NOMINATION FORM FOR OUTSTANDING MASTER'S GRADUATE

COLLEGE OF ENGINEERING AND COMPUTING
SUMMER 2015

PURPOSE

The Outstanding Master and Doctoral Graduates are selected through a college wide competition. This award recognizes a student's academic **EXCELLENCY** and ***EXEMPLARY SERVICE*** to his or her department while pursuing his/her degree.

- The **Outstanding M.S. Graduate Award** is presented to one student.
- The faculty of each department chooses a **nominee** for each major at the Master's level.
- There may not be a nominee for each major every semester.
- There may not be a winner every semester.

CRITERIA

An **Outstanding M.S. Graduate** is a student with at least a 3.5 GPA **AND** has been very active in his/her

- Quality & Impact of research, including publications, patents, awards, and scholarships in national and international conferences, in journals, trade magazines, and similar forums. **The publications should be limited to those produce while at FIU.**
- Presentations at conferences: research presentations at national or international meetings. **The presentations should be limited to those made while at FIU.**
- Professional societies: an officer, or a very active member not just a member;
- Departmental activities: has supported the department activities such as E-Week Activities, represented the department in E-Week Activities at the college level, part of recruitment team / visits to High schools, technical competitions, and so forth.
- College activities: part of the Ambassadors Team, the recruitment team, etc.
- Local community: Mentoring, habitat for Humanity, etc.
- Mentorship to undergraduate students: has been an active mentor to one or more undergraduate students, or has mentored high school students.

The Graduate Program Directors and Associate Dean for Graduate Studies will evaluate the student's achievement under the framework of the **duties assigned**, and realizing that these nominees are Graduate students who are expected to have a high GPA. The **distinguishing traits reside in the professional production and the service**.

At the ceremony, an excerpt of the student's accomplishments will be read based on the

1. Nominator Additional Comments, and
2. Letter of support from department chair

CHECK LIST FOR NOMINATOR

	Part A Completed
	Part B Completed
	Nominator's Additional Comments (optional)
	Part C Completed
	Copy of students unofficial transcripts
	Letter of support from department chair
	Student will graduate this semester
	Student will be present at the ceremony

Return all materials, by email, to: Dr. Kang Yen at yenk@fiu.edu and cc Ms. Laura Gim enez at gimenezl@fiu.edu

Nomination Form Outstanding Master Graduate

COLLEGE OF ENGINEERING AND COMPUTING

Student Name: Christopher Emerson Panther ID: 2986495

FIU Graduate GPA: 3.84 (GPA ≥ 3.5) Email: cemer002@fiu.edu

Department:
- [ ] Biomedical
- [ ] Electrical & Computer
- [ ] Civil & Environmental
- [x] Mechanical & Materials
- [ ] Construction Management
- [ ] SCIS

Program:
- [ ] Engineering Management

Major: Master of Science in

- [ ] Biomedical (BME)
- [ ] Construction Mngmt (CM)
- [ ] Information Technology (IT)
- [ ] Civil (CE)
- [ ] Electrical (EE)
- [x] Materials (Mat)
- [ ] Computer Engr (CpE)
- [ ] Enginr. Management (EM)
- [ ] Mechanical (ME)
- [ ] Computer Science (CS)
- [ ] Environmental (EnvE)
- [ ] Telecommunications (TCN)

PART A: Thesis / Project Work

Thesis / Project Title: The Microstructure and the Electrochemical Behavior of Cobalt Chromium Molybdenum Alloys from Retrieved Hip Implants

Major Professor: Kinzy Jones

Thesis / Project Abstract: THE MICROSTRUCTURE AND THE ELECTROCHEMICAL BEHAVIOR OF COBALT MOLYBENUM ALLOYS FROM RETRIEVED HIP IMPLANTS

Because of their excellent mechanical, tribological, and electrochemical properties, Cobalt Chromium Molybdenum (CoCrMo) alloys have been used as the material for both the stem and head of modular hip implants. Corrosion is one mechanism by which metal debris, from these implants, is generated, which can lead to adverse events that requires revision surgery. Manufacturing process such as wrought, as-cast, and powder metallurgy influences the microstructure, material properties, and performance of these implants

The current research focuses on analyzing the microstructure of CoCrMo alloys from retrieved hip implants with optical and scanning electron microscopy. Additionally, energy disperse spectroscopy was utilized to determine weight composition of cobalt, chromium, and molybdenum in solution. Potentiodynamic polarization was used as an accelerated corrosion testing method to determine the electrochemical behavior of the different microstructures. In agreement with prior literature, it was found that Low Carbon Wrought CoCrMo Alloys have the best corrosion resistance properties.

PART B: Student's Curricular and Extracurricular Activities

Provide the following information:

Student work in regards to

1. Publications: **(limited to those produce while at FIU).**
   a. 2014 ASTM Manuscript Submission: "Trunnion Options in Primary Hip Arthroplasty in 2014"

b. 2014 CORR Manuscript Submission: "Tapers in Total Hip Replacement: Manufacturing, Design and Surgical Assembly, Surgeon Knowledge and Company Transparency"
c. 2015 AAOS Scientific Exhibit "Metallurgy for Surgeons: What you need to know"

See also the additional comments section 11.

2. Presentations at conferences: (**limited to those made while at FIU).**
   a. ASTM International 2014 Symposium on Modularity and Tapers in Total Joint Replacement Devices - New Orleans, LA
   b. Lecture: Trunnion Options in Primary Total Hip Arthroplasty in 2014
   c. Scientific Exhibit at the 2015 American Academy of Orthopedic Surgeons - Las Vegas, NV, "Metallurgy for Surgeons: What you need to Know"
   d. Scientific Exhibit abstract submission to the 2016 American Academy of Orthopedic Surgeons – Orlando, FL, "Metals in Spinal Fusion: Design, Materials, and Concerns"

3. Mentorship to undergraduate students (list name of students mentored)
   Daniel Pico (Mechanical Engineering)

4. Duties assigned: as part of TA/RA
   a. Investigated the causes of corrosion within the Morse Taper of Hip Prosthesis
   b. Performed literature reviews and wrote manuscripts of papers for Total Hip Arthroplasty and Total Knee Arthroplasty
   c. Analysis of explanted hip implants using XRD, SEM/EDS, and GAMRY Instruments. Working with CoCrMO and Ti-6Al-4V alloys
   d. Accelerated corrosion tests: open current potential and cyclic polarization
   e. Finite Element Modeling of hip implant with Ansys

5. Honor & Awards
6. Fellowship & Scholarships
   a. RA for the duration of MS degree

Student involvement in

7. Professional societies
8. Departmental activities
9. College activities
10. Local community

    Since November 2013 has volunteered at Nicklaus Children's Hospital (formerly Miami Children's Hospital) and has accumulated over 400 volunteer hours in both the surgical care unit known as 2East and with the Pediatric Hospitalist Department. He also volunteers as a researcher with the Pediatric Hospitalist Department and the Department of Orthopedics.

11. Nominator Additional Comments (preferably the Major Professor)
12. Additional Comments: unique stories, special situation that makes the students accomplishment even more remarkable.

a. He is implementing the Pediatric Hospitalist Choosing Wisely Campaign – on going project with the Children's' Hospital Association, Texas Children's Hospital and Nicklaus Children's Hospital. The goal is to devise an objection metric to measure how well children's hospitals through the United States adhere best practice standard of evidence-based medicine.

b. From January 2014-May 2015, he has held a part time research associate position at the Arthritis Surgery Research Foundation, a non-profit research foundation affiliated with Larkin Community Hospital
c. He has been accepted to Boston University School of Medicine, University of Central Florida College of Medicine, and University of Miami Miller School of Medicine. In August 2015, he will be starting medical school at UM. His goal is to become an Orthopedic Surgeon and combine his interest in engineering to help solve current medical and healthcare problems.
d. He received his undergraduate degree in Biomedical Engineering at FIU. While an undergraduate, he also made two presentations:
"Trafficking the intracellular pathway of multifunctional nanoparticles in cancer cell lines" at the National Conference of Undergraduate Research in La Crosse, WI 2013.
Poster "The Allosteric Effects of Ametantrone and Anthraquinone Derivatives on the Binding of DNA Polymerase I to PhiX 174 RF DNA" at the National Conference of Undergraduate Research in Ogden, UT 2012.

PART C: Additional Documentation

Attach a:
1. Copy of students unofficial transcripts
2. Letter of support from department chair

PART D: Electronic Submission

- PDF file of this completed **form**.
- PDF of **Letter of support from Department Chair**
- Electronic version of **Transcripts** (PDF or JPG)

Report Results

Return

UGRD and GRAD Record Unofficial

Name : Christopher Emerson
Student ID: 2986495
Address : 7421 SW 148th Street
Palmetto Bay, FL 33158-2142
United States
Print Date : 2015-07-03

- - - - - Degrees Awarded - - - - -

Degree : Bachelor of Science
Confer Date : 2013-04-27
Degree GPA : 3.540
Degree Honors : Cum Laude
Plan : Biomedical Engineering
Plan : Chemistry - Minor
Graduated through the Honors College

- - - - - Test Credits - - - - -

Test Credits Applied Toward Academic Program

FALL 2009

AMH	2020	Am.History 1850-Pres	3.00	3.00 TR	
AMH	2041	Origins Am Civ	3.00	3.00 TR	
ECO	2013	Principles Macroeco	3.00	3.00 TR	
ELE	UCC1	ELE UCC1	3.00	3.00 TR	
ENC	1101	Writing and Rhetoric I	3.00	3.00 TR	
EUH	2030	West Civ: Mod/Eur	3.00	3.00 TR	
MAC	2311	Calculus I	4.00	4.00 TR	
POS	2042	American Government	3.00	3.00 TR	
Test Trans GPA:	0.000	Transfer Totals :	25.00	25.00	0.000

Florida International University

- - - - - Beginning of Undergraduate Record - - - - -

FALL 2009

Program : Academic Adv Ctr - Lower Div
Plan : Mechanical Engineering (BS) Major:

CHM	1045	Gen Chemistry I	3.00	3.00 A-	11.010
CHM	1045L	Gen Chem Lab I	1.00	1.00 B	3.000
ENC	1102	Writing and Rhetoric II	3.00	3.00 A	12.000
IDH	1001	Honors Seminar I	3.00	3.00 A	12.000
Course Topic(s): Origins of Ideas/Ideas of Orig					
MAC	2312	Calculus II	4.00	4.00 C+	9.320
SLS	1501	First Year Exper	1.00	1.00 A	4.000
TERM GPA :	3.420	TERM TOTALS :	15.00	15.00	51.330
CUM GPA :	3.420	CUM TOTALS :	15.00	40.00	51.330

SPR 2010

Program : Academic Adv Ctr - Lower Div

Plan : Mechanical Engineering (BS) Major:

CHM	1046	Gen Chemistry II	3.00	3.00	A	12.000
CHM	1046L	Gen Chem Lab II	1.00	1.00	B+	3.330
IDH	1002	Honors Seminar II	3.00	3.00	A	12.000
	Course Topic(s): Origins of Ideas/Ideas of Orig					
IDH	1931	Hon Leadership Sem	1.00	1.00	A-	3.670
	Course Topic(s): Honors Leadership Seminar					
MAC	2313	Multivariable Calc	4.00	4.00	B	12.000
PHY	2048	Physics W/Calculus I	4.00	4.00	A	16.000
PHY	2048L	General Phys Lab I	1.00	1.00	A	4.000
	TERM GPA : 3.710	TERM TOTALS :	17.00	17.00		63.000
	CUM GPA : 3.570	CUM TOTALS :	32.00	57.00		114.330
	** Dean's List **					

SUM 2010

Program : Academic Adv Ctr - Lower Div

Plan : Mechanical Engineering (BS) Major:

BSC	1010	General Biology I	3.00	3.00	B	9.000
BSC	1010L	Gen Biology Lab I	1.00	1.00	B	3.000
MAP	2302	Differential Equat	3.00	3.00	A	12.000
	TERM GPA : 3.430	TERM TOTALS :	7.00	7.00		24.000
	CUM GPA : 3.550	CUM TOTALS :	39.00	64.00		138.330

FALL 2010

Program : Engineering

Plan : Biomedical Engineering - BS Major

CHM	2210	Organc Chem I	4.00	4.00	A-	14.680
CHM	2210L	Org Chem Lab I	1.00	1.00	A	4.000
EGN	1002	Engineering Orient	2.00	2.00	B+	6.660
IDH	2003	Honors Seminar III	3.00	3.00	A-	11.010
	Course Topic(s): Inhabiting Other Lives					
PHY	2049	Physics W/Calc II	4.00	4.00	A	16.000
PHY	2049L	General Phys Lab II	1.00	1.00	A	4.000
	TERM GPA : 3.760	TERM TOTALS :	15.00	15.00		56.350
	CUM GPA : 3.610	CUM TOTALS :	54.00	79.00		194.680
	** Dean's List **					

SPR 2011

Program : Engineering

Plan : Biomedical Engineering - BS Major

BME	2740	BME Simulation	3.00	3.00	B	9.000
BSC	1011	General Biology II	3.00	3.00	C	6.000
BSC	1011L	Gen Biology Lab II	1.00	1.00	B	3.000
CHM	2211	Organic Chem II	3.00	3.00	B-	8.010
CHM	2211L	Organic Chem Lab II	1.00	1.00	A	4.000
IDH	2004	Honors Seminar IV	3.00	3.00	A	12.000
	Course Topic(s): Inhabiting Other Lives					
STA	3033	Prob & Stat For Cs	3.00	3.00	B-	8.010
	TERM GPA : 2.940	TERM TOTALS :	17.00	17.00		50.020

CUM GPA :	3.450	CUM TOTALS :	71.00	96.00		244.700

SUM 2011

Program : Engineering
Plan : Biomedical Engineering - BS Major

CHM	4304	Biol Chemistry I	3.00	3.00 A	12.000
CHM	4304L	Biol Chem I Lab	1.00	1.00 A-	3.670
EEL	3110	Circuit Analysis	3.00	3.00 B+	9.990
EEL	3111L	Circuits Lab	1.00	1.00 A	4.000
TERM GPA :	3.710	TERM TOTALS :	8.00	8.00	29.660
CUM GPA :	3.470	CUM TOTALS :	79.00	104.00	274.360

FALL 2011

Program : Engineering
Plan : Biomedical Engineering - BS Major

BME	3403	Eng An Bio Sys I	3.00	3.00 A-	11.010
BME	3721	BME Data Eval Prin	3.00	3.00 B+	9.990
EEE	4202C	Med Instrum Design	4.00	4.00 B	12.000
EGM	3503	Applied Mechanics	4.00	4.00 B+	13.320
IDH	4905	Honors Independ Stud	3.00	3.00 A	12.000
TERM GPA :	3.430	TERM TOTALS :	17.00	17.00	58.320
CUM GPA :	3.470	CUM TOTALS :	96.00	121.00	332.680

SPR 2012

Program : Engineering
Plan : Biomedical Engineering - BS Major

BME	3404	Eng An Bio Sys II	3.00	3.00 A	12.000
BME	4011	Clinical Rotations	1.00	1.00 A	4.000
BME	4531	Medical Imaging	3.00	3.00 B+	9.990
EML	3036	Simultn Software ME	3.00	3.00 A	12.000
IDH	4007	Honors Seminar Vii	3.00	3.00 A	12.000
IDH	4905	Honors Independ Stud	2.00	2.00 A	8.000
IDH	4905	Honors Independ Stud	1.00	1.00 A-	3.670
TERM GPA :	3.850	TERM TOTALS :	16.00	16.00	61.660
CUM GPA :	3.520	CUM TOTALS :	112.00	137.00	394.340

** Dean's List **

SUM 2012

Program : Engineering
Plan : Biomedical Engineering - BS Major

BME	3632	BME Transport	3.00	3.00 B	9.000
IDH	4008	Honors Seminar Viii	3.00	3.00 A	12.000
TERM GPA :	3.500	TERM TOTALS :	6.00	6.00	21.000
CUM GPA :	3.520	CUM TOTALS :	118.00	143.00	415.340

FALL 2012

Program : Engineering

Plan : Biomedical Engineering - BS Major

BME	4050L	BME Lab I	1.00	1.00	B	3.000
BME	4090	Design Proj Org	1.00	1.00	A	4.000
BME	4100	Biomaterials	3.00	3.00	A	12.000
BME	4311	Molec Eng	3.00	3.00	A-	11.010
BME	4800	Des Biomed Devices	3.00	3.00	A	12.000
BME	4930	Undergrad Seminar		0.00	P	
CHM	3120	Intro Analyt Chem	3.00	3.00	A-	11.010
CHM	3120L	Intr Analyt Chm Lab	1.00	1.00	A-	3.670
IDH	4905	Honors Independ Stud		0.00	A	
IDH	4905	Honors Independ Stud		0.00	A	
	TERM GPA : 3.780	TERM TOTALS :	15.00	15.00		56.690
	CUM GPA : 3.550	CUM TOTALS :	133.00	158.00		472.030

** Dean's List **

SPR 2013

Program : Engineering
Plan : Biomedical Engineering - BS Major

BME	4051L	BME Lab II	1.00	1.00	B	3.000
BME	4260	Eng Hemodynamics	3.00	3.00	B-	8.010
BME	4332	Cell Tissue Eng	3.00	3.00	A-	11.010
BME	4908	Senior Design Proj	3.00	3.00	A	12.000
IDH	4905	Honors Independ Stud		0.00	A	
IDH	4905	Honors Independ Stud		0.00	A	
	TERM GPA : 3.400	TERM TOTALS :	10.00	10.00		34.020
	CUM GPA : 3.540	CUM TOTALS :	143.00	168.00		506.050

Undergraduate Career Totals

CUM GPA : 3.540	CUM TOTALS :	143.00	168.00		506.050

- - - - - **Non-Course Milestones** - - - - -

Summer Enrollment Requirement - Completed
Milestone Status: Completed
Exempt with Test Credits
Foreign Language Requirement - Exempted - high school credit
Milestone Status: Completed
Satisfied with High School Course Work 00/00

UGRD and GRAD Record Unofficial

Name : Christopher Emerson
Student ID: 2986495
Address : 7421 SW 148th Street
Palmetto Bay, FL 33158-2142
United States
Print Date : 2015-07-03

- - - - - **Degrees Awarded** - - - - -

Degree : Bachelor of Science
Confer Date : 2013-04-27
Degree GPA : 3.540
Degree Honors : Cum Laude
Plan : Biomedical Engineering
Plan : Chemistry - Minor
Florida International University

- - - - - Beginning of Graduate Record - - - - -

FALL 2013

Program : Engineering
Plan : Materials Sci and Engr - MS Major

EGN	3321	Dynamics	3.00	3.00	A	
EMA	5106	Themo & Kine Of Mat	3.00	3.00	A-	11.010
EMA	5295	Princ Of Composites	3.00	3.00	A-	11.010
EMA	5507C	Analytical Tech	3.00	3.00	A-	11.010
EML	4930	Special Topics/Proj	3.00	3.00	A-	
	TERM GPA : 3.670	TERM TOTALS :	15.00	15.00		33.030
	CUM GPA : 3.670	CUM TOTALS :	15.00	15.00		33.030
	Good Standing					

SPR 2014

Program : Engineering
Plan : Materials Sci and Engr - MS Major

EGM	5354	Fem In Me	3.00	3.00	A	12.000
EMA	5001	Phys Prop Of Matls	3.00	3.00	A	12.000
EMA	5326	Corrosion Sci Eng	3.00	3.00	A	12.000
	TERM GPA : 4.000	TERM TOTALS :	9.00	9.00		36.000
	CUM GPA : 3.840	CUM TOTALS :	24.00	24.00		69.030
	Good Standing					

SUM 2014

Program : Engineering
Plan : Materials Sci and Engr - MS Major

EML	6971	Masters Thesis	3.00	3.00	P	
EMA	6518	Trans Elect Micro	3.00	3.00	A-	11.010
	TERM GPA : 3.670	TERM TOTALS :	6.00	6.00		11.010
	CUM GPA : 3.810	CUM TOTALS :	30.00	30.00		80.040
	Good Standing					

FALL 2014

Program : Engineering
Plan : Materials Sci and Engr - MS Major

EGM	6355	Nonlinear Fea	3.00	3.00	A	12.000
EML	6971	Masters Thesis	3.00	3.00	P	
	TERM GPA : 4.000	TERM TOTALS :	6.00	6.00		12.000
	CUM GPA : 3.840	CUM TOTALS :	36.00	36.00		92.040
	Good Standing					

SPR 2015

Program : Engineering
Plan : Materials Sci and Engr - MS Major

EML	6935	Graduate Seminar		0.00	P	
	Grading Basis: Pass/Fail					
EML	6971	Masters Thesis	1.00	1.00	P	

TERM GPA :	0.000	TERM TOTALS :	1.00	1.00	0.000
CUM GPA :	3.840	CUM TOTALS :	37.00	37.00	92.040

Good Standing

SUM 2015

Program : Engineering
Plan : Materials Sci and Engr - MS Major

EML	6971	Masters Thesis		1.00		
TERM GPA :	0.000	TERM TOTALS :	0.00	0.00	0.000
CUM GPA :	3.840	CUM TOTALS :	37.00	37.00	92.040

Graduate Career Totals

CUM GPA :	3.840	CUM TOTALS :	37.00	37.00	92.040

Return

FIU | Engineering and Computing
FLORIDA INTERNATIONAL UNIVERSITY

July 6, 2015

Graduating Student Award Committee
College of Engineering and Computing
Florida International University
Miami, FL, 33174

Ref: Nomination of Christopher Emerson as Outstanding Graduating Student (M.S.)

Dear Award Committee members,

I am pleased to nominate Mr. Christopher Emerson for the Outstanding Graduating Student (M.S.) in Materials Science and Engineering for the Summer 2015 ceremony.

Christopher started at FIU in the Chemistry and Biochemistry program and transferred to the BME program where he received his BS in Biomedical Engineering program in Spring 2013 while concurrently working in industry. He returned to FIU to start the MS program in Materials Science and Engineering in Fall 2013. He will be completing the requirements for the degree in Materials Science and Engineering in the Summer 2015, with a GPA of 3.83 under the tutelage of Prof. Kinzy Jones and Courtesy Professor Dr. Carlos Lavernia.

For his MS thesis, he worked on the analysis of explanted hip implants using XRD, SEM/EDS, and GAMRY Instruments working with Cobalt Chromium Molybdenum (CoCrMo) and Ti-6Al-4V alloys. He completed accelerated corrosion tests using open current potential and cyclic polarization. He also looked at the Finite Element Modeling of hip implant with Ansys. Because of their excellent mechanical, tribological, and electrochemical properties, Cobalt Chromium Molybdenum alloys have been used as the material for both the stem and head of modular hip implants. Corrosion is one mechanism by which metal debris, from these implants, is generated, which can lead to adverse events that requires revision surgery. Manufacturing process such as wrought, as-cast, and powder metallurgy influences the microstructure, material properties, and performance of these implants.

The current research focuses on analyzing the microstructure of CoCrMo alloys from retrieved hip implants with optical and scanning electron microscopy. Additionally, energy disperse spectroscopy was utilized to determine weight composition of cobalt, chromium, and molybdenum in solution. Potentiodynamic polarization was used as an accelerated corrosion testing method to determine the electrochemical behavior of the different microstructures. In agreement with prior literature, it was found that Low Carbon Wrought CoCrMo Alloys have the best corrosion resistance properties.

He has submitted two manuscripts as conference papers with Prof. Jones and Dr. Lavernia. He has made three presentations and has another in 2016. He has also gave two other presentations while at FIU but as an undergraduate in the BME and Chemistry and Biochemistry Departments.

Beyond his research work, he has been involved in various extracurricular activities. Since November 2013 has volunteered at Nicklaus Children's Hospital (formerly Miami Children's Hospital) and has accumulated over 400 volunteer hours in both the surgical care unit known as 2East and with the Pediatric Hospitalist Department. He also volunteers as a researcher with the Pediatric Hospitalist Department and the Department of Orthopedics.

He is implementing the Pediatric Hospitalist Choosing Wisely Campaign – on going project with the Children's' Hospital Association, Texas Children's Hospital and Nicklaus Children's Hospital. The goal is to devise an objection metric to measure how well children's hospitals through the United States adhere best practice standard of evidence-based medicine. From January 2014-May 2015, he has held a part time research associate position at the Arthritis Surgery Research Foundation, a non-profit research foundation affiliated with Larkin Community Hospital.

He has also mentored an undergraduate student, Daniel Pico of the Mechanical Engineering program.

As a result of his work and extracurricular activities, he has been accepted to three School of Medicine programs and will be heading to UM's Miami Miller School of Medicine to become an orthopedic surgeon.

Because of all these reasons, Christopher is a very strong candidate for the Outstanding MS graduate and I enthusiastically recommend and support his nomination.

Sincerely,

I. N. Tansel

Ibrahim N. Tansel, PhD, FASME
Professor and Interim Chair

Department of Mechanical and Materials Engineering
10555 West Flagler Street, EC3475, Miami, Florida 33174 • Tel: 305-348-2569 • Fax: 305-348-1932 • www.fiu.edu