

# Workshop A - Implementing the "Design Your Process of Becoming a World Class Engineering Student" Project

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**Abstract** - Many students come into an engineering program lacking a strong commitment to stay in an engineering program and to graduate with an engineering degree. For students to accomplish the challenging goal of graduating in engineering requires a strong commitment, and behaviors and attitudes to follow through that commitment. To strengthen the commitment of the freshman engineering students an innovative project has been developed. The project challenges students to develop their process to become a "World-Class Engineering Student". Having freshman engineering students design their individually tailored learning process as part of a semester long project in the setting of a student success focused introduction to engineering course or any freshman engineering course will have a significant impact on their academic success by improving the students' confidence and motivation to succeed in engineering. This workshop will show participants how to implement the "Design your Process to become a World-Class Engineering Student" into their own introduction to engineering courses.

*Index Terms* - student success, design project, first year students

## INTRODUCTION

There is a current concern about the growing need for more engineers in the U.S., and therefore freshman engineering student retention needs to be improved. A national study conducted by Michelle J. Johnson and Sheri D. Sheppard [1] shows that over 30% of freshman engineering students do not finish with a degree. Even more concerning is that only 8% of all students enrolling in a 4 year college chose an engineering program. This demonstrates the importance to focus on freshman engineering education and enhancing the students' commitment to graduate with an engineering degree.

Approximately 100 students start each semester at the School of Engineering at the University of Alaska Anchorage. The goal of the current study is to improve these new engineering students' chance of continuing in the engineering program and succeeding.

A recent study on why students stay in engineering has shown that increasing the freshman student's academic confidence helps the student adjust to the rigorous engineering curriculum [2]. In another study, students ranked "drive and motivation" as one of the top influences to believing they could succeed [3]. Successful minority retention programs have focused on community building, academic success skills, personal development, professional development, and orientation in a freshman introductory engineering course [4]. The 2004 ACT policy report on The Role of Academic and Non-Academic Factors in Improving College Retention identified the following factors as the strongest in predicting college retention or performance: academic-related skills, academic self-confidence, and academic goals [5].

Therefore, having freshman engineering students design their individually tailored learning process as part of a semester long project in the setting of a student success focused introduction to engineering course will have a significant impact on their academic success by improving the students' academic-related skills, confidence and motivation to succeed in engineering.

## PROJECT DESCRIPTION

The project "Design your Process for Becoming a World-Class Engineering Student" asked students to design their own individual process to be successful in graduating with an engineering degree. The project challenges students to evaluate themselves against a "world-class" engineering student using the following tasks:

- Set your goal(s), which major to pursue, graduating with an engineering degree, etc.
- Strengthen your commitment to your goal(s)
- Clarify your goal(s)
- Set-up a "Road Map", a plan to guide you over the next years to graduation
- Be prepared to deal with adversity
- Outline what attitudes and behaviors you need to change/add to be successful
- Enhance your self-awareness and improve your skills to practice academic success strategies
- Build relationships, making effective use of your peers

- Manage time and tasks
- Organize your learning process
- Co-curricular activities
- Navigate the UAA system, resources and academic advising
- Add at least three additional objectives you perceive are important for your success

To help guide students in evaluating themselves they are asked to implement a three step process:

- a. What is your current status on implementing these topics/objectives
- b. Where should a "world-class" engineering student want to be on each of these objectives
- c. What you need to do to move from where you are to where you want to be

By analyzing part a. and b. students are able to answer c. which tells them their process to success for each individual objective/task.

The minimum recommended length of the paper is set at eight pages, but students are encouraged to write 10 pages or more, and no maximum page limit is enforced. Format requirements are provided to the students:

- use font styles Arial, Calibri or Times New Roman with a font size of 12
- use 1.5 line spacing
- use 1 inch margins on all sides

In addition a word template document including the required cover sheet is provided to students. The full project statement, as implemented at the University of Alaska Anchorage, is available to everyone at [6].

### WORKSHOP DESCRIPTION

This workshop will present the elements needed to implement the "Design your Process to become a World-Class Engineering Student" successfully in an introduction to engineering course:

- Course design to incorporate the project
- Adjust lecture material and presentation to supplement project
- Student group activities supporting the objectives of the project
- Homework assignments supporting the objectives of the project
- The use of students keeping journals in regard to the project

Preliminary results from the implementation of the project at the University of Alaska Anchorage will be shared. Participants will have the opportunity to design their process on how to implement the "Design your Process to become a World-Class Engineering Student" into their own

introduction to engineering courses through interactive exercises.

### REFERENCES

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