

Cover Sheet: Request 9859

Biomaterials Certificate

Info

Process	Certificate New Ugrad/Pro
Status	Pending
Submitter	Nunez,Julissa jnunez@ufl.edu
Created	12/3/2014 12:25:34 PM
Updated	2/3/2015 10:19:01 AM
Description	The biomaterials certificate is awarded by the Materials and Science and Engineering Department (MSE) to emphasize a concentration in the area of biomedical materials. The Biomaterials certificate provides a foundation in the areas of biocompatibility, the biological performance of materials, and material design and selection for medical applications.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Materials Science and Engineering 011909000	Xue, Jiangeng		12/5/2014
College	Approved	ENG - College of Engineering	Caple, Elizabeth		1/28/2015
Office of Institutional Planning and Research	Approved	PV - Office of Institutional Planning and Research	Zeglen, Marie	I approve CIP 14.1801 for the Biomaterials certificate.	2/3/2015
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			2/3/2015
Office of the Registrar					
OIPR Notified					
Student Academic Support System					
Catalog					
Academic Assessment Committee Notified					
College Notified					

This form may be used to propose a new certificate. Instructions for completing and submitting this form are on the last page.

Proposed Certificate

1. Certificate Name Biomaterials
2. Transcript Title (maximum 50 characters) Biomaterials
3. Amount of Credit 10
4. Level ☒ Baccalaureate ☐ Graduate ☐ Professional
5. CIP Code 14.1801 6. Degree Name BS in Materials Science and Engineering
7. Effective Term Fall/2015

8. Certificate Description (50 words or less)

The biomaterials certificate is awarded by the Materials and Science and Engineering Department (MSE) to emphasize a concentration in the area of biomedical materials. The Biomaterials certificate provides a foundation in the areas of biocompatibility, the biological performance of materials, and material design and selection for medical applications.

9. Requirements

EMA4061 – Introduction to Biomaterials 1, EMA4062 – Introduction to Biomaterials 2, EMA4161 – Physical Properties of Polymers, and EMA4XXXL – Biomaterials Laboratory

10. Prerequisites

CHM2045 – General Chemistry 1 or CHM2095 – Chemistry for Engineers 1, CHM2046 – General Chemistry 2 or CHM2096 – Chemistry for Engineers 2, EMA3010 – Materials, EMA3011 – Fundamental Principles of Materials or CHM2200 Fundamentals of Organic Chemistry or CHM2210 – Organic Chemistry 1, and EMA3066 – Introduction to Organic Materials

11. Rationale and Place in Curriculum

This will be a certificate available to undergraduate students both within and outside of the Materials Science and Engineering bachelor's degree program. Certificates will provide students the opportunity to specialize in one materials area they are particularly interested in and obtain a beneficial addition to their transcripts and/or CV.

12. Student Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering to materials systems
- EMA4061, EMA4161, & EMA4XXXL
- Exam & Lab Assignments – Assessed by Single Faculty Member
2. Ability to conduct experiments, analyze and interpret data.
- EMA4061 & EMA4XXXL
- Exam & Lab Assignments – Assessed by Single Faculty Member
4. Ability to apply and integrate knowledge of structure, properties, processing, and performance to solve materials selection and design problems within realistic constraints.
- EMA4061 & EMA4XXXL
- Exam & Lab Assignments – Assessed by Single Faculty Member
5. Ability to function on multi-disciplinary teams.
- EMA4XXXL
- Lab Assignments – Assessed by Single Faculty Member
6. Ability to identify, formulate, and solve engineering problems.

<p>- EMA4061, EMA4161, & EMA4XXXL</p> <p>- Exam & Lab Assignments – Assessed by Single Faculty Member</p> <p>7. Understanding of professional and ethical responsibility.</p> <p>- EMA4061 & EMA4XXXL</p> <p>- Exam & Lab Assignments – Assessed by Single Faculty Member</p> <p>8. Ability to communicate effectively in both oral and written form.</p> <p>- EMA4061 & EMA4XXXL</p> <p>- Exam & Lab Assignments – Assessed by Single Faculty Member</p> <p>11. Ability to engage in lifelong learning.</p> <p>- EMA4061 & EMA4XXXL</p> <p>- Exam & Lab Assignments – Assessed by Single Faculty Member</p> <p>13. Ability to use the techniques, skills, and tools needed for practice as a materials engineer.</p> <p>- EMA4061 & EMA4XXXL</p> <p>- Exam & Lab Assignments – Assessed by Single Faculty Member</p>

- Prepare a document showing the catalog-style description of the certificate, requirements for entry, requirements for completion, and a suggested semester-by-semester plan using a Word document.
- Prepare supporting documentation including memos, emails, etc. from other units to provide evidence of the availability of courses that are required for the certificate and/or to provide evidence for support of the proposed certificate if there is clear or potential overlap or duplication of content.

Instructions

This form may be used to propose a new undergraduate certificate.

1. Enter the name of the certificate. Example: Urban Pest Management.
2. Enter the transcript title of the certificate. This is limited to 50 characters, including spaces.
3. Enter the total number of credit hours needed to complete the certificate program.
4. Enter the program level of the certificate.
5. Enter the six digit Classification of Instructional Programs (CIP) code for the degree program associated with the proposed certificate. The code has the numerical format XX.XXXX. Contact the [Office of Institutional Planning and Research](#) (OIPR) to verify the CIP code for the existing degree program.
6. Enter the degree name associated with the CIP code entered above.
7. Enter the term (semester and year) that the certificate would start.
8. Enter a description of the certificate. This is limited to 50 words or less.
9. List the requirements of the certificate program, such as courses, internships, etc.
10. List any prerequisite requirements for this new certificate program such as courses, internships, volunteer hours, credit hours, or grade point average.
11. Describe the rationale for offering this new certificate and having it on the transcript, its place in the curriculum, how it will enhance the quality of the existing program or department. Also describe its overlap with any existing certificates and programs, and a justification for any such overlap.
12. List each student learning outcome with its associated courses, assessment type (e.g. course-related exam/assignment/grade, final paper/project/presentation, standardized exam, capstone) and method (e.g. rubric, faculty committee, single faculty member).

Biomaterials Certificate

Credits: 10, with minimum grades of C

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Prerequisite Courses

- CHM 2045 General Chemistry 1 or
CHM 2095 Chemistry for Engineers 1, both 3 credits
- CHM 2046 General Chemistry 2 or
CHM 2096 Chemistry for Engineers 2, both 3 credits
- EMA 3010 Materials, 3 credits
- EMA 3011 Fundamental Principles of Materials, or
CHM 2200 Fundamentals of Organic Chemistry, or
CHM 2210 Organic Chemistry 1, all 3 credits
- EMA 3066 Introduction to Organic Materials, 3 credits

Required Courses

- EMA 4061 Introduction to Biomaterials 1, 3 credits
- EMA 4062 Introduction to Biomaterials 2, 3 credits
- EMA 4161 Physical Properties of Polymers, 3 credits
- EMA 4xxxL Biomaterials Laboratory, 1 credit

Recommended Semester Plan

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. Students are required to complete HUM 2305

The Good Life (GE-H) in semester 1 or 2.

Semester 1

If you don't place out of ENC1101, take it in the fall

CHM2045 General Chemistry 1 (GE-P) **or** CHM2095 Chemistry for Engineers 1 (GE-P)

CHM2045L General Chemistry 1 Laboratory (GE-P)

MAC2311 Analytic Geometry and Calculus 1 (GE-M)

Humanities (GE-H)

Social and Behavioral Sciences (GE-S)

Credits

3

1

4

3

3

14 Total

Semester 2

CHM2046 General Chemistry 2 (GE-P) **or** CHM2096 Chemistry for Engineers 2 (GE-P)

Credits

3

CHM2046L General Chemistry 2 Laboratory (GE-P)	1
MAC2312 Analytic Geometry and Calculus 2 (GE-M)	4
ENC3246 Professional Communication for Engineers (GE-C)	3
HUM2305 What is the Good Life (GE-H)	3
	14 Total
Semester 3	Credits
MAC2313 Analytics Geometry and Calculus 3 (GE-M)	4
PHY2048 Physics with Calculus 1 (GE-P)	3
PHY2048L Physics with Calculus 1 Laboratory (GE-P)	1
EIN4354 Engineering Economy (3) or MAN3025 Principles of Management (4) or	3 or 4
MAR3023 Principles of Marketing (4)	3
EMA3010 Materials	2
Computer programming course (COP2271 or see advisor for approved list)	16 or 17 Total
Semester 4	Credits
EGM2511 Engineering Mechanics – Statics	3
EMA3011 Fundamental Principles of Materials	3
EMA3800 Error Analyses and Optimization Methodologies in Materials Research	3
EMA3XXXXL Sophomore Materials Lab	1
MAP 2302 Elementary Differential Equations	3
PHY2049 Physics with Calculus 2	3
PHY2049L Physics with Calculus 2 Laboratory	1
	17 Total
Semester 5	Credits
EEL3003 Elements of Electrical Engineering	3
Humanities (GE-H) or Social and Behavioral Sciences (GE-S)	3
Social and Behavioral Sciences (GE-S)	3
	9 Total
Semester 6	Credits
EGM3520 Mechanics of Materials	3
EMA3050 Introduction of Inorganic Materials	3
EMA3066 Introduction to Organic Materials	3
EMA3080C Materials Laboratory 1	2
EMA4314 Energetics and Kinetics in Materials Science	3
	14 Total
Semester 7	Credits
EMA3013C Materials Laboratory 2	2
EMA4313 Introduction to Electronic Materials	3
EMA3513C Analysis of the Structure of Materials	4
EMA4125 Transport Phenomena in Materials Processing	3
EMA4223 Mechanical Behavior of Materials	3
	15 Total
Semester 8	Credits
EMA4324 Stability of Materials	3
EMA4913 Research in Materials Science and Engineering 1 or	
EMA4915 Integ Prod/Proc Des 1	1 or 3
Technical Elective	3
EMA4061 Introduction to Biomaterials 1	3
EMA4161 Physical Properties of Polymers	3
EMA Senior Materials Lab Elective	1
	14 or 16 Total
Semester 9	Credits
EMA4121 Interfacial Engineering	3
EMA4714 Materials Selection and Failure Analysis	3
EMA4914 Research in Materials Science and Engineering 2 or	

EMA4916 Integ Prod/Proc Des 2
EMA4062 Introduction to Biomaterials 2

3
3
12 Total