

UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Michael Keefe
Phone number: x8009

Department: Mechanical Engineering

Email address: keefe@udel.edu

Action: Add Integrated Design minor within the College of Engineering

Effective term: 14F

Current degree _____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: _____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: *Integrated Design*
Proposed new name for revised or new major / minor / concentration / academic unit
(if applicable)

Revising or Deleting:

Undergraduate major / Concentration: _____
(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor: _____
(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change: _____
(**Must attach** your Graduate Program Policy Statement)

Graduate Program of Study: _____
(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration: _____

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations)?

(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter "None")

"None" - No New Courses: Minor will be comprised of existing courses

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: <http://www.ugs.udel.edu/gened/>

The *Integrated Design* minor supports a number of the General Education Goals as described below. Two organizing principles generally describe the minor. First, the values of the minor comprise collaboration, imagination and impact. And second, the structure of courses was organized around the core concepts of design thinking, design making and design impact. Across these six areas the goals are met in multiple ways.

Goal 2. The *Integrated Design* minor facilitates student's critical thinking and problem solving by emphasizing how student's approach challenges. Students will have an opportunity through various courses to explore problems in new ways by emphasizing and facilitating the imagination phase of innovation, using design thinking, and human centered approaches to find meaningful and innovative solutions.

Goal 3: The *Integrated Design* minor facilitates student's capacity to be able to work and learn both independently and collaboratively by connecting students of varied majors as group partners. Students will have to bring their expert knowledge from their field of study to the table and then work in a diverse group with students who may see the world in a different manner through a different set of lens.

Goal 4: The *Integrated Design* minor facilitates student's ability to engage questions of ethics and recognize responsibilities to self, community and society at large by having a core requirement to take a class from the category: **Design Impact**. Design influences how people see, behave, aspire, and make meaning. The *Integrated Design* minor builds on this awareness in order to realize the power and impact that design can have. Students will engage in mindful design projects that engage processes to produce sustainable, viable, and desirable innovation for the student's immediate world, local community and potentially even globally.

Goal 5: The *Integrated Design* minor enhances student's diversity of thinking by purposefully exposing them to multiple disciplines outside their major. Central to design thinking is cross-disciplinary collaboration and utilizing alternative perspectives in the process of designing and innovating. The minor strives to incorporate courses from the broadest range of possible fields.

Goal 6: The *Integrated Design* minor emphasizes all facets of problems solving, highlighting the intellectual curiosity representative of the understand phase of the process. Seeking innovation, the courses in the minor push curiosity, asking key questions, and seeking the deeper issues. Students develop confidence through engagement by being required to take at least one course from the **Design Making** category, working collaboratively to bring ideas to concrete fruition.

Goal 7: The *Integrated Design* minor helps students build a bridge from the academic to the real world. The design process through all phases incorporates interaction with the real world from gathering user-centered data to piloting prototypes. Many courses engage real world 'clients' in experiential projects to highlight course lessons. And the emphasis of design impact necessarily requires an integrated approach - solving real-world problems with multiple academic disciplines.

Goal 8: The *Integrated Design* minor expands student's understanding and appreciation of human creativity and diverse forms of aesthetic and intellectual expression by exposing students of different majors to design spaces and idea-generating processes from different fields of study. The spaces may look like machine shops, CAD labs, a news studio, or an art room. Normally exposure to such diverse design spaces would be enough to expand someone's understanding of creativity and how other fields of study do what they do. Students in the minor will engage in these learning spaces and go beyond simple understanding to a full appreciation of what it takes to be a sculptor, a mechanical engineer, or a computer scientist.

Anticipated Enrollment

We anticipate that 25 students will begin the minor in the first year following approval. We expect this number to grow to 50 students consistently enrolled in the minor, and 20 students will matriculate each year.

Identify other units affected by the proposed changes:

(Attach permission from the affected units. If no other unit is affected, enter "None")

Although housed in the College of Engineering, the Integrated Design minor is a multi-disciplinary joint effort.

The following departments will have courses included in this minor:

Art (ART)

Plant and Soil Sciences (PLSC)

Communications (COMM)

Computer Science (CISC)

Electrical & Computer Engineering (ELEG/CPEG)

Entrepreneurial Studies (ENTR)

Mechanical Engineering (MEEG)

Public Policy and Administration (UAPP & LEAD)

Supporting documentation from units attached.

Describe the rationale for the proposed program change(s):

(Explain your reasons for creating, revising, or deleting the curriculum or program.)

Integrated Design is being proposed as a minor in order to provide a comprehensive learning experience that highlights and implements the design process within and across disciplines. At the core of the design process is problem solving. This includes identifying issues and addressing them through an iterative process that leads to finding creative and successful solutions. Included are prototype building and evaluation with the goal of meeting user needs. This Integrative Design learning is especially important in today's world, as the complex problems we face require trans-disciplinary approaches and innovative thinking to bring about meaningful solutions.

The structure of the Integrated Design minor is three part: Design Thinking, Design Making, and Design Impact. All students will be required to enroll in ART 215, Seeing and Being. This course is a core experience to the minor, as it introduces all three components (thinking, making, impact) and provides the context for understanding the content of the minor. Students will select comprehensive core experiences in all three areas (described in detail below).

This minor provides students the opportunity to pursue design interests in multi-disciplinary contexts, yet complementing their major goals. It is anticipated that students from many majors will be interested in this experience, yet it is set up to be an immediate and obvious fit for students in Mechanical Engineering, Art, and other departments as listed above.

Students declaring the minor will be assigned an advisor from the pool of faculty associated with the Delaware Design Institute (ddi.udel.edu). Dr. Jenni Buckley will serve as the Mechanical Engineering Coordinator and general point of contact for interested students.

The minor comprises three core categories:

Design Thinking, Design Making, and Design Impact.

Design Thinking core comprises courses emphasizing ways of seeing, habits of mind, and processes of design and innovative problem solving. These courses provide a foundation in understanding the design framework and related fields.

Design Making core comprises courses that engage students in the hands-on facets of design. Studio and lab work, prototype building, and other experiential practices focused on “building to think” are the hallmark of these courses.

Design Impact core comprises courses examining, the relationship between design activities and the many very difficult, real-world problems that challenge individuals, communities, and the world. These courses seek to raise awareness and develop the tools of social innovation - utilizing design to make a positive difference.

Program Requirements:

(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.)

The minor requires eighteen credit hours. The three-credit course, ART 215, Seeing and Being, is required. Students then choose three credits from each of three core categories, Design Thinking, Design Making, and Design Impact. The remaining six credits may be from any category the student chooses. Courses must be selected from at least three different departments and only nine credits may be counted toward both a student’s major requirements, other minor, and the Integrated Design minor (i.e., “double-dip”). An advisor for this minor will be assigned to each student.

Required Course: ART 215 Seeing and Being

Introduces visual literacy, design thinking, problem solving processes, and places design within a broader societal context. All students complete a team project that demonstrates the three core design concepts: Thinking, Making, and Impact.

Design Thinking: core comprises courses emphasizing ways of seeing, habits of mind, and processes of design and innovative problem solving. These courses provide a foundation in understanding design frameworks within related fields, and in developing approaches to knowledge building that link problem solving, user needs, and innovation.

- ART 129 Design and the Visual Arts
- ART 204 Media, Design, Culture
- CISC 101 Principles of Computing
- ENTR 350 Introduction to Entrepreneurship
- LEAD 300 Leadership Creativity and Innovation
- MEEG 202 Computer Aided Engineering and Design
- PLSC 103 Field Sketching
- PLSC 232 Basic Landscape Design
- PLSC 408 Advanced Landscape Design

Design Making: core comprises courses that engage students in the hands-on facets of design. Studio and lab work, prototype building, and other experiential practices focused on “building to think” are the hallmark of these courses. (Note that some of these courses would be specific to certain majors.)

- ART 180 Photographic Approaches
- ART 231 Introduction to Painting
- ART 243 Introduction to Print Making
- ART 250 Introduction to Sculpture

ART 280 Introduction to Photo and Video
 ART 290 Introduction to Ceramics
 CISC 106 General Computer Science for Engineers
 CISC 275 Introduction to Software Engineering
 COMM 324 Electronic Media Production
 COMM 325 Studio Television Production
 ENTR 352 Business Launch Pad
 MEEG 304 Junior Design II
 PLSC 301 Technology for Landscape Designers
 PLSC 330 Construction Materials
 UAPP 406 Planning Sustainable Communities
 UAPP 418 Traditional Architectural Materials

Design Impact: core comprises courses examining, and perhaps acting upon, the relationship between design activities and the many very difficult, real-world problems that challenge individuals, communities, and the world. These courses seek to raise awareness and develop the tools of social innovation - utilizing design to make a positive difference. (Note that some of these courses would be specific to certain majors.)

ART 400 Visual Communications Practicum
 CISC 374 Educational Game Design
 CPEG 498 or ELEG 498 Senior Design I
 CPEG 499 or ELEG 499 Senior Design II
 ENTR 455 Start-up Experience
 ENTR 456 Start-up Experience II
 LEAD 101 Global Contexts for Leadership
 LEAD 411 Topics in Leadership Dynamics
 MEEG 401 Senior Design
 PLSC 202 History of Landscape Design
 UAPP 420 Introduction to Photographing Historic Architecture
 UAPP429 Theory and Practice of Historical Preservation Planning
 UAPP430 Methods in Historic Preservation

All courses included in the minor must be completed with a grade of C- or better.
 Substitutions for the above courses may be made with permission of the program director.
 Independent studies and special problems courses may also count toward the minor with the director's approval.

ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson *[Signature]* Date 6 November 2013
 Dean of College *[Signature]* Date _____
 Chairperson, College Curriculum Committee *[Signature]* Date 12/4/13
 Chairperson, Senate Com. on UG or GR Studies _____ Date _____
 Chairperson, Senate Coordinating Com. _____ Date _____
 Secretary, Faculty Senate _____ Date _____
 Date of Senate Resolution _____ Date to be Effective _____
 Registrar _____ Program Code _____ Date _____
 Vice Provost for Academic Affairs & International Programs _____ Date _____
 Provost _____ Date _____
 Board of Trustee Notification _____ Date _____
 Revised 10/23/2007 /khs

Maccari, Crystal B.

From: Barner, Kenneth E.
Sent: Friday, December 06, 2013 8:46 AM
To: Maccari, Crystal B.
Cc: Advani, Suresh G; Keefe, Michael; Boncelet, Charles, JR
Subject: Integrated Minor

Suresh:

The ECE department approves the inclusion of ELEG/CPEG 498 and 499 in the list of Integrated Design Minor courses. Please let me know if I can provide any additional information on this issue.

Ken

Kenneth E. Barner
Professor & Chair
Department of Electrical and Computer Engineering
University of Delaware Newark, Delaware 19716
Phone: (302) 831-6937 Fax: (302) 831-4316
Email: barner@udel.edu Web: www.ece.udel.edu



School of Public Policy & Administration

INSTITUTE FOR PUBLIC ADMINISTRATION
CENTER FOR COMMUNITY RESEARCH & SERVICE
CENTER FOR HISTORIC ARCHITECTURE & DESIGN
CENTER FOR APPLIED DEMOGRAPHY & SURVEY RESEARCH

184 Graham Hall
Newark, DE 19716-7310
Phone: 302-831-1687
Fax: 302-831-3296
Email: sppa@udel.edu

TO: Michael Keefe
College of Engineering

FROM: Maria Aristigueta, Director *Maria P. Aristigueta*

DATE: November 26, 2013

SUBJECT: Letter of Support for proposed Integrated Design minor

I am pleased to offer my support to the proposed Integrated Design minor. The program sounds exciting and innovative.

From a School perspective, we are happy to have our classes included in the list of possible electives for students to fulfill their minor requirements:

LEAD 101	Global Contexts for Leadership
LEAD 300	Leadership, Creativity and Innovation
LEAD 411	Leadership Dynamics
UAPP 418	Traditional Architectural Materials

We do not have UAPP 404 in our inventory. UAPP 406 - Planning Sustainable Communities & Regions is in our inventory and is a course owned by Geography and taught by one of our faculty.

It is understood that SPPA is not the administrative home of the Integrated Design minor and is not responsible for the recruitment and advisement of students.



DEPARTMENT OF ART

University of Delaware
Newark, Delaware 19716-2511
PH: 302/831-2244

22 November 2013

Dear Colleagues:

The Department of Art supports the proposed minor in Integrated Design. The Art options outlined in the proposal are offered consistently and can accommodate students in the new minor, given currently existing registration restrictions.

The one required Art course, ART215: *Seeing and Being*, is slated to be offered fall semesters and will welcome Integrated Design students.

We appreciate the opportunity to collaborate on this interdisciplinary venture and look forward to its development.

Please let me know if you have questions or require further information. Thank you!

Sincerely,

A handwritten signature in black ink, appearing to read "René J. Marquez", with a stylized flourish at the end.

René J. Marquez
Associate Professor and Interim Chair

Dear Colleagues:

I am writing to give my full support to this proposal for an undergraduate Minor in Design, to be overseen by the Delaware Design Institute.

This minor would complement our existing curriculum in engineering design by giving our students more in-classroom and hands-on experience in industrial design, sustainable design, and leadership. This minor will also strengthen our undergraduate program and allow us to attract more top talent to the College of Engineering.

As a pilot test, we will begin by offering courses in Mechanical Engineering as part of this minor. We anticipate that other departments in the college will soon encourage their students to also pursue this minor and add course offerings.

This proposal for a new Minor in Design has my full support. Please feel free to contact me if you have any questions.

Sincerely,

Babatunde A. Ogunnaike, PhD
Professor & Dean
College of Engineering



College of Engineering

DEPARTMENT OF MECHANICAL
ENGINEERING

126 Spencer Laboratory
Newark, DE 19716
Phone: 302.831.2421
Fax: 302.831.3619
Email: info@me.udel.edu

March 8th, 2013

Dr. Ann Ardis, Deputy Provost
University of Delaware

Dear Dr. Ardis:

I write to offer my full support to the Delaware Design Institute (DDI). The Department of Mechanical Engineering has been involved in the planning of the DDI for several years, and two of our faculty members, Dr. Jenni Buckley and Dr. Mike Keefe, serve on the Steering Committee. Through the DDI, we have also partnered with faculty and students in the Departments of Art, Communications, and Public Policy on student projects and curriculum over the past two years. Our interactions with DDI have been greatly beneficial for our faculty and students, and we would like to see them expand in the coming years.

It is my opinion that the Department of Mechanical Engineering stands to benefit directly from the expansion of DDI's programmatic efforts and infrastructure. Specifically, many of our undergraduate students and industry partners have an expressed interest in industrial design - a discipline at the intersection of art and engineering - which is currently not taught as part of any engineering or art curriculum. Also, faculty working in the area of industrial design - like Drs. Buckley, Keefe, and Glancey from our department - are concentrated in individual majors, with few opportunities to work with colleagues across disciplines. The DDI is positioned to address this gap in our undergraduate curriculum and faculty collaborations.

As a specific example, DDI's proposed Integrated Design Minor would allow undergraduates in our Mechanical Engineering program to gain exposure in 3-D modeling and graphic arts. We expect that this will be a popular minor for our students, as many of them are interested in commercial product design. Our design program in Mechanical Engineering is well known in the region, and the option for students to broaden their training with an integrated design minor would further strengthen the program and also make us unique in the region. We are in full support of this minor and are willing to oversee it within the Department of Mechanical Engineering.

In conclusion, I strongly support the DDI and hope that you will fund its expansion. The programming and centralization of resources related to design will directly benefit our students and faculty. I am pleased that my faculty members have been involved in planning this organization, and I support their continued involvement.

Sincerely,

Suresh Advani, PhD
Professor & Chair
jbuckley@udel.edu || 302-831-3460

RE: Proposal for Integrated Design Minor

Perse, Elizabeth M. [eperse@art-sci.udel.edu]

Sent: Monday, November 11, 2013 9:31 AM

To: Keefe, Michael

Cc: Reeser, Susan D. [reeser@art-sci.udel.edu]

Hello Michael,

I have looked over the proposed minor in Integrated Design, as has our Undergraduate Studies Committee. We endorse the interdisciplinary minor and agree to have two of our courses, COMM324 and COMM325, listed as electives in the minor.

By the way, our Department's name is Communication (no "s").

Elizabeth M. Perse
Professor and Chair
Department of Communication
University of Delaware
Newark, DE 19716
302.831.8041
www.udel.edu/communication

-----Original Message-----

From: Keefe, Michael [<mailto:keefe@UDel.Edu>]
Sent: Thursday, November 07, 2013 4:14 PM
To: Perse, Elizabeth M
Subject: Proposal for Integrated Design Minor

Dear Elizabeth Perse,

The Department of Mechanical Engineering, with support from the Delaware Design Institute, is proposing a new interdisciplinary minor in Integrated Design. Attached is the form we are sending through the approval process to the Faculty Senate. It provides the description and justification of the proposed minor.

Also attached is the list of courses from your department that we would like to be able to include as electives in this new minor.

This is a revised version of a proposal that was supported by your department last year; however, this proposal is being submitted through the Mechanical Engineering Department.

Would you be able to provide me with a letter of endorsement for this new minor and also permission to list the courses as approved electives? Please include any special comment on availability of the courses and any resource impacts. Send this letter by return email to Michael Keefe, keefe@UDel.Edu, (campus mail: Mechanical Engineering, Spencer Lab) by November 22 so it may be included with the proposal for review by the college committee.

Thank you,

Michael Keefe, Associate Professor Mechanical Engineering Janet Hethorn, Professor and Delaware Design Institute Director

From: Errol Lloyd [elloyd@UDel.Edu]
Sent: Friday, November 08, 2013 9:16 AM
To: Keefe, Michael
Subject: Re: Proposal for Integrated Design Minor

Michael,

I am fine with the idea and the list, but want to be sure that you are aware that 275 and 374 both have CISC220 as a prereq, which means that a student who takes CISC106 will then need to also take CISC181 and CISC220 before they can take 275 or 374. Of course, that's not a problem for CIS and ECEs since they take 181 and 220 anyway after their intro course of 106 or 108.

Errol

On Thu, Nov 7, 2013 at 4:16 PM, Keefe, Michael <keefe@udel.edu> wrote:
Dear Errol Lloyd,

The Department of Mechanical Engineering, with support from the Delaware Design Institute, is proposing a new interdisciplinary minor in Integrated Design. Attached is the form we are sending through the approval process to the Faculty Senate. It provides the description and justification of the proposed minor.

Also attached is the list of courses from your department that we would like to be able to include as electives in this new minor.

This is a revised version of a proposal that was supported by your department last year; however, this proposal is being submitted through the Mechanical Engineering Department.

Would you be able to provide me with a letter of endorsement for this new minor and also permission to list the courses as approved electives? Please include any special comment on availability of the courses and any resource impacts. Send this letter by return email to Michael Keefe, keefe@UDel.Edu, (campus mail: Mechanical Engineering, Spencer Lab) by November 22 so it may be included with the proposal for review by the college committee.

Thank you,

Michael Keefe, Associate Professor Mechanical Engineering
Janet Hethorn, Professor and Delaware Design Institute Director

To: Michael Keefe, Associate Professor Mechanical Engineering
Janet Hethorn, Professor and Delaware Design Institute Director

From: Errol Lloyd, Chair CIS *E.L. Lloyd*

Date: November 8, 2013

Subject: Support for the proposed Integrated Design Minor

The Department of Computer and Information Sciences enthusiastically supports both the proposal by the Department of Mechanical Engineering and the Delaware Design Institute for an Integrated Design Minor, and the inclusion of four of our courses as optional courses for the minor. For varied reasons as noted below, no additional resources will be required by CIS to accommodate students in the Interactive Design Minor who wish to take our courses as part of that minor:

CISC101 - This recently redesigned course is ideal in this role for non-engineers. It is accessible to students from a range of disciplines, and the course generally runs at 75 to 80% of capacity. This leaves room for up to 15 additional students per semester to take the course.

CISC106 – This course is taken by all engineers (other than those in CIS), along with students from Math and some other science disciplines. The Fall sections are generally full, but there are a few seats available in the Spring. Those should be enough to accommodate any non-engineering, non-science students who want to take the course as part of the Interactive Design Minor.

CISC275 would likely only be taken by CIS students. Since it's a required course in our majors, this would not present any enrollment issues.

CISC374 generally has some available seats.



College of Agriculture &
Natural Resources

DEPARTMENT OF PLANT & SOIL SCIENCES

Dr. Blake C. Meyers
Edward F. and Elizabeth
Goodman Rosenberg Professor
Chair of Department
153 Townsend Hall
Newark, DE 19716-2170
Phone: (302) 831-3418
Email: meyers@dbi.udel.edu

November 14, 2013

Dr. Michael Keefe, Associate Professor Mechanical Engineering
Dr. Janet Hethorn, Professor and Delaware Design Institute Director
University of Delaware
Newark, Delaware 19716

Dear Michael and Janet,

I am writing with my enthusiastic support for your proposed a new interdisciplinary minor in *Integrated Design* and I can affirm to the willingness of the faculty in my department to welcome the students in this minor into their classes. The topic is an excellent fit with our Landscape Design program, and thus I strongly endorse the proposal for this new minor and you have my permission to list the courses as approved electives. These courses are offered annually.

As you described, the relevant courses from my department and the areas in which they fit, are as follows:

- **Design Thinking:** PLSC 103 Field Sketching, PLSC 232 Basic Landscape Design, PLSC 408 Advanced Landscape Design
- **Design Making:** PLSC 301 Technology for Landscape Designers, PLSC 330 Construction Materials
- **Design Impact:** PLSC 202 History of Landscape Design

Please let me know if you need any more information, but note that you have my strong support for this minor. I

Sincerely,

A handwritten signature in cursive script, appearing to read 'Blake C. Meyers'.

Blake C. Meyers, Ph.D.
Professor & Chair



Alfred Lerner College of Business & Economics

*Dr. Rick L. Andrews
Deputy Dean and Professor
Lerner College of Business & Economics
University of Delaware
Newark, DE 19716*

*Phone: (302) 831-1190
Fax: (302) 831-4196
Email: andrewsr@udel.edu
website: <http://www.buec.udel.edu/andrews/>*

Michael Keefe
Associate Professor of Mechanical Engineering
107 Spencer Laboratory
Newark, DE 19716

Janet Hethorn
Professor and Delaware Design Institute Director
104 Taylor Hall
Newark, DE 19716

November 16, 2013

Dear Professor Keefe and Professor Hethorn,

Thank you for your request to include four ENTR courses in the proposed curriculum for an Integrated Design minor. We have considered the resource implications of the request and are pleased to offer our support for the inclusion of the following courses:

ENTR 350 Introduction to Entrepreneurship
ENTR 352 Business Launch Pad
ENTR 455 Start-up Experience I
ENTR 456 Start-up Experience II

We look forward to being part of this exciting new program.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Dan Freeman'.

Dan Freeman
Director, Horn Program in Entrepreneurship

A handwritten signature in blue ink, appearing to read 'Rick L. Andrews'.

Rick L. Andrews
Deputy Dean