SD1 JUNIOR CLASS SMALL VESSEL DESIGN PROJECT

Professor: Bradley D. M. Golden '99
Assistant Professor of Naval Architecture

As a part of Professor Bradley D.M. Golden's '99 Ship Design 1 (SD1) class, the juniors spent the first two-and-a-half months of the spring semester preparing their first complete concept designs.

Using the knowledge they've gained in their nearly three years studying at Webb and the experiences from their winter work periods to date, this was the students' first opportunity to apply the naval architecture and marine engineering principles they've studied including stability, ship's structures, main machinery systems, auxiliary systems, resistance and propulsion, and electrical engineering.

Working in small groups of three and four, the students selected one of the vessel types and took their first couple of spins around the design spiral to prepare vessel concept designs. To help make the project as realistic as possible, members of industry familiar with each of the vessel types helped prepare the statements of design requirements that each of the designs had to meet. To challenge the students even further, one or two "curveballs" were thrown into each design statement to make the students think long and hard about how they would achieve their objectives.

At the end of the spring semester, the students presented their final designs to their fellow students, faculty, and members of industry who served as part of an evaluation team. After three years at Webb, the Junior class can now say with confidence that they're familiar with the design process and are well on their way to joining the fields of naval architecture and marine engineering.

UNDERGRADUATE CURRICULUM MATRIX

FRESHMAN		SOPHOMORE	
FALL	**SPRING**	**FALL**	**SPRING**
Math I Calculus I	Math II Calculus II	Math III Differential Equations	Math IV Adv. Engnr. Math
Technical Communica-tion	Political Philosophy	Western Culture I	Western Culture II
Chemistry	Materials Science	Strength of Materials	Dynamics
Physics I	Physics II	CAD	Physics III
Programming & Applications	Statics	Thermody-namics	Fluid Mechanics
Intro. to Naval Architecture (NA I)	Science Lab	Ship Statics (NA II)	
	Intro. to Mar. Engineering Syst.(ME I)	Mar. Eng. System Components (ME II)	Mar. Eng. Machinery Desig. (ME III)

JUNIOR		SENIOR	
FALL	**SPRING**	**FALL**	**SPRING**
Probability/ Statistics	Thesis	Thesis	Thesis
Humanities/ Social Science Elective	Dev. of American Government	Ethics and the Profession	Professional Presentations
Vibrations	Hydrodynamics		Special Topics
Electrical Engineering I	Electrical Engineering II	Engineering Economics	Senior Seminar
	Ship Design I	Ship Design II	Ship Design III
Ship Resistance & Propulsion (NA III)	Ship Structures (NA IV)	Ship Dynamics (NA V)	Propulsor Design & CFD (NA VI)
Mar. Eng. Applied Thermo. (ME IV)	Ship Auxiliary Systems (ME V)	Ship Propulsion Systems (ME VI)	Marine Transportation (NA VII)

Winter Internships:

⚓ Seniors & Juniors: Design or research firms
⚓ Sophomores: Ocean-going ships
⚓ Freshmen: Shipyards

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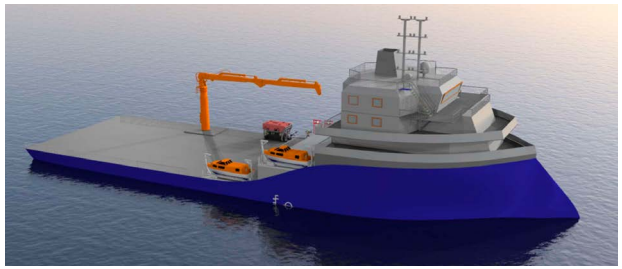
RO RO
TRUCK FERRY
OFFSHORE WIND
FARM SUPPORT

C.T.H.U.L.H.U SSV
Salvage Support Vessel



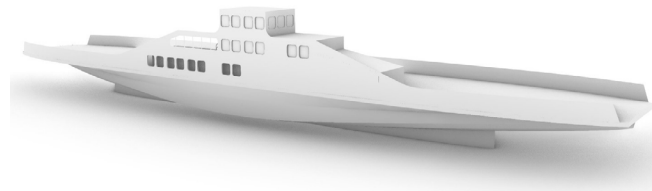
Ian Cosic, Dillon Esposito-Kelly, Bret Sharman, and Cross Weeks

The standard anticipated mission of the vessel is the oil extraction from RULET wrecks. For this purpose, the vessel is outfitted with subsea oil extraction system, and dive capability to 150ft. The vessel is also capable of installation of a deck mounted 3 chamber saturation diving system for deeper wrecks. Also, the vessel is capable of towing a barge by the hip or over the stern.

LOA: 250 ft
Beam: 75 ft
Depth: 24 ft
Draught Maximum: 18 ft

Gross Tonnage: 479
Crew: up to 47 persons
Speed: Up to 15 kn
Total power: Up to 12 eMW

CROSS-HARBOR RORO TRUCK (CHARRT) FERRY
RoRo Truck Ferry



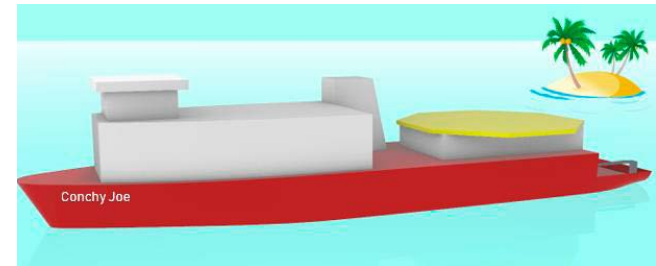
Inga Johansson, Alex Koziol, and Hank Rouland

The CHaRRT Ferry was designed for the NYC Economic Development Corporation's Ports and Transport Division. The ferry is designed for a daily round trip from Port Newark to Pier 81 in Manhattan. This truck ferry will relieve rush hour bridge traffic and is representative of a collective movement towards short sea shipping.

LOA: 89 m
Beam: 17.9 m
Draft, design: 3.6 m
Design Speed: 15 knots

Operation: NY Harbor
Propulsion: L-drive azimuth
2 x 1000 kW
Daily electrical cons: 3.8 MWhr

M/V *CONCHY JOE*
Humanitarian Relief Vessel



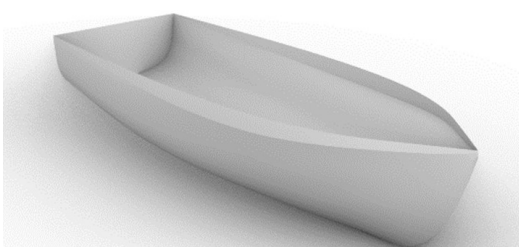
Daniel Desio, Addie Lindyberg, Shannon Liu, and Lina Tenenbaum

This purpose-built humanitarian relief vessel is designed to respond to natural disasters in the Caribbean. It is capable of delivering supplies, relief workers, communications, a medical team, fresh water, and survey equipment for a command and control center. The vessel is capable of remaining on-site for 14 days without requiring replenishment.

LOA: 75 m
LBP: 72.1 m
Beam: 18 m
Depth: 11 m

Draft: 6 m
Displacement: 5502 MT
Maximum Speed: 20 kts
Crew: 10/45

TEAM HOT STUFF
Fireboat



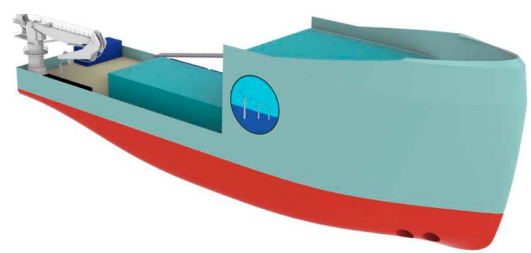
Jack Becker, Jackson Juska, and Maggie Maguire

In response to an increasing need for firefighting services in the Port of Los Angeles/Long Beach area, the Los Angeles Fire Department (LAFD) has commissioned Team Hot Stuff to design a new class of firefighting vessels. This class must bridge the gap between the LAFD's existing larger and smaller vessels by providing not only a fast response time but also a large pumping capacity.

LOA: 65 ft
LBP: 60 ft
Beam: 20 ft
Depth: 13 ft

Draft (full load): 5.9 ft
Complement: 4
Maximum Capacity: 12
Maximum Speed: 25 kts

OFFSHORE WIND FARM SUPPORT VESSEL
Offshore Wind Farm Support Vessel



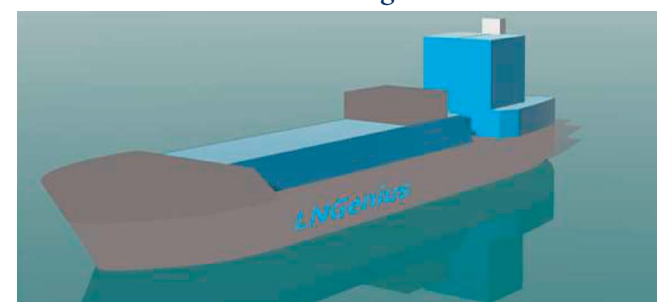
Ryan Flanagan, Robert Maes, and Sean Healy

The mission of this vessel is to support future offshore wind farms in the United States. The ship accommodates up to 30 technicians, has a motion compensated walk-to-work gangway, two work areas, a deck crane, utility gangway, and is capable of DP-2.

LOA: 60 m
Beam: 15 m
Draft: 5.25 m
Displacement: 3030 tonnes
Open Work Area: 120 m^2

Sheltered Work Area: 118 m^2
Economical Speed: 10 knots
Maximum Speed: 15 knots
Fuel Oil: 500 m^3
Fresh Water: 300 m^3

4,200 M^3 LNG BUNKERING VESSEL
LNG Bunkering Vessel



Alec Bidwell, Oscar Como, Luke Herbermann, and Ben Hunt

The mission of this concept design is to bunker two cruise ships, operating out of San Juan, PR and Miami, Florida. Cargo will be loaded at the JAX LNG Terminal in Jacksonville, Florida. Two identical bunkering vessels will service the route on a staggered rotation, ensuring each cruise ship receives 1500m^3 of LNG each week.

LOA: 95 m
Beam: 20 m
Depth: 10 m
Draft: 4.1 m
Complement: 15

Service Speed: 14 knot
Maximum Speed: 16 knot
Lightship Displacement: 2687 MT
Full Load Displacement: 5050 MT
Dual Fuel Diesel Electric System