

# **Engineering Curriculum Handbook**

**2022-23 Edition**



**College of Engineering**

Revised 08/26/22

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# 1. Curriculum Contacts

## EFD CONTACTS

School	School Curriculum Chair	Undergraduate	Graduate
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## CURRENT ECC COMMITTEE MEMBERS

[https://engineering.purdue.edu/Engr/People/Committees/ptPeopleListing?group\\_id=22770](https://engineering.purdue.edu/Engr/People/Committees/ptPeopleListing?group_id=22770)

## **2. Curriculum Definitions**

### **1.1 MINOR**

A minor is defined to be a supplemental academic program of at least 15 and no more than 21 credit hours from a single or closely related subject areas.

- A minor should generally include at least 6 hours at the 30000 or higher level.
- The total number of credits required for the minor includes prerequisites for other courses in the minor beyond foundational courses in the University Core Curriculum.
- A minor can include University Core Curriculum courses from the home department. E.g., a minor in Psychology can include PSY 120.
  - The determination of 'closely related subject area' is made by reviewing the 'required major courses' for the related major. E.g., the major in statistics includes 42-46 credit hours of required major courses, drawing from courses in math or statistics. Thus, a minor in Statistics could draw from Math or Statistics.
- A student in a closely related major may not also enroll the minor.

### **1.2 CERTIFICATE**

A certificate is defined to be a supplemental academic program of at least 15 and no more than 21 credit hours that is by design multidisciplinary.

- A certificate should include at least 6 hours at the 30000 or higher level.
- The total number of credits required for the certificate includes prerequisites for other courses in the minor beyond foundational courses in the University Core Curriculum.
- Multidisciplinary means that the curriculum for a certificate must include courses from different subject areas that are not from 'closely related subject areas.'

### **1.3 CONCENTRATION**

A concentration is defined to be a specialization tied to a specific major of at least 9 hours.

### 3. Current College of Engineering Curriculum

The interactive degree maps for all undergraduate majors in the College of Engineering can be accessed here:

<https://engineering.purdue.edu/Engr/Academics/Undergraduate/Majors/index.html>.

These maps show the suggested course sequences over 8 semesters with pre- and co-requisites.

#### 2.1 AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

##### Undergraduate

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###### Major

- [Aeronautical and Astronautical Engineering, BS](#)

##### Graduate

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###### Doctoral

- [Aeronautics and Astronautics, PhD](#)

###### Master's

- [Aeronautics and Astronautics, MSAA](#)

#### 2.2 AGRICULTURAL AND BIOLOGICAL ENGINEERING

##### Undergraduate

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###### Major/Concentration

- [Agricultural Engineering, BS](#)
- [Environmental and Natural Resources Engineering, BS](#)
- [Biological Engineering, BS](#)
  - [Bioenvironmental Engineering](#)
  - [Cellular and Biomolecular Engineering](#)
  - [Food and Biological Process Engineering](#)
  - [Pharmaceutical Process Engineering](#)

###### Minor

- [Biotechnology](#)

##### Graduate

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###### Doctoral

- [Agricultural and Biological Engineering, PhD](#)

###### Master's

- [Agricultural and Biological Engineering, MS](#)
- [Agricultural and Biological Engineering, MSABE](#)
- [Agricultural and Biological Engineering, MSE](#)

#### Certificate

- [Hybrid Vehicle Systems](#)

## 2.3 BIOMEDICAL ENGINEERING

### Undergraduate

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#### Major

- [Biomedical Engineering, BS](#)

### Graduate

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#### Doctoral

- [Biomedical Engineering, PhD](#)

#### Master's

- [Biomedical Engineering, MS](#)
- [Biomedical Engineering, MSBME](#)

#### Certificate

- [Regulatory Affairs and Regulatory Science in Medical Devices](#)

## 2.4 CHEMICAL ENGINEERING

### Undergraduate

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#### Major

- [Chemical Engineering, BS](#)

### Graduate

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#### Doctoral

- [Chemical Engineering, PhD](#)

#### Master's/Concentration

- [Chemical Engineering, MSCHE](#)
  - [Data Science](#)

## 2.5 CIVIL ENGINEERING

### Undergraduate

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#### Major

- [Civil Engineering, BS](#)

#### Minor

- [Architectural Engineering](#)

### Graduate

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#### Doctoral/Concentration

- [Civil Engineering, PhD](#)

- [Geomatics Engineering](#)
- [Hydraulics and Hydrologic Engineering](#)

**Master's/Concentration**

- [Civil Engineering, MSCE](#)
  - [Geomatics Engineering](#)
  - [Structural Engineering](#)

## 2.6 CONSTRUCTION ENGINEERING AND MANAGEMENT

**Undergraduate**

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**Major**

- [Construction Engineering, BSCNE](#)

**Minor**

- [Construction Engineering](#)

## 2.7 ELECTRICAL AND COMPUTER ENGINEERING

**Undergraduate**

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**Major**

- [Computer Engineering, BSCMPE](#)
- [Electrical Engineering, BSEE](#)

**Minor**

- [Artificial Intelligence/Machine Learning](#)
- [Electrical and Computer Engineering](#)

**Graduate**

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**Doctoral/Concentration**

- [Electrical and Computer Engineering, PhD](#)
  - [Microelectronics and Advanced Semiconductors](#)

**Master's/Concentration**

- [Electrical and Computer Engineering, MSECE](#)
  - [Innovative Technologies](#)
  - [Microelectronics and Advanced Semiconductors](#)

**Certificate**

- [Hybrid Vehicle Systems](#)
- [Wireless Systems Engineering](#)

## 2.8 ENGINEERING ADMINISTRATION

**Undergraduate**

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**Minor**

- [Global Engineering Studies](#)
- [Innovation and Transformational Change](#)

## **Graduate**

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### **Master's**

- [Interdisciplinary Engineering, MS](#)
- [Interdisciplinary Engineering, MSE](#)

### **Certificate**

- [Applied Heat Transfer](#)
- [Digital Signal Processing](#)
- [Noise Control Engineering](#)

## **2.9 ENGINEERING EDUCATION**

### **Undergraduate**

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#### **Major**

- Interdisciplinary Engineering, BS
- Multidisciplinary Engineering, BSE

#### **Concentrations**

- |   |   |
|---|---|
| • <a href="#">Engineering Science Studies</a> | • <a href="#">Humanitarian Engineering</a>  |
| • <a href="#">Pre-Med</a>                     | • <a href="#">Lighting</a>                  |
| • <a href="#">Acoustical Engineering</a>      | • <a href="#">Nano Engineering</a>          |
| • <a href="#">Educational Engineering</a>     | • <a href="#">Theatre Engineering</a>       |
| • <a href="#">Engineering Management</a>      | • <a href="#">Visual Design Engineering</a> |
| • <a href="#">General Engineering</a>         |   |

### **Graduate**

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#### **Doctoral/Concentration**

- [Engineering Education, PhD](#)
  - [Computational Engineering](#)

#### **Master's/Concentration**

- [Engineering Education, MS](#)
- [Engineering Education, MSE](#)
- [Engineering Education, MENE](#)
  - [Computational Engineering](#)

#### **Certificate**

- [Teaching and Learning in Engineering](#)



## 2.10 ENVIRONMENTAL AND ECOLOGICAL ENGINEERING

### Undergraduate

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#### Major

- [Environmental and Ecological Engineering, BSEEE](#)

#### Minor

- [Environmental and Ecological Engineering](#)

### Graduate

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#### Doctoral

- [Environmental and Ecological Engineering, PHD](#)

#### Master's

- [Environmental and Ecological Engineering, MSEEE](#)

#### Certificate

- [Systems](#)

## 2.11 INDUSTRIAL ENGINEERING

### Undergraduate

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#### Major

- [Industrial Engineering, BSIE](#)

#### Minor

- [Manufacturing](#)

### Graduate

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#### Doctoral

- [Industrial Engineering, PhD](#)

#### Master's/Concentration

- [Industrial Engineering, MSIE](#)
  - [Professional Program in Industrial Engineering](#)

## 2.12 MATERIALS ENGINEERING

### Undergraduate

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#### Major

- [Materials Engineering, BSMSE](#)

#### Minor

- [Materials Science and Engineering](#)

### Graduate

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#### Doctoral

- [Materials Engineering, PhD](#)

#### Master's/Concentration

- [Materials Engineering, MSMSE](#)
  - [Professional Program in Materials Engineering](#)

## 2.13 MECHANICAL ENGINEERING

### Undergraduate

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#### Major

- [Mechanical Engineering, BSME](#)

#### Minor

- [Engineering and Public Policy](#)
- [Intellectual Property Law for Engineers](#)
- [Sustainable Engineering](#)

### Graduate

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#### Doctoral

- [Mechanical Engineering, PhD](#)

#### Master's

- [Mechanical Engineering, MSME](#)

#### Certificate

- [Hybrid Vehicle Systems](#)

## 2.14 NUCLEAR ENGINEERING

### Undergraduate

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#### Major

- [Nuclear Engineering, BSNE](#)

#### Minor

- [Nuclear Engineering](#)

### Graduate

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#### Doctoral

- [Nuclear Engineering, PhD](#)

#### Master's

- [Nuclear Engineering, MSNE](#)

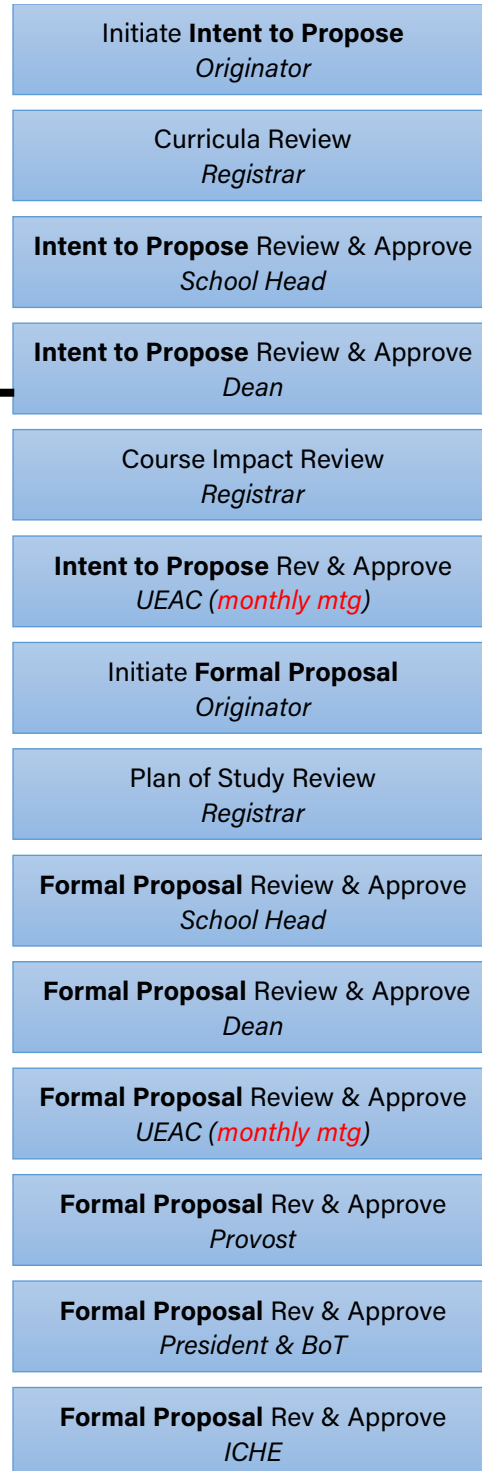
# 4. Curriculum Approval Process

## 4.1 UNDERGRADUATE

### College of Engineering Process



### UEAC Process



For more detailed information regarding the processes mentioned below, please see:

ECC - [Engineering Faculty Documents](#)

UEAC - [Appendix D](#)

## **5. Engineering Faculty Documents**

Approved via EFD 100-19 on February 18, 2019

The Engineering Curriculum Committee (ECC) has approved the following processing of Engineering Faculty Documents (EFD) in order to be consistent with the bylaws of the College of Engineering and with current University curricular practices. The intent of this update is to define, streamline, and clarify the processes for all curricular matters within the College. This EFD will replace EFD 07-06.

### **4.1 PURPOSE**

The Engineering Curriculum Committee is charged by the Dean of the College of Engineering with the study and review of curricular changes both undergraduate and graduate in the College of Engineering.

### **4.2 PROCESS OVERSIGHT**

The Office of the Associate Dean for Graduate and Undergraduate Education (AD) is responsible for the administrative oversight and the processing of all work stemming from the ECC.

### **4.3 ORIGINATION**

Engineering Faculty Documents can be proposed by any school, division, program, or administrative entity comprised primarily of faculty or with the approval of a curriculum committee consisting of faculty.

### **4.4 FORMAT**

Each proposed EFD shall conform to a format as outlined in the attached supplement. Required elements include: a document number (obtained from the Office of AD), the action requested, and an explanation of the proposed action.

### **4.5 TYPES OF ACTIONS**

Requested EFD actions fall into three types (see attached supplement)

#### **Auto-Approvals**

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Done by ECC chair without need for ECC review:

1. Online delivery of an existing course
2. Adding additional semester offering to an existing course

#### **Fast-Track**

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Examples of possible Fast-Track actions:

1. A change in prerequisites
2. A change in schedule type
3. A minor change in course description
4. A change in restrictions

5. A change in whether the course is repeatable or not-repeatable

## **Full Process**

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Examples of possible Full Process actions:

1. New course creation
2. Course expiration
3. Curricular updates (changes in plans of study)
4. Creation of new minors, majors, degrees, concentrations, and certificates
5. Course changes not listed under Auto-Approval or Fast-Track

## **4.6 PROCESSING**

1. All EFDs must be sent to the Office of the Associate Dean for Graduate and Undergraduate Education, which will begin the process by adding them to the EFD database.
2. EFDs will be considered at the next ECC meeting where a quorum is in attendance. A quorum is defined as a simple majority of the ECC.
3. **Auto-Approval EFDs** will be read into the minutes.
4. **Fast-Track EFDs** will first be reviewed by the ECC Chair and the Associate Dean. If both approve the EFD for fast-track, it will proceed to the ECC meeting. If they do not agree, the EFD will follow the Full Process. At the ECC meeting, a unanimous vote of the attending ECC members will approve the EFD on behalf of the faculty of the College of Engineering. If the vote is not unanimous, the EFD will follow the Full Process.
5. **Full Process EFDs** will be reviewed by the ECC and one of the following actions may occur:
  - a. The ECC votes to send the EFD to the faculty for review. The faculty has two weeks to review the EFD.
    - i. If member(s) of the faculty flag the EFD, the ECC Chair will work with the flagger and the originator to resolve the flag. If they cannot achieve a resolution within 30 days, the Chair may choose to hold an open faculty meeting to allow both parties to air their concerns. Following this meeting, the ECC may either pass the EFD with a 2/3 majority vote, or, reject it without prejudice.
    - ii. If the EFD is not flagged during the two-week period, it will be added to a consent agenda for approval on behalf of the faculty at the next subsequent ECC meeting. ECC members wishing to dissent should strive to notify the ECC Chair of their dissent before the meeting is held.
  - b. The ECC may choose to table the EFD for clarification and return it to the originator. The originator has 30 days to provide the clarification. If clarification is received, the EFD will return from the table for a vote. If the 30

days pass with no action, the ECC chair may choose to remove the EFD from the table to continue the process.

- c. The ECC does not vote to pass the EFD to faculty and rejects the EFD without prejudice

## 6. Appendix A: Course Requisite Change EFD Template



College of Engineering

Engineering Faculty Document

No.: [EFD #]

[Select date.]

**TO:** The Engineering Faculty

**FROM:** The Faculty of the [school or committee]

**RE:** Requisite Changes to [course number and title]

The Faculty of the [school or committee] has approved the following requisite changes to [choose course level] course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

### Requisite Change for [Course number and title]

Underline the changes to be made.

**FROM:**

[Click or tap here to enter text.]

**TO:**

[Click or tap here to enter text.]

**RATIONALE:**

[Click or tap here to enter text.]

---

Head/Director of the [school or committee]

Link to Curriculog entry:

[Paste link to Curriculog entry.]



## 7. Appendix B: New Course EFD Template



College of Engineering

Engineering Faculty Document

No.: [EFD #]

[Select date.]

**TO:** The Engineering Faculty

**FROM:** The Faculty of the [school or committee]

**RE:** New [choose course level] course – [course number and title]

The Faculty of the [school or committee] has approved the following new [choose course level] course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

**FROM (IF ALREADY OFFERED WITH TEMPORARY NUMBER):**

[Temporary Course Number and Title]

[Semesters offered]

[Total number of credits] total credits; [credits broken down by schedule type]

[Prerequisite(s)]

[Previous offerings with enrollment]

**TO:**

[New Course Number and Title]

[Semesters offered]

[Total number of credits] total credits; [credits broken down by schedule type]

[Prerequisite(s)]

[Course description]

**RATIONALE:**

[Click or tap here to enter text.]

---

Head/Director of the [school or committee]

Link to Curriculog entry: [Paste link to Curriculog entry.]

## 8. Appendix C: Curricular Change EFD Template



College of Engineering

Engineering Faculty Document

No.: [EFD #]

[Select date.]

**TO:** The Engineering Faculty

**FROM:** The Faculty of the [school or committee]

**RE:** New Engineering [choose program]

The Faculty of the [school or committee] has approved the following new [choose program] from the College of Engineering. This action is now submitted to the Engineering Faculty with a recommendation for approval.

**TITLE:**

[Click or tap here to enter text.]

**DESCRIPTION:**

[Click or tap here to enter text.]

**RATIONALE:**

[Click or tap here to enter text.]

---

Head/Director of the [school or committee]

Link to Curriculog entry:

[Paste link to Curriculog entry.]

## 9. Appendix D: UEAC Curriculum Processes

- [Undergraduate Curriculum Expiration](#)
- [Undergraduate Add Major, Minor, or Concentration to Existing Degree Program](#)
- [Undergraduate Addition of New Degree Program or Certificate](#)

### **Expire a Degree Program, Major, Minor, Concentration, or Certificate**

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Initiator begins request to expire:

1. Degree Program
2. Major
3. Minor
4. Concentration
5. Certificate

Initiator checks for enrolled students (Cognos report)

Verify with Admissions

1. Verify Admissions is not admitting to the program/major/etc. and it is not on the common application and no future admits
  - a. If Yes, a plan must be provided by academic unit for student's degree completion.

Initiator reviews:

1. Are there currently enrolled students?
  - a. Yes – are they staying under the existing?
    - i. No - have the students been notified? Will this change delay their graduation?
  - b. No – move forward

Initiator answers:

1. What is effective term
2. Brief rationale for revision

Department head will review

1. Approve - Proceed
2. Deny - Send back to initiator

Dean of School/College will review

1. Approve - Proceed
2. Deny - Send back to initiator

Notifications are sent to:

1. Office of the Registrar

2. Office of the Provost
3. Associate Deans

Office of the Provost approval

1. Approve – Provost Office submits to Office of the Registrar
2. Deny - Initiator must make changes according to the result

If expiring an entire program (the last major in a program)

1. Provost Office communicates with ICHE to remove the program from API

Office of the Registrar

1. SIS systems updated accordingly
2. Communicate to University stakeholders, including Admissions and Financial Aid

### **Add Major, Minor, or Concentration to Existing Degree Program**

---

Initiate Request to Plan Proposal

1. Include Rationale, projected headcount, draft of plan of study, effective term
2. Enrollment Management Analysis & Reporting (EMAR) provide feedback on projected headcount

Department Head approval to proceed

1. Approve - proceed
2. Deny - send back to initiator

Dean of School/College approval to proceed

1. Approve - proceed
2. Deny - send back to initiator

Notify Office of the Registrar

Notify Provost Office and Associate Deans for review intent to propose

Provost Office discuss intent with UEAC

1. Approve - proceed with request to submit proposal
2. Deny - send back to initiator

Initiate formal proposal

1. Include:
  - a. Plan of Study (Plan of Study for majors or concentrations, list of courses for minors)
  - b. 8-semester plan (degree requirement sheet)
  - c. Brief rationale for addition or revision

- d. List of pre-requisites for required courses
  - e. If courses are required from outside the proposing department or school, the departmental contact for use of those courses should be provided
  - f. Total number of credit hours
2. Are there currently enrolled students?
    - a. Are they staying under the existing?
      - i. If no, have the students been notified?
  3. Include CIP code

Notify Department head for review

1. Approve - Proceed
2. Deny - Send back to initiator

Notify Dean of School/College

1. Approve - Proceed
2. Deny - Send back to initiator

Submission to Office of the Registrar for review and recommendation

1. Review required courses and assess impact

Office of the Provost reviews formal proposal

Associate Deans review formal

1. If discussion is needed: Provost Office reviews with UEAC; no vote required

Notify Office of the Registrar

1. SIS systems updated accordingly
2. Communicate to University stakeholders, including Admissions and Financial Aid, etc.

## **New Degree Program or Certification**

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Initiate Request to Plan a Proposal

What is the request for?

1. Degree Program
2. New Certification

Information to include:

1. Rationale
2. Projected headcount
3. Critical courses
4. Effective term

Contact Enrollment Management Analysis and Reporting (EMAR) for assessment market demand

Department Head will review

1. Approve - proceed
2. Deny - send back to initiator

Dean of School/College will review

1. Approve - proceed
2. Deny - send back to initiator

Notifications sent to:

1. Office of the Registrar
2. Office of the Provost
3. Associate Deans

Office of the Provost will review with UEAC

1. Approve - proceed with request to submit proposal
2. Deny - initiator must make changes according to the result

Initiator processes the request for formal proposal

1. Should include supporting documentation:
  - a. Characteristics
  - b. Rationale
  - c. Assessment of need
  - d. Cost and support
  - e. Similar and related programs
  - f. Quality and other aspects
  - g. Plan of Study including 8-semester template
  - h. Projected headcount

Department Head approval

1. Approve - Send to the Dean of School/College for approval
2. Deny - Send back to initiator

Dean of School/College for approval

1. Approve - Send out notifications to Office of the Registrar
2. Deny - Send back to initiator

Notifications are sent to:

1. Office of the Registrar
2. Provost Office
3. Associate Deans

Office of the Provost will review and UAEC will provide an advisory note

1. Approve - Send to initiator for submission of formal proposal
2. Deny - Send back to initiator to make adjustments

Office of the Registrar reviews documents

1. Approve - Send official documentation to the Office of the Provost
2. Deny - Send back to initiator to make adjustments

Office of the Provost for reviews with UAEC (vote)

1. Approve - Send to President/Board of Trustees to add to the Board of Trustees agenda
2. Deny - Send back to department to make changes necessary

President/Board of Trustees review

1. Approve - Send to Provost Office to submit to ICHE
2. Deny - Send to initiator to make adjustments

ICHE - Indiana Commission for Higher Education

1. Approve - Approval letter will be sent to Provost Office
2. Deny - Send to Provost Office for action

Provost Office will provide approval letter from ICHE to Office of the Registrar

Office of the Registrar will:

1. SIS systems updated accordingly
2. Communicate to University stakeholders, including Admissions and Financial Aid