

# Challenges in Establishing an Undergraduate Degree Program in Hydrographic Science

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# The Need for Practical Hydrographic Education in the USA

Commercial Survey companies\* have indicated a very high interest in a U.S. Undergraduate degree Program because:

- Few academic programs exist in the USA
- USM and UNH do not address industry needs for more hydrographers with a practical hydrographic skill set.
- Many new hires have land survey skills only
- Only source of ready- to- work entry-level employees are foreign (Canadian, UK, etc.)
- U.S. regulatory agencies are becoming more restrictive in applying the Jones Act and HB-1 visas.

\* (persons with C&C Technologies, Fugro-Chance, and DOF Subsea)

# US Companies Dependent on Foreign Trained Hydrographers May Be in Jeopardy



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**INDIA REAL TIME**

## H-1B Visas: How Donald Trump Could Change America's Skilled Worker Visa Rules

Indian outsourcing firms are watching closely to see what moves Mr. Trump makes on immigration



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President Donald Trump signs an executive order in the Oval Office of the White House in Washington, DC, January 23, 2017. PHOTO: SAUL LOEB/AGENCE FRANCE-PRESSE/GETTY IMAGES

By **NEWLEY PURNELL**  
Jan 24, 2017 4:27 pm IST

**20 COMMENTS**

During his campaign, President Donald Trump assailed a skilled-worker visa program used to send foreigners to the U.S., and in his inaugural speech Friday he said the country would "follow two simple rules; buy American and hire American."

## Challenges in Establishing an Undergraduate Degree Program in Hydrographic Science

- ❑ “Do I get to swim with the dolphins? Hydrography what’s that?”

**We Visit high schools and career fairs to discuss hydrography.**

- ❑ “I hate math.” In fact studies show Americans stink at math.

**USM provides remedial courses in algebra and trigonometry.**

- ❑ “I can’t afford full-time college.”

**USM: ACT Scores 21+ receive financial aid, 30+ free tuition.**

**DoD: SMART – full tuition and \$25k stipend for STEM**

**THSOA: Scholarships**

**Seeking industry scholarships and intern positions.**

- ❑ Declining state support to higher education.

**Obtained Office of Naval Research (ONR) funds for startup.**

- ❑ Few qualified faculty.

**Seeking to fill five positions.**

(Continued on back)

commenced this new STEM program that is presently available nowhere else in the U.S. Information for the B.S. Marine Science (Hydrography) specialty program includes the following:

- 124-126 credit hour, four-year university degree program

## Working out doors

- International Marine Contractor Association (IMCA) Offshore Surveyor standards to be met
- Prerequisites for advanced degrees to be met



## STUDENT DIVERSITY

Our students come from all over the United States and the world, from the military or government service, just out of school, or as experienced surveyors. They learn how to drive a small boat; receive hands-on training in hydrographic equipment and software; to collect, analyze and manage large data sets; and to receive in-depth knowledge of advanced concepts in 3D positioning and sonar portrayals of the ocean floor.



Working with high tech equipment



Working with a team of professionals



Ocean Science is not just about swimming with dolphins



THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Division of Marine Science

## HYDROGRAPHY

*Follow in the footsteps of the great explorers to the far reaches of the planet!*

- Want to work outdoors on the water, using knowledge of ocean science and newly acquired skills in hydrographic surveying?
- Would you enjoy working with a team of professionals working to make a difference for safety of life at sea?

### For more information:

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### Find us on Facebook:

Southern Miss Department of Marine Science

[www.usm.edu/marine](http://www.usm.edu/marine)

Working on the water



THE UNIVERSITY OF SOUTHERN MISSISSIPPI

School of Ocean Science and Technology  
ne Science

oulevard  
Center, MS 39529-9904



*Then hydrography is the career for you!*

## WHAT IS HYDROGRAPHY?

As a natural source of raw materials, such as fuel and food, the seas and oceans of the world have never been so important. The oceans are a very fragile environment whose exploitation must be carefully and considerably managed. It is the work of the hydrographer to chart this great frontier and to provide the expertise for their exploration and for much of the engineering needed for their development. Traditionally, the hydrographer has been associated with making the nautical charts that allow ships to navigate the world in safety. This is still an important role, but as a science and profession, hydrographic surveying has evolved into an exciting, multi-disciplinary and well-paying occupation. The hydrographer is involved with every aspect of the collection, analyses and management of oceanographic data that has applications for

- Safety of navigation from inland coastal waters to the depths of the ocean trenches;
- Exploration for oil and gas;

- Engineering, construction or maintenance of ports, waterways, trans-oceanic cables and offshore windfarms;
- Coastal management and inundation studies;
- Delineation of maritime boundaries;
- Underwater archeology;
- Habitat mapping; and
- Naval warfare.

## B.S. MARINE SCIENCE (HYDROGRAPHY) DEGREE PROGRAM

This new undergraduate program offers a B.S. in marine science with a hydrographic science emphasis, available at the Gulf Park campus in Long Beach, Miss. This campus is near the Naval Oceanographic

### SPECIFIC DEGREE PROGRAM REQUIREMENTS

#### General Education Courses

English Composition 101 .....	3
English Composition 102 .....	3
World Literature .....	3
Humanities Elective .....	3
Humanities Elective .....	3
Aesthetic Values Elective .....	3
Social and Behavioral Science Elective .....	3
Social and Behavioral Science Elective .....	3
<b>Subtotal</b> .....	<b>24</b>

#### Prerequisite Courses for Marine Science

Principles of Biological Sciences 1/ Lab .....	3/1
Principles of Biological Sciences 2/ Lab .....	3/1
General Chemistry 1/ Lab .....	3/1
General Chemistry 2/ Lab .....	3/1
Physical Geology/ Lab .....	3/1
General Physics 1/ Lab .....	3/1

General Physics 2/ Lab .....	3/1
Calculus 1 with Analytic Geometry .....	3
Calculus 2 with Analytic Geometry .....	3
<b>Subtotal</b> .....	<b>34</b>

#### Prerequisite Courses for Hydrography

Specialization	
Linear Algebra .....	3
Weather and Climate w/ Lab .....	3/1
<b>Subtotal</b> .....	<b>7</b>

#### Marine Science Degree Courses

The Oceans .....	3
Marine Science 1: Oceanography w/ Lab .....	3/2
Marine Science 2: Marine Biology w/ Lab .....	3/2
Field Methods in Marine Science .....	3
Management of Oceanographic Data .....	3
Marine GIS .....	3
Ocean Policy and Management .....	3
Ocean Acoustics w/ Lab .....	3/1

Safety of Navigation

Exploration for oil and gas

Offshore engineering construction

Coastal management

Office, Naval Research Laboratory-Stennis, Naval Con-

Delineation of maritime boundaries

of oceanographic scientists in the world, a vibrant Blue Economy in the Gulf Coast region, and exciting opportunities

Underwater archeology

Habitat mapping

#### Hydrography Specialization Required Courses



3-D Positioning .....	3
Elect	
Naut	
Rem	
Field	
Hydr	
Hydrographic Data Analysis .....	2
Offshore Construction Hydrography .....	3
Marine Science Seminar (Law for Hydrographers) .....	1
Marine Science Seminar (Legacy Hydrography) .....	1
Hydrographic Capstone .....	2
<b>Subtotal</b> .....	<b>27</b>

**Degree Total Credits**..... 124

## U.S. 38th out of 71 countries in math and 24th in science

We do what we can to repair  
the damage done in high  
school with remedial courses

From PEW Research Center (Feb. 15,  
2017) “U.S. students’ academic  
achievement still lags that of their  
peers in many other countries”

Math education in U.S.  

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### Math education in the U.S.: What we're doing wrong. - Slate

[www.slate.com/blogs/.../math\\_education\\_in\\_the\\_u\\_s\\_what\\_we\\_re\\_doing\\_wrong.html](http://www.slate.com/blogs/.../math_education_in_the_u_s_what_we_re_doing_wrong.html) ▾

Feb 25, 2014 - It is also geographically diverse: Whatever problems exist in **math education** in the U.S. are very different from those in India, Mexico, ...

### Why Math Education in the U.S. Doesn't Add Up - Scientific American

<https://www.scientificamerican.com/.../why-math-education-in-the-u-s-doesn-t-add-up...> ▾

Nov 1, 2016 - Research shows that an emphasis on memorization, rote procedures and speed impairs learning and achievement.

### Mathematics education in the United States - Wikipedia

[https://en.wikipedia.org/wiki/Mathematics\\_education\\_in\\_the\\_United\\_States](https://en.wikipedia.org/wiki/Mathematics_education_in_the_United_States) ▾

From kindergarten through high school, the **mathematics education** in public schools in the **United States** has historically varied widely from state to state, and ...

### <sup>[PDF]</sup> Mathematics Education in the United States - National Council of ...

[www.nctm.org/uploadedFiles/About/MathEdInUS2016.pdf](http://www.nctm.org/uploadedFiles/About/MathEdInUS2016.pdf) ▾

Jul 24, 2016 - **United States**. National Commission on **Mathematics Instruction**. Title: **Mathematics education in the United States 2016** : a capsule summary.

### U.S. math education is broken - The Hechinger Report

[hechingerreport.org/u-s-math-education-is-broken/](http://hechingerreport.org/u-s-math-education-is-broken/) ▾

**U.S. math education** is broken. by Hechinger Report. April 1, 2010. If the **United States** is going to remain economically competitive and a leader in new ...

### Why Do Americans Stink at Math? - The New York Times

[www.nytimes.com/2014/07/27/magazine/why-do-americans-stink-at-math.html](http://www.nytimes.com/2014/07/27/magazine/why-do-americans-stink-at-math.html) ▾

Jul 23, 2014 - The Common Core should finally improve **math education**. ... from reformers in the **United States**, and he dedicated himself to learning to teach ...

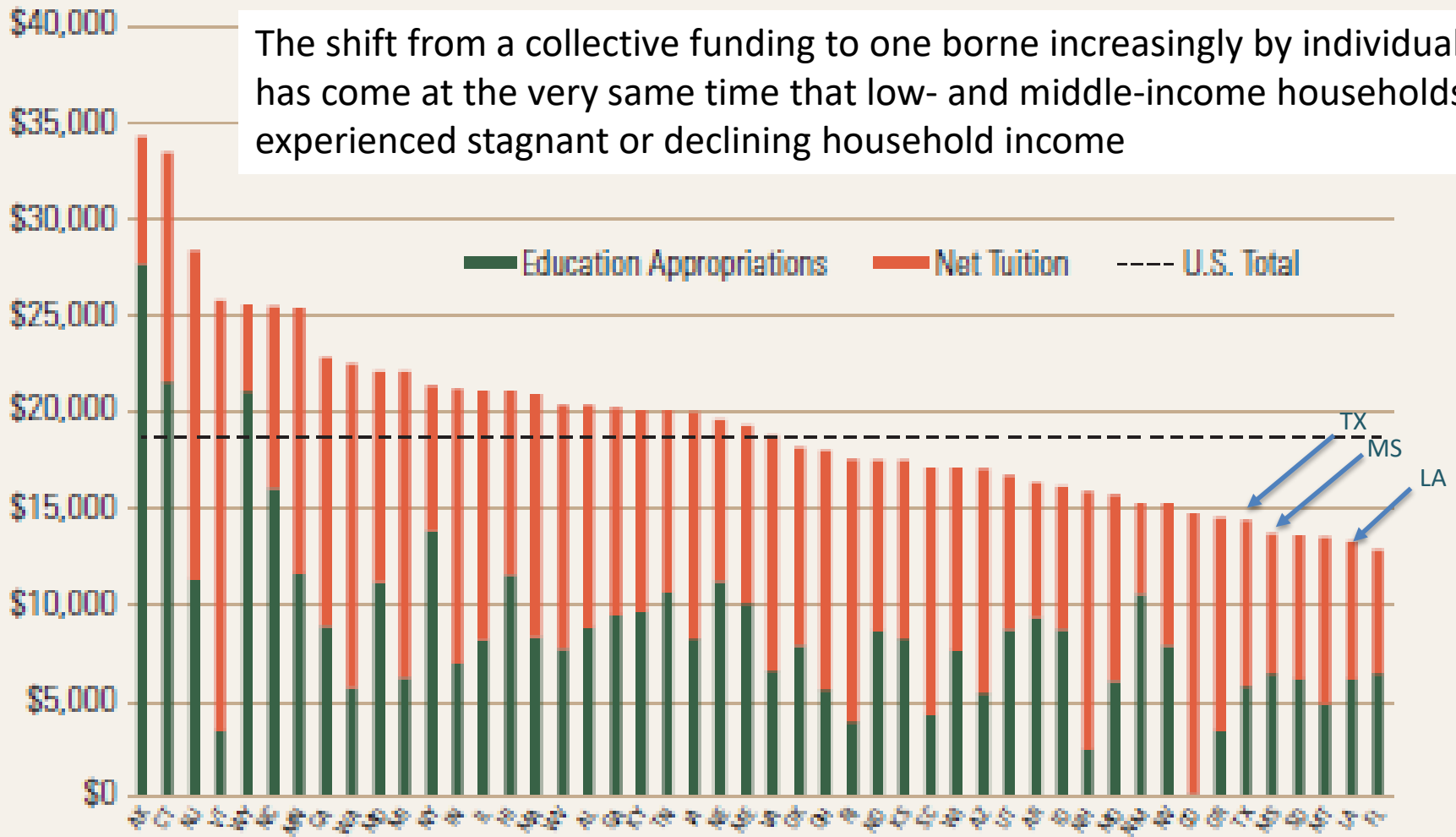
### 1 Comparisons Between Mathematics Education in China and the ...

<https://www.nap.edu/read/12874/chapter/2> ▾

Liping Ma began the workshop with a general comparison of **mathematics education** in China and the **United States**. Ma taught elementary school for 7 years in ...

# Figure 11: Education Appropriations and Net Tuition at Public Research Universities per Full-Time Equivalent Student, 2013

The shift from a collective funding to one borne increasingly by individuals has come at the very same time that low- and middle-income households experienced stagnant or declining household income



States vary in their reliance on appropriations and net tuition. Source: State Higher Education Executive Officers (SHEED) Association, *SHEF: FY 2014—State Higher Education Finance* (Boulder, Colo.: State Higher Education Executive Officers Association, 2015).

*The Great Cost Shift Continues*  
*State Higher Education Funding After the Recession*  
 by Robert Hiltonsmith & Tamara Draut

American Academy of Arts & Sciences (2015)  
 Public research Universities  
 Change in State Funding



# Help Me Get the Word out on Scholarships

## EDUCATION



### SCHOLARSHIPS

The Hydrographic Society of America (THSOA) encourages college/university students to consider a career in hydrographic surveying. THSOA and its chapters provide several student scholarships in order to assist students with academic costs.

Without the help of our officers, volunteers, members and event sponsors we would not be able to provide these scholarships and we thank you for your generosity. If you have any scholarship questions or concerns please contact the [administrative assistant](#).

#### National Scholarship

The National THSOA scholarships are available to full-time student seeking a 2-year, 4-year, or graduate degree in Hydrographic Surveying, Ocean Mapping, Geomatics, Ocean Sciences, Geographic Information System (GIS), Ocean Engineering, Electrical Engineering, or other related field.

At least five scholarships will be awarded this year. The scholarship deadline for the 2016 - 2017 academic year school is November 15, 2016. The National scholarship criteria and application can be downloaded at the link below:

 [- 2016 - 2017 THSOA National Scholarship Application](#)

#### Houston Chapter Scholarship

The Houston Chapter of THSOA scholarships are available to full-time first-year, second-year or later students who are currently enrolled in a Hydrographic and/or Geophysical Survey, Geomatic/Geodetic Engineering, Ocean Sciences, Survey or Systems Engineering, Electronics, Software Development, or Geographic Information Sciences (GIS) and that can demonstrate an interest in marine or offshore survey, mapping or survey and positioning in-line with the above subjects. Applicant must be a current resident of Texas or plan on attending a college in Texas.

At least two scholarships will be awarded this year. The scholarship deadline for the 2015 - 2016 academic school year is October 31, 2015. The Houston Chapter scholarship criteria and application can be downloaded at the link below:

 [- 2015 - 2016 THSOA Houston Chapter Scholarship Application](#)

#### Southeast Chapter Scholarship

The Southeast Chapter of THSOA scholarships are available to full-time students seeking a 2-year, 4-year, or graduate degree in Hydrographic Surveying, Ocean Mapping, Geomatics, Ocean Sciences, Geographic Information System (GIS), Ocean Engineering, Electrical Engineering, or other related field. Applicants be a current resident of Louisiana, Mississippi, Alabama or Florida or plan on attending a college in those states.

At least four scholarships will be awarded this year. The scholarship deadline for the 2016 - 2017 academic year school is November 30, 2016. For more information or to request a scholarship application, please email: [southeast@thsoa.org](mailto:southeast@thsoa.org).

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## More Industry Support is needed

# 5 Hydro Faculty Positions Open

1 – Tenure Track Assistant or Associate Professor

1 - Instructor

3 – Researchers

Also seeking adjunct instructors

For more information go to <https://jobs.USM.edu>

## USM's B.S Marine Science (Hydrography) specialty – Fall 2015

- 124 – 126 credit hour 4-year university degree program.
- Include 9 new courses in Hydrographic Science.
- Category B Recognition to be requested from the International Board (IB) in 2017.
- IMCA Offshore Surveyor standards to be met.
- Pre-requisites for advanced degrees to be met.
- Graduating its 1st Hydro class in Spring 2018.



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Questions