of education techniques – multi-campus instruction
3. **Leader** *in ground-breaking research areas*

- Define the field of **modern** ocean engineering
 - Science, Engineering, Exploration
- Embrace multi-disciplinary nature of field
- Scholarly excellence and industrial impact

Stake-holders

- (i) State of Texas – coastal infrastructure
- (ii) Houston-based off-shore and shipping industry
- (iii) GOM resource utilization



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Mission

- ***Undergraduate:*** Prepare the students for a career in any/all aspects of Ocean Engineering
- ***Graduate:*** Lead in research of new/novel aspects of Ocean Engineering

Prepare future generations to utilize all ocean resources and yet live in harmony with it



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Tenets of TAMU OCEN

- To develop a world-class program to meet the future Ocean Engineering needs
- Strong/broad undergraduate curriculum to prepare students for all OE needs
- Focused research areas leveraging location and faculty talents
- Top-notch graduate program in focus areas



Areas of engagement

Undergraduate curriculum will continue to serve the state's off-shore industry and coastal engineering needs, while expanding coverage on other areas of profitable employment in related fields.

Research and graduate curriculum must be broader and more forward-thinking

- Coastal systems and Infrastructure - Science and Engineering
- Ocean Resource Utilization – Science and Engineering

**TAMU has strategic location,
economical clout,
and intellectual firepower**

**To lead the world in
Ocean Engineering**



Growth Projections

Year	2016	2020
B.S.	240	400
Graduating seniors	50	100
M.S. Ph.D M. Eng (OCEN) M.Eng (Sub-Sea)	??	50 (some supported) 50 (mostly supported) 50+ (unsupported) ??
TT Faculty(OCEN)	~8	16
NTT Faculty (OCEN)	3	6
NTT (EASA)	3	5
NTT (Sub-Sea)	3	5



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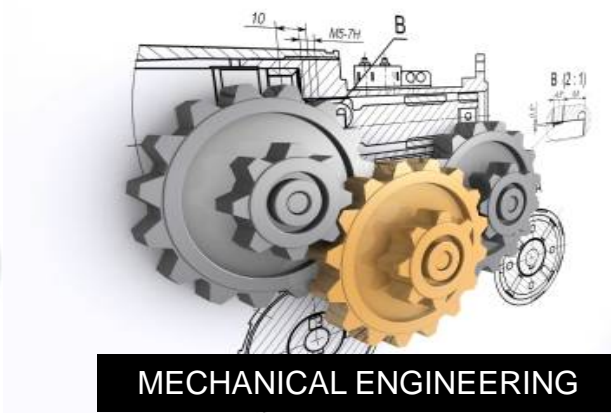
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Research Focus Areas

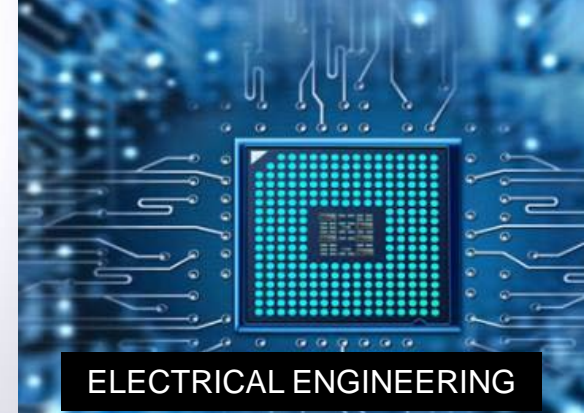
- Coastal Science/Engineering:
 - Coastal infrastructure resiliency
 - Coastal Hazards Prediction, Risk-Assessment
- Off-shore resource utilization
 - Advanced simulation/experiments
 - Off-shore infrastructure
- Ocean robotics, communication and automation (ORCA)
 - Energy-Drone nexus
 - Exploration including marine archaeology
- Materials in extreme ocean conditions
- Renewable Energy



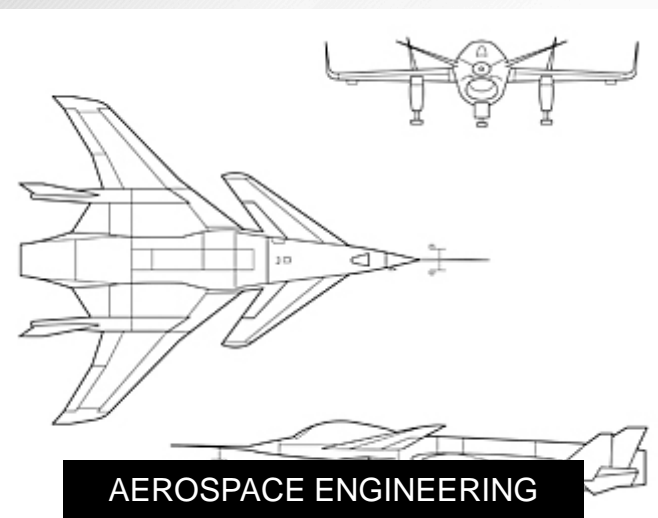
CIVIL ENGINEERING



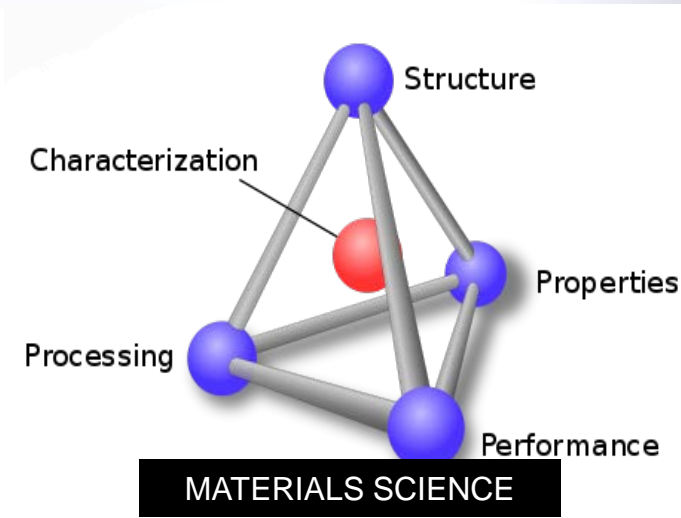
MECHANICAL ENGINEERING



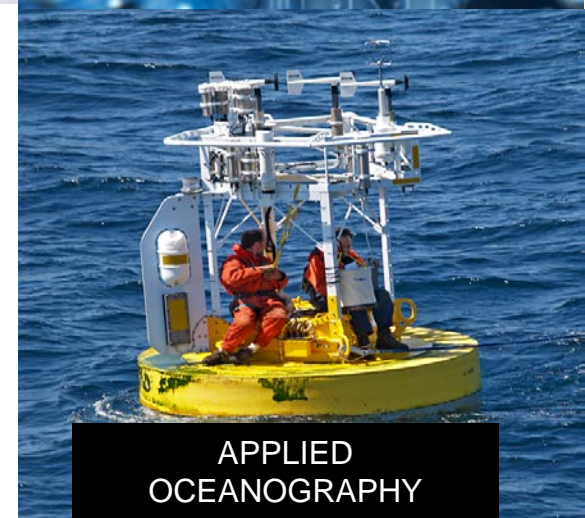
ELECTRICAL ENGINEERING



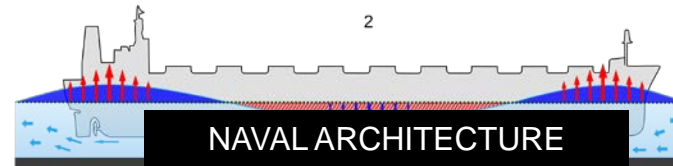
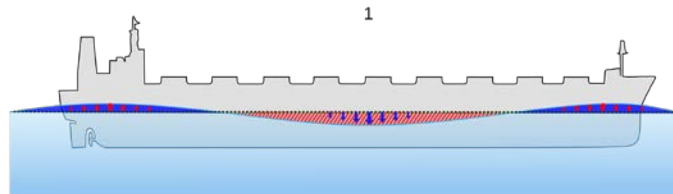
AEROSPACE ENGINEERING



MATERIALS SCIENCE



APPLIED OCEANOGRAPHY



NAVAL ARCHITECTURE



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Coastal Infrastructure, Hazards Prediction, Risk-Assessment

Science: Geoscience, Fluid dynamics, Transport, Meteorology, Big-data

Partnership : US Army Core of Engineers (CRADA)

Strengths: Storm/tsunami effect on infrastructure, delta/barrier islands, intracoastal waterway

Personnel: Figlus, Horrillo, Rodriguez-Iturbe, Perlin, Feagin, **Vinent**

Other Departments: CVEN, Ecology & Management, TAMUG

Current Sponsors: NOAA, USACE, Port Authorities, Local/State Govt

Goal: Digital Gulf Center Big data → Modeling → Prediction → Policy



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Ocean Robotics, Communication and Automation (ORCA)

Science: AUVs, ROVs, deep-ocean automation, un-personned ships

Partnership : NTNU (Norway), Univ. Porto (Portugal), Deep Down Inc.

Goal: Integrated Air, Surface, Underwater autonomous systems for off-shore operations

Personnel: Skelton, Darba, Srikanth and **new hires**

Other Departments: MEEN, ELEN, CPSC, Marine Archeology (COLA)

Current Status: Off-Shore industry recently launched Energy-Drone coalition Symposium, but lack academic backbone

Goal: National Center for `Drone-Energy Nexus' – Integrated ASU Network serving Off-shore Industry



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Ocean Systems Simulations Lab & Field experiments

Unique opportunity to combine

- State of the art computer simulation capability
- OTRC experimental capability
- Wind tunnels of Aerospace department