**Senior Design Projects**

**Marshall Space Flight Center**

**A. Description/Instructions**

NASA Marshall Space Flight Center intends to recruit university Senior Design teams to study and provide solutions to NASA aerospace problems and projects.

There are many accredited colleges of engineering in the U.S. and all are required to teach a Senior Design capstone course each year. Professors teaching/administering these courses can find suitable topics/projects which lend themselves to completion in either one semester (15 weeks) or two (30 weeks).

Because the U.S. Space Program is challenging and inspiring to college students, NASA projects, such as those listed, could be appealing to professors operating Senior Design classes.

Marshall researchers are eager to have teams of advanced students (seniors) applying their skills/knowledge to develop solutions to NASA’s aerospace problems. Using NASA projects as the subject of Senior Design studies has been piloted at Marshall, with excellent results.

The projects listed below have been proposed by Marshall engineers and scientists and are available to U.S. colleges and universities. To choose one of the listed projects and to qualify for NASA funding, your team and faculty advisor first complete a one/two-page proposal using the template attached and send it to: Dr. Frank Six, MSFC University Affairs Officer at [frank.six@nasa.gov](mailto:frank.six@nasa.gov).

After evaluation, those proposals chosen for funding will be notified. MSFC will contribute $1,000 to a chosen Senior Design team (one semester project) and $2,000 to a team chosen for the two semester option. The final deliverables would be a written project report for a one semester effort, and a final report plus a prototype/model for a two semester course. Several Senior Design teams will be selected each year, and funding provided, depending on budget approval.

Weekly telecons between NASA mentors and Senior Design teams will provide progress information on each effort, and address questions from the teams on modifications, adding experts, providing utilization of facilities, etc.

Development of NASA’s future workforce is our motive for engaging young professionals (college students) in aerospace projects.

**B. Senior Design Proposal Template**

Proposer – Faculty Advisor for Senior Design Project

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Academic Rank: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contact Information: Email: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Advisors Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

University’s Name & Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date the Senior Design Course will begin \_\_\_\_\_\_\_\_\_\_\_\_ and end \_\_\_\_\_\_\_\_\_\_\_\_ (Period of Performance)

Title of Project to be Studied: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Senior Design Course: ⬜ One semester, or ⬜ Two semesters

Marshall Mentor’s Name and Organization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approximate number of student participants: \_\_\_\_\_\_\_\_\_\_\_\_

Will there be a graduate student as a mentor for this project: ⬜ Yes ⬜ No ⬜ Maybe

Proposed approach to solving the problem/s and/or completing the project:

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Provide a schedule/timeline covering all aspects of the problem/project: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Date Submitted: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**C. MSFC Projects Listing**

The following aerospace projects have been proposed by Marshall engineers and scientists and are available to U.S. colleges and universities.

1. Deployment System for Satellite Solar Array – John Carr, ES44
2. Solar System Communications Network – Eric Eberly, ES11
3. Slosh Baffle Stabilization – Marlon Holt, ET40
4. Electric Sail Deployer Mechanism – Tom Bryan, ES10
5. Labview on Raspberry Pi 3 with Touchscreen – Kosta Varnavas, ES36
6. Tether Deployer for Spacecraft – Bruce Wiegmann, ED04
7. Terraforming From L1 – Les Johnson, ST03
8. Thermal Protection System Testing – Amy Buck, EM41 [Currently not available]

**Proposals for fall 2018 Senior Design courses should be submitted by September 15, 2018 to Dr. Frank Six at frank.six@nasa.gov.**

**NASA Marshall intends to review proposals as they are received.**

**Awards and regrets will be announced.**

**D. Project Descriptions**

