



UNC CHARLOTTE

The WILLIAM STATES LEE COLLEGE of ENGINEERING

Senior Design Newsletter

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Beach Wheelchair Project

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Senior Design I Fall 2011

SMITH SETZER & SONS, INC.
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Concrete and Corrugated Metal Pile, Post-Cast Curb Retain,
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Overview

- The objective of this project was to design and construct a beach wheelchair that is manually powered.
- Chair will resist abrasion and corrosion from the sand and saltwater.
- A locking/tilt mechanism was designed for the seat allowing for the user to recline back and relieve pressure on the spine.
- Arm and leg supports are adjustable and removable.

Adjustable Recline

- Pinned connections allow jack to rotate about connections.
- Valve handle locks ram cylinder for desired angle.
- Recline adjustment aids when moving occupant from bed to chair, using back board or lift system.

Requirements

- The chair must fit through standard doorways.
- Back rest must recline a minimum of 30 degrees.
- Corrosion resistant material must be used.
- Must disassemble with common house hold tools.
- Total length must be under 56 inches.
- Arm and leg supports must be movable for easy egress and ingress.
- Seat must not exceed a height of 22 inches.
- Chair must have an Oxygen tank carrying compartment.
- Low resistance to rolling across various terrain.
- Must support a load capacity of 350 lbs.

Track System

- 1/2 inch offset for the center wheel.
- Tensioner to adjust track.
- Large contact area of 51.5 in².
- Track belting is PVC 150 cover by cover with an A section guide.

Adjustable Leg Supports

- Angle adjustments to allow legs to be angled downward or straight out from chair.
- Supports quickly remove from the chair.
- The leg supports are slit leaving space for a pull handle.

Adjustable Arm Rests

- Arm rests have width adjustments.
- Arm rests reposition as the chair inclines and declines.

Oxygen Tank Holder

An Oxygen tank holder will be mounted under the seat so that tank changes are quick and simple.

Drain hole to prevent water and sand build up

Contact Information

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Highlighted Fall 2011 Project: Beach Wheelchair

The Beach Wheel Chair project sponsored by Smith Setzer and Sons, was one of the projects that got a significant amount of attention at the December EXPO. The main purpose of this project was to design and construct a wheelchair that is manually pushed onto the beach that will not corrode in the sand and saltwater. An innovative locking tilt mechanism was designed for the seat allowing the user to recline and relieve pressure on the spine. Come to the EXPO on May 3rd to see the prototype of this unique project and all the others listed on our website: <http://srdesign.uncc.edu/projects/53-2012-fall-projects.html>

Call for Fall 2012 Projects!!

Missed the deadline for a spring 2012 start? No worries, we are currently accepting project descriptions until July 1 for the fall 2012 semester. Forms and instructions are available on our website at: www.srdesign.uncc.edu/company-information.html. It's never too late to submit a project, and it has never been easier to propose a project! Use the on-line project request form on the PROJECTS page on our website that asks for all the information we need.



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Conceptual Design Reviews

After reviewing the schedule below, if you are able to attend, please email Bill Heybruck so we can ensure you receive a parking token. For those who are able to attend, we may ask for you to give feedback utilizing a scoring sheet. Project descriptions can be found on our website (www.srdesign.uncc.edu).

Project name	CDR Date	CDR Time	CDR Room
METSO Biogas 2	3/23/2012	14:00	Duke 259
FSAE Carbon Fiber Layup Program	3/23/2012	14:25	Duke 259
FSAE Suspension / Chassis Design	3/23/2012	14:50	Duke 259
FSAE Engine Team Spring 2012	3/23/2012	15:15	Duke 259
Case for DP Generator	3/23/2012	14:00	Smith 218
Development of Small Scale Wind Turbine Blades using Hybrid Fiber Compositers	3/23/2012	14:25	Smith 218
Einstein Refrigerator	3/23/2012	14:50	Smith 218
Stirling Engine Development	3/23/2012	8:00	Duke 259
Expander and Compressor for IPAC	3/23/2012	8:25	Duke 259

Chariots for Disabled Children 2	3/29/2012	18:20	Duke 324
Chariots for Disabled Children 1	3/29/2012	18:45	Duke 324
Spectral Images	3/29/2012	19:15	Duke 324

Metal Organic Chemical Deposition Growth of ZnO Wide Bandgap Materials and Devices	3/30/2012	14:00	Woodward 244
Hand Held Magnetic Dust Removal Brush	3/30/2012	14:25	Woodward 244
Laser Scanner with iPad Control	3/30/2012	14:50	Woodward 244
Solar Cellphone Charging Hub	3/30/2012	15:15	Woodward 244
Dry Cask Storage of Spent Nuclear Fuel	3/30/2012	14:00	Duke 259
Powered Exoskeletal Shoulder Assistive Device	3/30/2012	14:25	Duke 259
Pallet Jack for Grigg Hall	3/30/2012	14:00	Duke 275
Automatic Artifact 1	3/30/2012	14:25	Duke 275
Automated Artifact 2	3/30/2012	14:50	Duke 275
Micro Scale Wind Turbine Development	3/30/2012	15:15	Duke 275

Mark your calendar for our spring/summer 2012 Senior Design dates:

March 23 and March 30, Spring Projects Conceptual Design Reviews

May 3, Spring Senior Design EXPO

July 1, Deadline for Fall Project Submissions



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December 7, Fall Senior Design EXPO

Need More Information or Have Questions?

Check out our website <http://www.srdesign.uncc.edu> or contact Bill Heybruck at 704-687-2934 (wfheybru@uncc.edu). Please REPLY with "REMOVE" if you would not like to receive future issues.

For a campus map visit: <http://facilities.uncc.edu/design-services/campus-maps/campus-maps>