From:	noreply@wsu.edu
To:	curriculum.submit
Subject:	667543 Electrical Engineering and Computer Science Requirements Revise - Revise or Drop Graduate Plan
Date:	Friday, September 10, 2021 2:33:32 PM
Attachments:	2021.09.10.14.30.04.83.FormData.html 2021.09.10.14.30.03.61.currentCatalogFile_PhD_ECE.pdf 2021.09.10.14.30.03.61.currentCatalogFile1_Final_Draft__ECE_PhD_8.18.2021.pdf

Jessica Cross has submitted a request for a major curricular change. His/her email address is: j.cross@wsu.edu.

Requested change: Revise or Drop Graduate Plan

Degree: Ph.D. Electrical & Computer Engineering

Title: Ph.D. Electrical & Computer Engineering

Requested Effective Date: Fall 2022

Revise plan requirement: Yes

Dean: Field, David - Assoc Dean - VCEA - Grad,

Chair: Pande, Partha – Director – Electrical Engineering and Computer Science,

Catalog Subcommittee Approval Date	AAC, PHSC, or GSC Approval Date	Faculty Senate Approval Date

From: Pande, Partha Pratim
To: curriculum.submit
Cc: Field, Dave
Subject: Re: 667543 Electrical Engineering and Computer Science Requirements Revise - Revise or Drop Graduate Plan
Date: Friday, September 10, 2021 3:16:46 PM

I approve this proposal in its current form

Partha Pratim Pande, FIEEE
Director and Professor
Boeing Centennial Chair in Computer Engineering
School of EECS, WSU
PO BOX 642752
Pullman, Washington 99164-2752
Phone 509-335-5055 Fax 509-335-3818
pande@wsu.edu

From: curriculum.submit@wsu.edu <curriculum.submit@wsu.edu>
Date: Friday, September 10, 2021 at 2:30 PM
To: Pande, Partha Pratim <pande@wsu.edu>
Cc: Field, Dave <dfield@wsu.edu>
Subject: 667543 Electrical Engineering and Computer Science Requirements Revise - Revise or Drop Graduate Plan

Pande, Partha – Director – Electrical Engineering and Computer Science,

Field, David - Assoc Dean - VCEA - Grad,

Jessica Cross has submitted a request for a major curricular change.

Requested change: Revise or Drop Graduate Plan

Degree: Ph.D. Electrical & Computer Engineering

Title: Ph.D. Electrical & Computer Engineering

Requested Effective Date: Fall 2022

Revise plan requirement: Yes

Both Chair and Dean approval is required to complete the submission process. Please indicate that you have reviewed the proposal by highlighting one of the statements below and **reply all** to this email. (curriculum.submit@wsu.edu.) [Details of major change requested can be found in the attached supplemental documentation]

From: Field, Dave
To: Pande, Partha Pratim; curriculum.submit
Subject: Re: 667543 Electrical Engineering and Computer Science Requirements Revise - Revise or Drop Graduate Plan
Date: Friday, September 10, 2021 4:20:33 PM

I approve this proposal in its current form

From: Pande, Partha Pratim <pande@wsu.edu>
Sent: Friday, September 10, 2021 3:16 PM
To: curriculum.submit <curriculum.submit@wsu.edu>
Cc: Field, Dave <dfield@wsu.edu>
Subject: Re: 667543 Electrical Engineering and Computer Science Requirements Revise - Revise or Drop Graduate Plan

I approve this proposal in its current form

Partha Pratim Pande, FIEEE
Director and Professor
Boeing Centennial Chair in Computer Engineering
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Pullman, Washington 99164-2752
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pande@wsu.edu

From: curriculum.submit@wsu.edu <curriculum.submit@wsu.edu>
Date: Friday, September 10, 2021 at 2:30 PM
To: Pande, Partha Pratim <pande@wsu.edu>
Cc: Field, Dave <dfield@wsu.edu>
Subject: 667543 Electrical Engineering and Computer Science Requirements Revise - Revise or Drop Graduate Plan

Pande, Partha – Director – Electrical Engineering and Computer Science,

Field, David - Assoc Dean - VCEA - Grad,

Jessica Cross has submitted a request for a major curricular change.

Requested change: Revise or Drop Graduate Plan

Degree: Ph.D. Electrical & Computer Engineering

We are requesting to update the total graded credits required for the current Electrical & Computer Engineering Ph.D. program as well as the content of those required classes. The reduced overall number of credits allows students to focus more extensively on their research while still allowing them to take relevant classes prior to their qualifier and preliminary exams. This change will also put us in the range of required courses currently used by comparable programs in the U.S.

The change to the content of the required courses reflects updates to the course offerings that are available on the Pullman and Tri-Cities campuses which will better serve the availability of these courses to all students in the program. These courses also more directly guide students toward appropriate courses for their chosen focus areas within the degree.

Electrical and Computer Engineering PhD:

- ~~*Core: 3 course minimum:**~~
  - ~~CPT_S 516, CPT_S 555 or E_E 555**, CPT_S 561, E_E 501, E_E 503**, E_E 507, E_E 518, E_E 521, E_E 523, E_E 524, E_E 571, E_E 582, E_E 586, E_E 596~~
    ~~*Note: A grade of B or higher is required on all courses used for this requirement.~~
    ~~**Note: Only one course from E_E 503 and E_E 555 may count in this requirement.~~
- ~~*Minor Area – Systems:*~~
  - ~~Select 2 courses in consultation with your committee and pass each with a grade of B+ or higher.~~
- ~~*Minor Area – Power:*~~
  - ~~Select 2 courses in consultation with your committee and pass each with a grade of B+ or higher.~~
- ~~*Minor Area – Microelectronics:*~~
  - ~~Select 2 courses in consultation with your committee and pass each with a grade of B+ or higher.~~
- ~~*Minor Area – Electrophysics:*~~
  - ~~Select 2 courses in consultation with your committee and pass each with a grade of B+ or higher.~~
- ~~*Minor Area – Computer Engineering:*~~
  - ~~Select 2 courses in consultation with your committee and pass each with a grade of B+ or higher.~~
- Focus Areas:
  - Computer Engineering
    - Core Courses
      - Take at least two of the following courses; must be completed w/ B or better
        - E_E 524/CPT_S 561 – Advanced Computer Architecture
        - E_E 586 – VLSI Systems Design
          - NOTE: If E_E 586 is not available, E_E 466 (VLSI Design) may be substituted
        - E_E 587 - System on Chip Design and Test
          - NOTE: If E_E 587 is not available, E_E 434 (ASIC and Digital Systems Design) may be substituted
      - Take at least one additional course from the following list; must be completed w/ B or better
        - E_E 501 – Linear System Theory
        - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
        - E_E 507 – Random Processes in Engineering
        - E_E 518 – Advanced Electromagnetic Theory I
        - E_E 521 – Analysis of Power Systems
        - E_E 523 – Power Systems Stability & Control
        - E_E 524/CPT_S 561 – Advanced Computer Architecture
        - E_E 555 – Computer Communication Networks

        - E_E 571 – Advanced Wireless Integrated Circuits & Systems
        - E_E 582 – Advanced Topics: Cyber Security
        - E_E 586 – VLSI Systems Design
        - E_E 587 - System on Chip Design and Test
        - E_E 596 – Advanced Analog Integrated Circuits
        - CPT_S 516 – Algorithmics
- Electrophysics
    - Core Courses
        - Take at least two of the following courses; must be completed w/ B or better
            - E_E 518 – Advanced Electromagnetic Theory I
            - E_E 535 – Numerical Solutions to EM Problems
            - E_E 571 – Advanced Wireless Integrated Circuits & Systems
        - Take at least two additional courses from the following list; must be completed w/ B or better
            - E_E 501 – Linear System Theory
            - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
            - E_E 507 – Random Processes in Engineering
            - E_E 518 – Advanced Electromagnetic Theory I
            - E_E 521 – Analysis of Power Systems
            - E_E 523 – Power Systems Stability & Control
            - E_E 524/CPT_S 561 – Advanced Computer Architecture
            - E_E 535 – Numerical Solutions to EM Problems
            - E_E 555 – Computer Communication Networks
            - E_E 571 – Advanced Wireless Integrated Circuits & Systems
            - E_E 582 – Advanced Topics: Cyber Security
            - E_E 586 – VLSI Systems Design
            - E_E 587 – System on Chip Design and Test
            - E_E 596 – Advanced Analog Integrated Circuits
        - Any further courses as determined by your committee chair/faculty
- Microelectronics
    - Core Courses
        - The following courses must be taken at WSU (cannot be transferred in) and must be completed with a B or better
            - E_E 571 – Advanced Wireless Integrated Circuits & Systems
            - E_E 596 – Advanced Analog Integrated Circuits
- Power
    - Core Courses
        - The following courses must be taken at WSU (cannot be transferred in) and must be completed with a B or better
            - E_E 521 – Analysis of Power Systems
            - E_E 523 – Power Systems Stability & Control OR E_E 582 Cyber-Power Systems
            - One additional 500-level course in the Power area

        - One additional core course from another focus area (not in Power)
- Systems
    - Core Courses
        - The following courses must be taken at WSU (cannot be transferred in) and must be completed with a B or better
            - Systems Core
                - E_E 501 – Linear System Theory
                - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
                - E_E 507 – Random Processes in Engineering
        - Minor Areas – two 500-level courses in a breadth area, must be completed with a B or better:
            - Power
                - E_E 521
                - E_E 523
            - Microelectronics
                - E_E 571
                - E_E 576
            - Electrophysics
                - E_E 518
                - E_E 535
            - Computer Engineering (any two of the following)
                - E_E 524/CPT_S 561
                - E_E 586
                - E_E 587
            - Computer Science (any two of the following)
                - CPT_S 534 – Neural Network Design & Application
                - CPT_S 540 – Artificial Intelligence
                - CPT_S 570 – Machine Learning
                - CPT_S 577 – Structured Prediction
                - CPT_S 415 – Big Data
                - CPT_S 571 – Computation Genomics
                - CPT_S 575 – Data Science
                - CPT_S 580 – Special topics on Data Science related topics
                - CPT_S 591 – Elements of Network Science
                - CPT_S 411 – Introduction to Parallel Computing
                - CPT_S 483 – Special topics course (Intro to Compilers & LLVM)
                - CPT_S 527 – Computer Security
                - CPT_S 542 – Computer Graphics
                - CPT_S 561 – Computer Architecture
                - CPT_S 566 – Embedded Systems
                - CPT_S 580 – Advanced GPU Programming and other topics related to topics in computer systems

        - CPT_S 484 – Software Requirements
        - CPT_S 543 – Human-Computer Interaction
        - CPT_S 580 – Special topics on Software Engineering topics
        - CPT_S 581 – Software Maintenance
        - CPT_S 582 – Software Testing
        - CPT_S 583 – Software Quality
        - CPT_S 587 – Software Design & Architecture
    - One additional 500-level course from the following list or the previous breadth areas, must be completed with B or better. This course cannot be used to fulfill a previously listed requirement.
        - E_E 501 – Linear System Theory
        - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
        - E_E 507 – Random Processes in Engineering
        - E_E 518 – Advanced Electromagnetic Theory I
        - E_E 521 – Analysis of Power Systems
        - E_E 523 – Power Systems Stability & Control
        - E_E 524/CPT_S 561 – Advanced Computer Architecture
        - E_E 555 – Computer Communication Networks
        - E_E 571 – Advanced Wireless Integrated Circuits & Systems
        - E_E 582 – Advanced Topics: Cyber Security
        - E_E 586 – VLSI Systems Design
        - E_E 587 - System on Chip Design and Test
        - E_E 596 – Advanced Analog Integrated Circuits
        - CPT_S 516 – Algorithmics
    - One additional 500-level Systems course, must be completed with B or better.
    - Two additional 3 credit courses, which may be any combination of 5xx, 4xx, or 595, must be completed with B or better.
- *Research Credits: ~~30~~ 42 credits minimum:*
    - E_E 800
- *Total Graded Credits: ~~34~~ 24 credits minimum*
- *Total Credits: 72 credits minimum*

**Note: A grade of B grade or higher is required on all graded courses*

Applicable Graduate School Requirements:

- *Graded Credits: 34 credits*
- *Research Credits: 20 credits*
    - E_E 800
- *Total Credits: 72 minimum*

Hi Praveen,

They are meant to just be minimums for the degree requirements, so students could do more graded courses or more research credits as desired to reach the Grad School requirement of 72. Please let me know if this is something we will need to update.

Thank you!

On behalf of the catalog subcommittee, i am reviewing the request for updating the total graded credits for PhD CS and EE programs.
I see you are increasing the research credits from 30 to 42 minimum towards thesis and decreasing graded credits from 34 to 24 minimum (approx 8 courses).

But, the total of 42+24 = 66 minimum does not add upto 72. Am i missing something?

Regards,

Praveen