Hi Doug,

The ECpE Curriculum Committee is fine with these suggested graduate specializations, as we have already been organizing our graduate recruiting and qualifying processes using these academic areas for a number of years.

Can you forward this on to the ECCC for approval? I am not sure of their contact email.

Joe

From: Ross, Stacey R [E CPE]
Sent: Thursday, September 15, 2016 11:51 AM
To: Zambreno, Joseph [E CPE]
Cc: Thorland-Oster, Vicky L [E CPE]; Qiao, Daji [E CPE]
Subject: item for the curriculum committee
Importance: High

Hi Joe,

Here is an item for review by the ECpE Curriculum Committee. The Graduate College has asked us to set up our department's research areas as specializations. This is needed so we can list the specializations on the graduate application form, which will allow future admissions review data systems to sort applicants by their preferred areas of specialization.

Below, I have included the email conversation that got us to this point. Here, I have copied Judy Strand's instructions for routing the Request for Specialization forms (I am here initiating Step 2).

1. Complete the form on the Graduate College website • Proposal Instructions for Adding New or Changing an Area of Specialization in a Graduate Degree
2. Obtain approval from the department curriculum committee.
3. Obtain approval from the college curriculum committee.
4. Submit request to Graduate Catalog and Curriculum Committee - GCCC (Judy Strand, jstrand@iastate.edu). Once approved by the GCCC, it will go to the Graduate Council and Graduate Dean for approval.

I welcome any questions or concerns you may have.

Stacey Ross

Electrical and Computer Engineering | 1212 Coover Hall | 2520 Osborn Drive | Iowa State University | Ames, IA 50011-1046 USA | 1.515.294.9162

Yes…..final ECCC vote came in early this morning making it 8-Yes and 0-No….have a great rest of your day Stacey ☺

Paul

Paul S. Castleberry Ph.D.

Classification Officer College of Engineering

Iowa State University

Phone: (515)294-0364

Email: paulca@iastate.edu

Web: http://www.engineering.iastate.edu/classification/

"Without consultation, plans are frustrated,
but with many counselors they succeed."
Proverbs 15:22

From: Ross, Stacey R [E CPE]
Sent: Wednesday, September 28, 2016 12:06 PM
To: Castleberry, Paul S [ENGSS] <paulca@iastate.edu>
Subject: RE: FW: item for the curriculum committee

How about now?
Stacey :)

From: Castleberry, Paul S [ENGSS]
Sent: Thursday, September 22, 2016 11:28 AM
To: Ross, Stacey R [E CPE] <staceyr@iastate.edu>
Subject: RE: FW: item for the curriculum committee

Good Thursday Morning Stacy….just waiting on one more vote….just sent the ECCC member a reminder…..so far 7-Yes and 0-No's

Take care,
Paul

Paul S. Castleberry Ph.D.

Classification Officer College of Engineering

Iowa State University

Phone: (515)294-0364

Email: paulca@iastate.edu

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1. Name of the area of specialization.
Bioengineering
2. Name of the major.
Electrical Engineering
3. Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4. Name of the department(s) or program.
Department: Electrical and Computer Engineering
5. What is the change you are requesting? (Answer only if you checked the Change box)

6. Other existing areas of specialization for the same major and same degree.
Proposed: Communications and Signal Processing
Proposed: Electric Power and Energy Systems
Proposed: Electromagnetics, Microwave, and Nondestructive Evaluation
Proposed: Microelectronics and Photonics
Proposed: Systems and Controls
Proposed: VLSI
7. Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8. Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9. Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10. Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11 What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
T. Bigelow, J. Dickerson, L. Dong, J. Kim (group chair), M. Lu, S. Pandey, L. Que, N. Vaswani
CprE 567, CprE 570, EE 538, BME/EE 450X, EE 530M, PHYS 532, PHYS 461, BIOL 444
12. What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1.   Name of the area of specialization.
Communications and Signal Processing
2.   Name of the major.
Electrical Engineering
3.   Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4.   Name of the department(s) or program.
Department: Electrical and Computer Engineering
5.   What is the change you are requesting? (Answer only if you checked the Change box)

6.   Other existing areas of specialization for the same major and same degree.
Proposed: Bioengineering
Proposed: Electric Power and Energy Systems
Proposed: Electromagnetics, Microwave, and Nondestructive Evaluation
Proposed: Microelectronics and Photonics
Proposed: Systems and Controls
Proposed: VLSI
7.   Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8.   Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9.   Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10.   Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11   What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
G. Amariucai, J. Dickerson, A. Dogandzic, C. Hegde, A. Kamal, S.W. Kim, N. Neihart, J. Newman, A. Ramamoorthy, N. Vaswani (group chair), Z. Wang
EE 520, EE 521, EE 522X, EE 524, EE 525X, EE 527, EE 528, EE 545, EE 547, EE 573, EE 621, EE 622
12.   What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1.   Name of the area of specialization.
Electric Power and Energy Systems
2.   Name of the major.
Electrical Engineering
3.   Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4.   Name of the department(s) or program.
Department: Electrical and Computer Engineering
5.   What is the change you are requesting? (Answer only if you checked the Change box)

6.   Other existing areas of specialization for the same major and same degree.
Proposed: Bioengineering
Proposed: Communications and Signal Processing
Proposed: Electromagnetics, Microwave, and Nondestructive Evaluation
Proposed: Microelectronics and Photonics
Proposed: Systems and Controls
Proposed: VLSI
7.   Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8.   Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9.   Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10.   Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11   What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
V. Ajjarapu, I. Dobson (group chair), M. Govindarasu, A. Kimber, J. McCalley, L. Tesfatsion, U. Vaidya, L. Wang, Z. Wang
EE 552, EE 553, EE 554, EE 559, EE 653
12.   What future financial support will be needed? (For new specialization only.)   **As this specialization has existed informally, no new financial support is sought with this request.**

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1. Name of the area of specialization.
Electromagnetics, Microwave, and Nondestructive Evaluation
2. Name of the major.
Electrical Engineering
3. Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4. Name of the department(s) or program.
Department: Electrical and Computer Engineering
5. What is the change you are requesting? (Answer only if you checked the Change box)

6. Other existing areas of specialization for the same major and same degree.
Proposed: Bioengineering
Proposed: Communications and Signal Processing
Proposed: Electric Power and Energy Systems
Proposed: Microelectronics and Photonics
Proposed: Systems and Controls
Proposed: VLSI
7. Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8. Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9. Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10. Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11 What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
J. Bowler, N. Bowler, B. Hornbuckle (Agronomy Dept.), D. Jiles, M. Mina, N. Neihart, J. Song (group chair), C. Soukoulis (Physics Dept.)
EE 510, EE 511, EE 512, EE 513, EE 514, EE 516, EE 517, EE 518, EE 519, EE 538, EE 539/537X, EE 588
12. What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1. Name of the area of specialization.
Microelectronics and Photonics
2. Name of the major.
Electrical Engineering
3. Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4. Name of the department(s) or program.
Department: Electrical and Computer Engineering
5. What is the change you are requesting? (Answer only if you checked the Change box)

6. Other existing areas of specialization for the same major and same degree.
Proposed: Communications and Signal Processing
Proposed: Electric Power and Energy Systems
Proposed: Electromagnetics, Microwave, and Nondestructive Evaluation
Proposed: Bioengineering
Proposed: Systems and Controls
Proposed: VLSI
7. Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8. Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9. Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10. Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11 What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
R. Biswas, V. Dalal, J. Kim, S. Pandey (group chair), J. Shinar, R. Shinar, J. Song, G. Tuttle
EE532, EE 535, EE 536, EE 538
12. What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1. Name of the area of specialization.
Systems and Controls
2. Name of the major.
Electrical Engineering
3. Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4. Name of the department(s) or program.
Department: Electrical and Computer Engineering
5. What is the change you are requesting? (Answer only if you checked the Change box)

6. Other existing areas of specialization for the same major and same degree.
Proposed: Bioengineering
Proposed: Communications and Signal Processing
Proposed: Electric Power and Energy Systems
Proposed: Electromagnetics, Microwave, and Nondestructive Evaluation
Proposed: Microelectronics and Photonics
Proposed: VLSI
7. Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8. Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9. Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10. Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11 What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
V. Ajjarapu, D. Chen, I. Dobson, N. Elia, R. Kumar, J. McCalley, A. Stoytchev, U. Vaidya (group chair), Z. Wang
EE 565, EE 566, EE 571, EE 574, EE 575, EE 576, EE 577, EE 578
12. What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1.   Name of the area of specialization.
VLSI
2.   Name of the major.
Both: Computer Engineering and Electrical Engineering
3.   Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4.   Name of the department(s) or program.
Department: Electrical and Computer Engineering
5.   What is the change you are requesting? (Answer only if you checked the Change box)

6.   Other existing areas of specialization for the same major and same degree.
Proposed: Bioengineering   **Proposed: Computing and Networking Systems**
Proposed: Communications and Signal Processing   **Proposed: Secure and Reliable Computing**
Proposed: Electric Power and Energy Systems   **Proposed: Software Systems**
Proposed: Electromagnetics, Microwave, and Nondestructive Evaluation
Proposed: Microelectronics and Photonics
Proposed: Systems and Controls
7.   Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8.   Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9.   Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10.   Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11   What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
D. Chen (group chair), C. Chu, R. Geiger, N. Neihart, S. Pandey, A. Tyagi
CprE/EE 435, CprE/EE 465, CprE/EE 501, CprE/EE 504, CprE/EE 505, CprE/EE 506, CprE/EE 507, CprE/EE 508, CprE/EE 509X, EE 514, CprE 564, CprE 566
12.   What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1.   Name of the area of specialization.
Computing and Networking Systems
2.   Name of the major.
Computer Engineering
3.   Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4.   Name of the department(s) or program.
Department: Electrical and Computer Engineering
5.   What is the change you are requesting? (Answer only if you checked the Change box)

6.   Other existing areas of specialization for the same major and same degree.
Proposed: Secure and Reliable Computing
Proposed: Software Systems
Proposed: VLSI
7.   Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8.   Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9.   Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10.   Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11   What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
C. Chu, N. Gong, M. Govindarasu, Y. Guan, D. Jacobson, P. Jones (group chair), A. Kamal, S.W. Kim, S. Ponpandi, D. Qiao, D. Rover, A. Somani, S. Tirthapura, A. Tyagi, Z. Wang, J. Zambreno
CprE 525, CprE 526, CprE 541, CprE 542, CprE 543, CprE 545, CprE 546, CprE 547, CprE 550, CprE 558, CprE 581, CprE 582, CprE 583, CprE 584, CprE 588, CprE 681
12.   What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐ **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1. Name of the area of specialization.
Secure and Reliable Computing
2. Name of the major.
Computer Engineering
3. Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4. Name of the department(s) or program.
Department: Electrical and Computer Engineering
5. What is the change you are requesting? (Answer only if you checked the Change box)

6. Other existing areas of specialization for the same major and same degree.
Proposed: Computing and Networking Systems
Proposed: Software Systems
Proposed: VLSI
7. Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8. Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9. Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10. Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11 What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
T. Daniels, J. Davis, N. Gong, M. Govindarasu, Y. Guan, D. Jacobson, A. Kamal, S. Kothari, J. Newman, D. Qiao, J. Rursch, A. Tyagi, J. Zambreno
CprE 530, CprE 531, CprE 532, CprE 535, CprE 536, CprE 537, CprE 539
12. What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request.

Program Procedures for Obtaining Approval of a New Area of Specialization or a Change in an Area of Specialization in a Graduate Degree

(Check one)

X Request for New Specialization

☐   **Request for Change in Specialization**

The following describes the material which should be included in a proposal for a new area of specialization in an existing graduate degree or for a change in an existing area of specialization. Areas of specialization are recognized on a student's permanent record (transcript). Approval is required by the department or program curriculum committee, the College Curriculum Committee, the GCCC, Graduate Council, and by the Graduate Dean. The proposal should be sent to the Graduate Curriculum and Catalog Committee (GCCC) with documentation of approvals by the department and college:

> Graduate Curriculum and Catalog Committee
> 1137 Pearson Hall
> Iowa State University
> Ames, IA 50011-2206

1.   Name of the area of specialization.
Software Systems
2.   Name of the major.
Computer Engineering
3.   Graduate degrees to which it applies.
Both: Master of Science and Doctoral
4.   Name of the department(s) or program.
Department: Electrical and Computer Engineering
5.   What is the change you are requesting? (Answer only if you checked the Change box)

6.   Other existing areas of specialization for the same major and same degree.
Proposed: Computing and Networking Systems
Proposed: Secure and Reliable Computing
Proposed: VLSI
7.   Are areas of specialization optional or required? (Can a student choose the major without selecting an area of specialization?)
Required
8.   Reasons for proposing the new area of specialization or change in the area of specialization.
This area of specialization has been used informally within the department for many years.
9.   Requirements for the area of specialization (how are the requirements different for this area of specialization compared to other areas of specialization or to the major without an area of specialization). (For new specialization only.)
12 credits required in the area of specialization
10.   Estimate the number of students who will graduate with this major and degree each year and the number who will graduate with this area of specialization. (For new specialization only.)
Unknown.
11   What resources (faculty, courses, research facilities, library facilities, etc) are available to support the area of specialization? (For new specialization only.)
S. Basu, T. Daniels, N. Gong, M. Govindarasu (group chair), Y. Guan, S. Kothari, R. Kumar, G. Luecke (Mathematics Dept.), D. Qiao, D. Rover, A. Stoytchev, S. Tirthapura
CprE 525, CprE 526, CprE 528, CprE 546, CprE 550, CprE 554, CprE 556, CprE 557, CprE 558, CprE 582, CprE 626
12.   What future financial support will be needed? (For new specialization only.)
As this specialization has existed informally, no new financial support is sought with this request