UMES-SU 3+2 Dual-Degree Program in Physics/Engineering

Yuanwei Jin

Department of Engineering and Aviation Sciences

Outline

- Brief Description of the UMES/SU Articulation Agreement
- Impetus for the Development of the Agreement
- Tips and Looking Forward

Short History of the UMES Engineering Program

- Prior to 2007
  - 2+2 Feeder program to Univ of Maryland College Park
- 2007
  - Bachelor's Degree Program in General Engineering
- 2012
  - ABET Accredited
- 2016
  - 3+2 UMES-SU Physics/Engineering Program articulation agreement signed
- 2017
  - First cohort of SU students

UMES Engineering Program Requirement

- **General Education Requirement (40 credits)**
- **Supportive Math & Science (19 credits)**
- **Engineering Core Requirement (48 credits)**
- **Engineering Specialization Requirement (17 credits)**
  - Electrical Engineering Specialization
  - Mechanical Engineering Specialization
  - Computer Engineering Specialization
  - Aerospace Engineering Specialization

Salisbury University Physics Program

- Salisbury University's Physics Tracks
  - Physics: Microelectronics Track
  - Physics: General
  - Dual Physics/Engineering (90 credits at SU):
    - The dual degree engineering transfer program offers students the opportunity to earn both a degree in physics from Salisbury University and and engineering degree from an ABET accredited engineering program. Under the program, a student normally attends SU for three years and an engineering school for two years.
  - Engineering Physics
  - Physics Education

PHYSICS • Dual Degree Engineering Transfer Program

PHYSICS DEPARTMENT • HENSON SCHOOL

2017-2018

Rev. 11/15

NAME:_____ ID#:_____ DATE:_____

THIS CHECKLIST IS AN UNOFFICIAL TOOL FOR PLANNING.

Matriculated students and advisors should consult the Academic Requirements Report in GullNet before and after registering for classes each semester to track academic progress.

UNIVERSITY POLICIES

- Refer to the SU catalog for approved prerequisites and General Education courses.
- Requirements may not equal 120 credit hours. Students must register for additional electives to complete 120 credits required for graduation.
- All graduates must have a minimum of 30 credits of 300/400-level courses with C grade or above; at least 15 of those credits must be taken at SU.
- Students must have a minimum cumulative GPA of 2.0 for graduation.
- Students must complete at least 30 credit hours by direct classroom instruction and/or laboratory experience.
- Students must take 30 of the last 37 credit hours at SU.
- It is the student's responsibility to satisfy graduation requirements. Please refer to the SU catalog for detailed major requirements.
- Students must apply online for graduation by November 15 for May and by May 15 for December.

GENERAL EDUCATION REQUIREMENTS

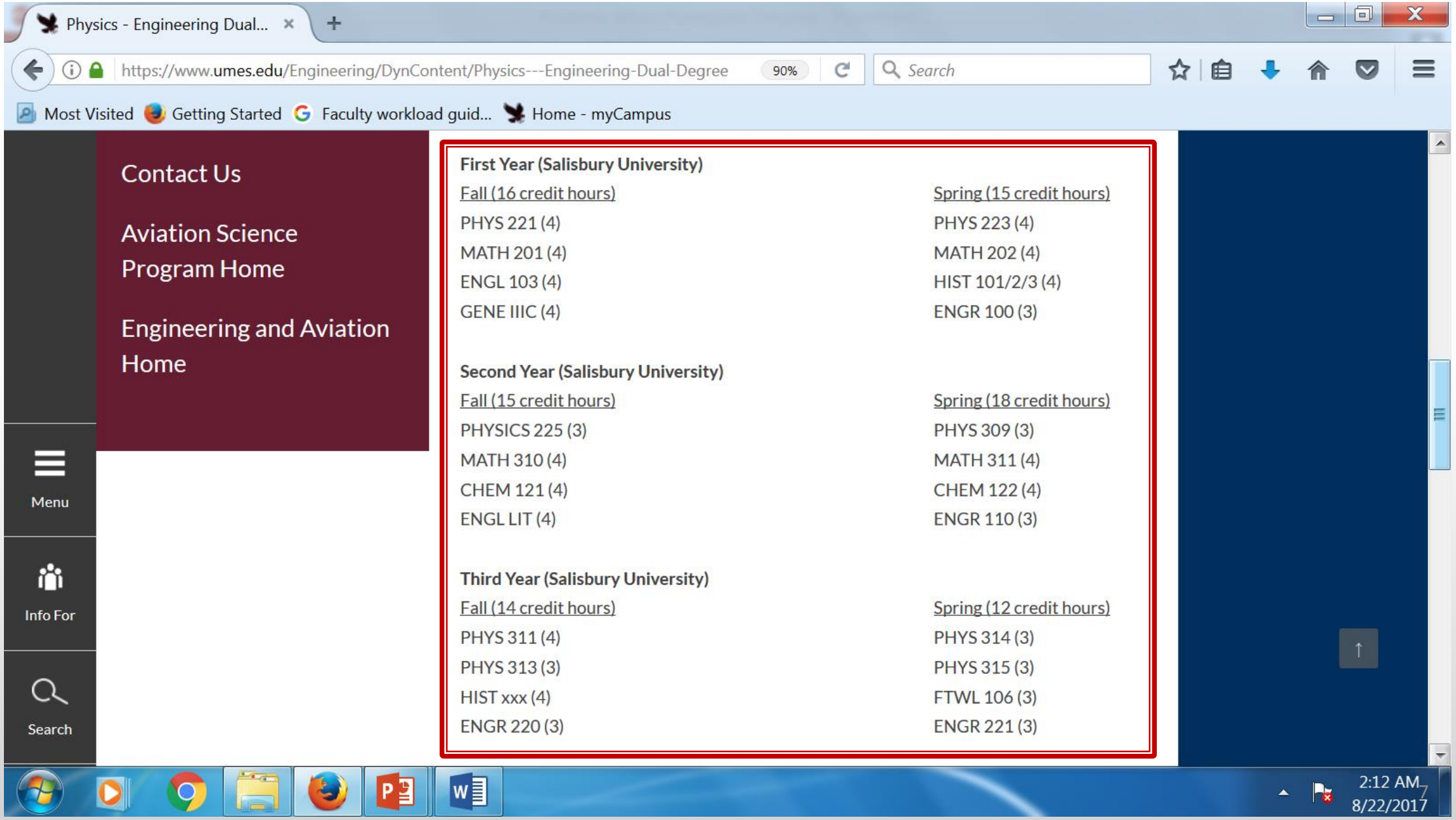
Course No. & Title	#Credits	Grade	Term Completed

MAJOR REQUIREMENTS

- All required physics courses must be completed with a minimum overall GPA of 2.0.

Course No. & Title	#Credits	Grade	Term Completed
CHEMISTRY (2 courses)			
CHEM121 - General Chemistry I	4	____	_____
CHEM122 - General Chemistry II	4	____	_____
MATH (4 courses)			
MATH201 - Calculus I	4	____	_____
MATH202 - Calculus II	4	____	_____
MATH310 - Calculus III	4	____	_____
MATH311 - Differential Equations I	4	____	_____
PHYSICS CORE (8 courses)			
PHYS221 - Physics I	4	____	_____
PHYS223 - Physics II	4	____	_____
PHYS225 - Physics III	3	____	_____

Physics/Engineering Dual Degree Curriculum (SU Part)



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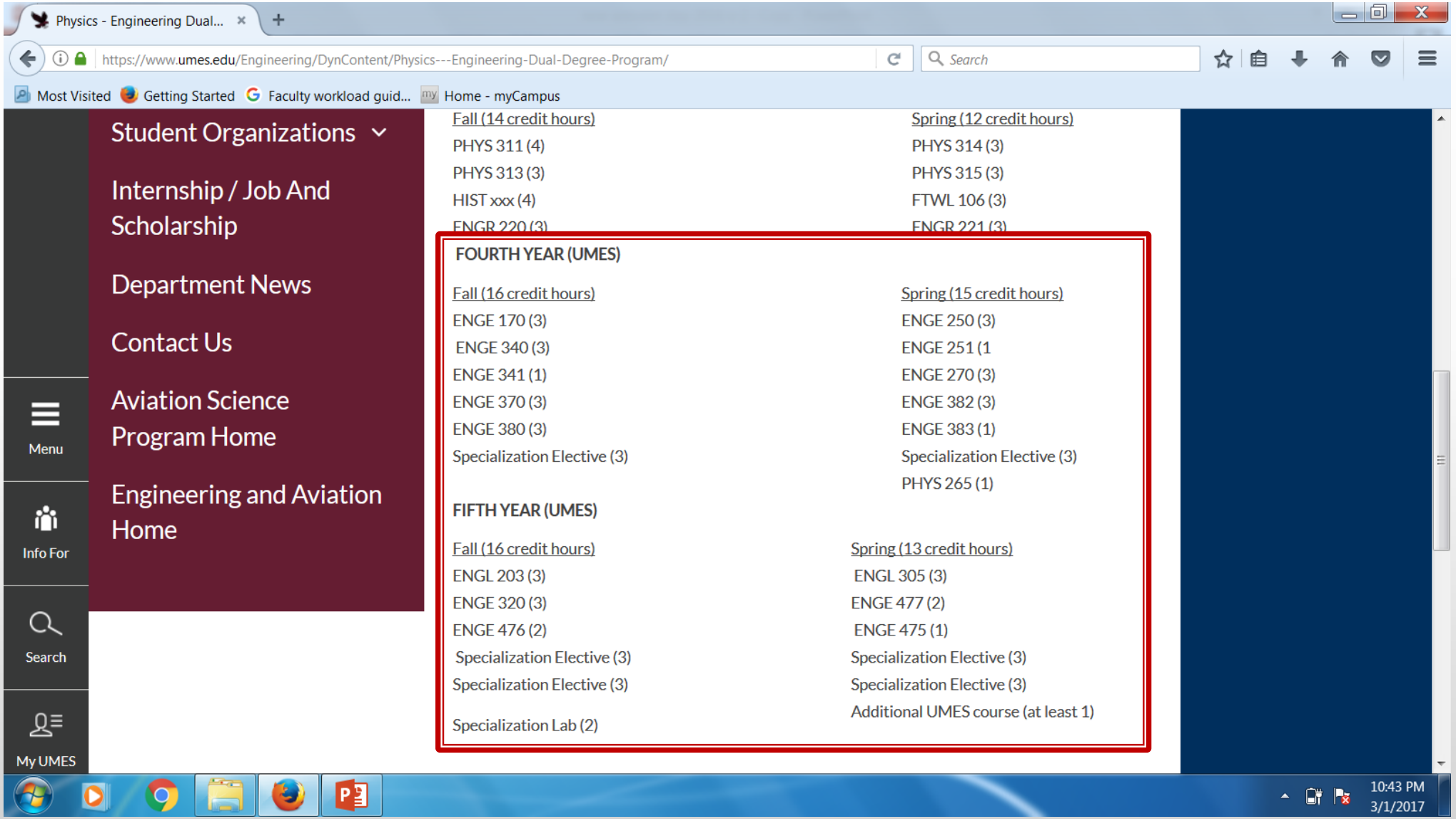

Impetus for the Development of the Agreement

- University System of Maryland (USM) Call for Action
- UMES Administration/Faculty Endorsement
- Market Demand

State chancellor promotes collaboration among SU, UMES
- USA Today Headline (Oct 1, 2015)

Caret said a “3 + 2 program” could benefit students at Lower Shore universities. An example, he said, would involve a student working toward a bachelor’s degree in a STEM program at SU, then studying at UMES for a masters degree in engineering

“We’ve done that at College Park and the University of Maryland Baltimore County,” he said. “Now that there is a full-blown engineering program at UMES, it’s possible to do it there.”

UMES Administration/Faculty Endorsement

- Dean/Chair & Registrar's Office Discussion and Dialog
  - Degree Layout
  - Curriculum
- Faculty Support
  - Course Offering Sequence and Schedule
- President/Provost Endorsement and Support

Market Analysis Example: DOD Acquisition Engineer Careers

- **Over 67% of Acquisition Engineers are in the Engineering Career Field**

08XX Engineers by Acquisition Career Field	
Acquisition Career Field	08XX Total
Engineering	31,965
Test & Evaluation	5,127
Facilities Engineering	4,848
Science & Technology Manager	1,976
Production, Quality, & Manufacturing	1,194
Program Management	1,013
Contracting	772
Busin	
Life C	
Inforr	
Indus	
Unkn	
Grand	

Acquisition Engineering Career Field 08XX by Series		
Civilian Occupational Series	Total	% of ENG
0855 - Eng., Electronics	10,580	26.8%
0801 - Eng., General	7,249	18.3%
0830 - Eng., Mechanical	5,573	14.1%
0861 - Eng., Aerospace	2,728	6.9%
0854 - Eng., Computers	2,452	6.2%
0850 - Eng., Electrical	1,288	3.3%
0893 - Eng., Chemical	486	1.2%
0896 - Eng., Industrial	439	1.1%
0871 - Architect, Naval	367	0.9%
0806 - Eng., Materials	327	0.8%
0803 - Eng., Safety	136	0.3%
0819 - Eng., Environmental	118	0.3%
0802 - Eng. Technician	84	0.2%
0810 - Eng., Civil	77	0.2%
0856 - Eng. Technician, Electronics	36	0.1%
		0.0%
		0.0%
		0.0%
		0.0%
		0.0%
Grand Total	31,965	80.8%

DOD survey: Nearly 50% of the acquisition engineering workforce will be eligible to retire by 2023

Data Source: AT&L DAW Data Mart, 30 September 2013

Employers compete for talents

- 2013 *Universum* survey of 9,770 Undergrad Engineering Majors from US based schools determined the top 10 ideal employers for engineers:

1. NASA*
2. Google
3. Boeing
4. Apple
5. Microsoft
6. Lockheed Martin
7. GE
8. Disney
9. US Department of Energy*
10. Exxon Mobile

NASA (received 19.4 % of votes) is known among US engineering schools as employer of prestige, innovation and recruiting the best students (most common answers to why they chose NASA)

Job/Internship for UMES Engineering Students

- Industry
  - Northrop Grumman
  - Raytheon
  - Lockheed Martin
  - Boeing
  - Johnson & Johnson
  - Boston Scientific
  - Siemens
  - Orbital ATK (NASA contractor)

- Government Agencies
  - US Army, US Navy, Navy Surface Combat System, NASA, DOE, etc

- Graduate Schools
  - Old Dominion, Univ. of Delaware, Oakland Univ., Morgan State, California State University, etc

Tips and Looking Forward

- Market and Demand Analysis
  - Mutual Benefits to UMES and SU
  - Market demand for students

- Marketing and Outreach
  - Reach out to SU students and faculty
  - Demonstrate the future for engineering careers

- Build a Quality Program and Reputation
  - Accreditation
  - Research and Innovation