Engineering Faculty Council 2018-2019
College of Engineering
University of Iowa
Meeting #14
Tuesday Dec 18, 2018
11:00 AM – 12 noon, room
SC 4511

Upcoming meetings

Tues Jan 8, EFC will possibly meet

Meeting 14 agenda

1. Call to order
2. Approve minutes from EFC meeting #13
3. Discuss Provost Incentive Fund Proposals – Dean Scranton would like a yes / no decision whether EFC can support each, comments / pros-cons / implementation suggestions for each, and a signed faculty governance form for any supported proposal.
4. Review / discuss interim reports from committees
5. If time – review, discuss minutes and to-do tasks resulting from Dec 10 College Faculty Meeting
Engineering Faculty Council 2018—2019
Meeting #13 December 04 2018

DRAFT Minutes

Present (EFC): Profs. Rahman, Rahmatalla, Stanier, Wilder

Present (Dean’s office and/or other visitors): Profs. Grosland, ex-officio; Vigmostad

1. Professor Stanier called the meeting to order at 11:00 a.m.

2. The minutes from the November 27 EFC meeting #12 were approved.

3. Announcements:
   
   a. The EFC discussed the reminder to committee chairs’ to submit interim reports submission

4. The EFC discussed the Fall faculty meeting agenda.
   
   a. add to the agenda a request for Faculty Senate nominees from the CoE.

5. The EFC discussed the process of the first and the existence of a second application to the Provost Incentive Award.

6. Sarah Vigmostad discussed the UI Faculty Senate and its role. It became clear that the following would be good practice:
   
   a. Involve the CoE EFC or EAC in nominating individuals for Faculty Senate membership.
   b. Department faculty meetings would benefit from setting aside time to hear about faculty governance issues.

7. The meeting was adjourned at 11:43 am.
College: **Engineering**

Briefly describe the college’s process for disseminating the call for proposals and vetting of the proposal, including participation of collegiate shared governance.

1. The Provost Investment Fund Proposal Call was Announced to the Engineering Advisory Council (EAC) at their November 9, 2018 meeting. This proposal (Iowa Initiative for Artificial Intelligence) was already in draft form at that time. Feedback on the Iowa Initiative for Artificial Intelligence was requested, and competing proposals for Dean’s consideration were also requested.
2. The Provost Investment Fund Proposal Call was emailed to all DEOs in the College of Engineering on November 30, 2018, and again on December 12, 2018 – with a December 14 internal deadline.
3. Collegiate shared governance was exercised for this proposal (Iowa Initiative for Artificial Intelligence) in the following ways:
   a. This initiative was discussed and approved by DEO’s of each department during the Engineering Administrative Council meetings at two occasions – October and November 2018.
   b. The PI Milan Sonka presented the idea to the Engineering Faculty Council on November 13.
   c. This research initiative is complementary but independent from ongoing efforts within the CoE to bring AI and machine learning to the undergraduate curriculum.
   d. This initiative is supported by Engineering Computer Services (ECS) and its staff since ECS is expected to play an important service role facilitating implementation of IIAI research resources in close collaboration with ITS.
   e. Fill in final entry depending on outcome of 12/18/2018 EFC meeting.

This signature indicates approval of the proposed initiative.

_________________________  ____________________________
Collegiate Dean’s Signature     Date
College: Engineering

Briefly describe the college’s process for disseminating the call for proposals and vetting of the proposal, including participation of collegiate shared governance.

1. The Provost Investment Fund Proposal Call was Announced to the Engineering Advisory Council (EAC) at their November 9, 2018 meeting.
2. The Provost Investment Fund Proposal Call was emailed to all DEOs in the College of Engineering on November 30, 2018, and again on December 12, 2018 – with a December 14 internal deadline.
3. Collegiate shared governance was exercised for this proposal (Iowa Initiative for Artificial Intelligence) in the following ways:
   a. This initiative was presented to the Engineering Faculty Council on December 18, 2018.
   b. Fill in final entry depending on outcome of 12/18/2018 EFC meeting.

This signature indicates approval of the proposed initiative.

________________________________________  _________________________
Collegiate Dean’s Signature                 Date
**Initiative Title:** Big Ideas, Big Impact: Interdisciplinary General Education Courses at UI

**Primary Initiative Contact Name/Email:** Professor Cornelia Lang; cornelia-lang@uiowa.edu

**Initiative Collaborators Include:** CLAS, Tippie College of Business, Colleges of Engineering, Education and Law, Associate Provost for Undergrad. Education (University College, Director of Assessment, Academic Advising Center), OTLT (Center for Teaching), and Office of Admissions

**Brief Description (<150 words; including link to UI Strategic Plan and/or AAU metrics)**

“Big Ideas” interdisciplinary courses aim to enhance the success of undergraduates by focusing on timely and pressing topics that require insight from interdisciplinary faculty teams, rather than from within the confines of traditional single disciplines. Big Ideas courses are designed around inquiry-based learning styles, which require students to synthesize and apply information rather than listening and memorizing. Big Ideas courses must be approved for one of the UI general education requirements and should be taught by teams of 3 faculty members (from partnering UI Colleges, e.g., CLAS, TCOB, Engineering, Law and Education); Cross-Collegiate partnerships benefit both undergraduate students and faculty and encourage undergraduates to consider graduate and professional programs at UI. Currently, 7 Big Ideas courses have been designed and taught; we propose to expand to 13 courses, impacting 1000+ students annually. This proposed initiative ties in closely to the UI Strategic Plan (Student Success, Research/Discovery, Campus Climate): using high impact practices in the classroom, promoting undergraduate-to-graduate/professional programs, fostering curricular innovation around interdisciplinary research and collaboration and courses developed for the general education requirement in Diversity and Inclusion. Faculty shared governance groups support Big Ideas courses.

**What measurable benchmarks will be tracked to indicate progress and success each year? What are the targeted outcomes at the end of the funding period?**

The success of Big Ideas courses will be tracked each year by an assessment team using the following benchmarks: (1) the students’ ability to synthesize information from different disciplines to help them achieve the three main goals of the general education program (breadth of knowledge, learning how to learn and development of academic skills); (2) the factors associated with students’ decisions to pursue further coursework or to major in a discipline of a Big Ideas course; and (3) a longitudinal “Big Ideas Exit Survey” for students to report on the impact of these courses on their academic experience at UI when they graduate. Initial data from the Big Ideas Exit Survey show these courses have already had a very positive impact – students rate very highly (> 70% agree/strongly agree) the following aspects of their Big Ideas experience: “I became more excited about college-level learning”, “It was important to explore a Big Idea from multiple perspectives” and “I have more confidence connecting with faculty members.” The measurable targeted outcomes for the development of new “Big Ideas” courses will include: the number of students enrolled in all Big Ideas courses (goal > 1000/year) and high student academic success benchmarks, such as: “The format of this course helped me develop critical thinking and reasoning skills”, “The UI academic experience seemed more personal” and “This course helped me form and express my opinion in class and contribute to class discussions meaningfully” (also see above).
Total Funding Amount Requested: $216,000

Funding Period Requested: _____ 1 Year ________ 2 Years ________ X 3 Years

How will funds be budgeted/expended?

1. Faculty Compensation: (see below)
2. Staff Compensation: __________
3. Student Support: $24,000 for Graduate RA Assessment Fellow
4. Equipment: __________
5. General Expense: __________
6. Other: 6 x Big Ideas course development funds ($16,000) = $96,000 for faculty development time

Provide a budget justification for requested funds.
The support requested is for the development, coordination and assessment of six new Big Ideas courses (2 courses/year over 3 years). We request (1) faculty development funds (equivalent of one summer month of salary) that will be awarded to a faculty course director leading the development effort of each course; (2) funding to support a Big Ideas faculty program director who will coordinate the staffing and scheduling of Big Ideas courses (faculty teams, TA appointments), communicate with Collegiate Deans, advising staff, and the registrar, collaborate with the Center for Teaching to develop a curricular template to be used by Big Ideas faculty teams, and publicize the Big Ideas courses to a variety of audiences. The faculty director will also establish a Big Ideas advisory board (consisting of faculty, associate deans, and advising staff) who will review new course proposals and assessment data from existing courses, and evaluate applications for TAs; (3) funding for a senior graduate student (in the Center for Teaching) to be a Big Ideas Assessment Fellow. This graduate research fellow will work with Big Ideas faculty teams to implement assessment strategies, analyze assessment data and and collaborate on publications related to the assessment outcomes. After the three year funding period, new Big Ideas courses may be developed and rotate into the series; the PI and collaborators plan to submit proposals to NSF-IUSE (education initiatives) and the Carver Trust for additional funding.

Provide a description of resources that collaborators will be contributing (e.g., faculty and staff time, equipment, supply expenses, etc.).
CLAS Departments & Programs, Tippie College of Business, Colleges of Engineering, Education and Law: faculty from different disciplines will form teams to develop and teach Big Ideas courses.

OTLT Center for Teaching: Director Jean Florman and staff will work with faculty director to support Big Ideas teams curricular design and assessment and support the Faculty Learning Community on Big Ideas (for discussion of best practices for Big Ideas courses since 2015).

Office of the Associate Provost for Undergraduate Education Partners: (1) Director of Assessment (Wayne Jacobson) will work with faculty director and assessment fellow to assess student learning in Big Ideas courses and develop appropriate benchmarks and outcomes for the program, (2) University College staff will encourage students to participate in these high-impact courses and (3) Academic Advising Center staff will encourage students to fulfill at least one of their general education requirements through taking a Big Ideas course, thereby exploring more disciplines.

Office of Admissions staff will help promote Big Ideas courses as part of the “destination university” marketing; no other regional peer institution offers undergraduate general education Big Ideas courses.
Working Title: Societal Impacts of Artificial Intelligence

Synopsis: This course will investigate the profound ways in which the rapid advancement of machine intelligence will continue to transform our culture and society. We will examine both the potential societal benefits of AI, such as personalized healthcare and self-driving vehicles, as well as the potential negative impacts, such as loss of jobs and erosion of personal privacy. We will also consider ethical and legal challenges posed by the widespread deployment of artificially-intelligent systems. In-class discussions will focus on provocative topics such as:

- What is the difference between human intelligence and machine intelligence?
- Does the continuing advancement of artificial intelligence pose a threat to society?
- Will humans become obsolete?
- How can intelligent systems enhance human welfare?

The course will be collaboratively taught. We will solicit involvement from faculty in Anthropology, Computer Science, Law, Philosophy, Sociology, and other academic departments from throughout the university. We will also bring in outside experts to lead class discussions. Ideally, the course will be taught in a TILE or similarly equipped classroom.
Iowa Initiative for Artificial Intelligence – Brief Overview
(Alec Scranton, 9/14/18)

The incipient Initiative for Artificial Intelligence at the University of Iowa is motivated by the fact that Artificial Intelligence (AI), including machine learning, synthetic vision, decision making, smart systems, etc., is reshaping every aspect of society and industry. Progress in the science and technologies associated with big data, computational power, sensors, and interconnectivity have enabled unprecedented advances which will influence all aspects of our research and educational endeavors. It is critical for the colleges, in close collaboration with ITS, to build and foster the AI capabilities for the University of Iowa campus.

The proposed Iowa Initiative for Artificial Intelligence (IIAI) will focus on (goals, problems, and benefits to the UI):

1) Increasing availability of campus-wide AI-specific computational environment with effective administrative structure – building on the successful model of High Performance Computing on campus and leveraging existing funding.
   a. Current AI/GPU/machine learning computational resources require continuous growth and efficient management, UI is falling behind on their availability for supporting our research and educational missions.
      Resulting from the IIAI initiative, centralized AI-enabled computer cluster capacity will be continuously enhanced and maintained to serve research needs on campus, benefitting Colleges, Centers, and interdisciplinary researchers.
   b. Development of AI/GPU methods for the computer cluster requires availability of a smaller-scale interdisciplinary development lab(s) to design, debug, and test applications efficiently. Such an environment does not currently exist.
      Decentralized AI-development labs will be established. First two will be built in FY19 (Seamans Center, Pappajohn Biomedical Discovery Building), with more to be built as needed to support growth of the community.

2) Building AI-enabling project-related expertise brings together an interdisciplinary community of experts, educators, students, and research users.
   AI and deep learning (DL) will augment and perhaps partially and gradually replace conventional analysis approaches. To stay competitive, interdisciplinary collaborative access to AI/DL know-how is critical.
   IIAI will provide access to AI/DL interdisciplinary knowledge via hiring and properly training interdisciplinary AI/DL researchers (PhD level) who will act as knowledge consultants available to these research groups, who will contribute to and take part in new research grant proposals thus increasing grant submission success rates.
   Development labs will naturally contribute to cross-pollination of AI/DL knowledge as they bring expert and novice users together in a collaborative environment.
   IIAI will raise the overall level of AI expertise on campus and increase the number of competitive AI-related research proposals.
   a. AI/DL training and education of (potential) users at UI is currently not sufficient/efficient and needs to be flexible to quickly respond to the changing landscape of AI/DL.
      IIAI will join forces with UI3 to jointly offer relevant and accessible AI/DL education and training at all levels of expertise to maximize the impact on the UI research community.

3) Advocating for research access to relevant data necessary for extramurally funded AI-research projects.
   a. AI/DL projects depend to a large extent on availability of training data. Many barriers exist to providing access to large volumes of UI-based data across disciplines, thus making rapid research progress difficult at UI.
      IIAI will work closely with ICTS, CPH, UI3, TSB, as well as other UI and non-UI entities to develop policies and agreements to facilitate data access. These policies will help resolve data ownership issues as they emerge.
      IIAI will maintain repositories of commonly used relevant research datasets that are too large for single labs to maintain, but can be shared across many labs on campus. IIAI will collaborate with the campus HPC community and with UI3 to provide data transfer mechanisms both within the university and with external collaborators.
      IIAI will provide access to datasets that would not otherwise be easily available.
Office of the Provost
Provost Investment Fund
Call for Proposals – FY2019

Initiative Title: Iowa Initiative for Artificial Intelligence

Primary Initiative Contact Name/Email: Alec Scranton, alec-scranton@uiowa.edu

Initiative Collaborators Include: College of Engineering, Information Technology Services, DVPR, Tippie College of Business, CCoM, Dentistry, CLAS, Public Health, Education, Pharmacy, Dentistry, Law, Nursing, Grad College

Brief Description (<150 words; including link to UI Strategic Plan and/or AAU metrics)

Artificial Intelligence (AI), combined with deep learning and smart systems, promises unprecedented societal and industrial impact. AI will reshape all aspects of our research endeavor. It is critical that UI position itself as a leading institution in this area.

The proposed Iowa Initiative for Artificial Intelligence will focus on:

1) Increasing availability of campus-wide AI-specific computational environment with effective administrative structure – building on the successful model of High Performance Computing on campus and leveraging existing funding;

2) Building AI-enabling project-related expertise bringing together an interdisciplinary community of experts, educators, students, and research users; and

3) Advocating needs for access to relevant AI-research data necessary for extramurally funded projects.

This initiative will improve AAU metrics by enhancing federal/industrial funding, publications, citations, and relevance of student education. It aligns with UI Strategic Plan: creating critical infrastructure, maximizing research productivity, strengthening economic development, generating intellectual property, and producing graduates in extremely-high demand.

1
What measurable benchmarks will be tracked to indicate progress and success each year? What are the targeted outcomes at the end of the funding period?

We will concentrate on annual assessment of metrics related to each of the stated goals:

A) AI-enabling infrastructure development and administration
   a. Number of AI/GPU enabled computer cluster nodes available to UI researchers in HPC and development computers in decentralized labs
   b. Percent utilization of available resources
   c. Ability to satisfy newly-identified infrastructural needs of the UI community in AI research

B) Building interdisciplinary community at the UI
   a. Impact on research grants submitted, funded; research results disseminated in publications and subsequently cited
   b. Number of UI researchers actively participating in this initiative
   c. Diversity of units, departments, laboratories, programs utilizing the Initiative's resources

C) Data access and establishment of outside ties (beginning year 2)
   a. Number of investigators gaining access to UI data resources, including healthcare and population data, with a simplified technological and regulatory threshold of gaining such data access
   b. Number of UI centers and institutes collaborating on providing research data access to support AI research on campus
   c. Number of association agreements with Iowa and other industrial partners
   d. Support from outside partners for the Initiative and its continuation

At the end of the 3-year funding period, in addition to demonstrating progress using the above yearly-assessed metrics, we expect that the initiative will become sustainable by securing support from federal and industrial sources as well as by commitments from CoE, ITS, TCB, other colleges. The demonstrated long-term sustainability will be the main quantitative index measuring the outcome success of this initiative.
Total Funding Amount Requested: $ 300,000

Funding Period Requested: ____ 1 Year ______ 2 Years    X 3 Years

How will funds be budgeted/expended?

1. Faculty Compensation: ___ $0________
2. Staff Compensation: ___ $210,000________
3. Student Support: ______ $0________
4. Equipment: __________ $90,000________
5. General Expense: ______ $0________
6. Other: __________________ $0______________________________________________________

Provide a budget justification for requested funds.

To accomplish the main goals of the initiative, the requested funds will be used for development of the computational AI environment and for user support:

Computational environment:

- Part of the requested funds will be used for building the computation environment that will support AI research computing on campus. We envision that the following main areas will be supported:
  - Centralized AI-enabled computer cluster
  - Two (2) decentralized AI-development labs (one in Seamans Center, one on the west campus, possibly in the Pappajohn Biomedical Discovery Building)
  - Special AI-enabling file server and associated data storage to facilitate high-speed data stream to the GPU-intensive (graphical processing unit) AI computational environment
- $90,000 is requested over three years to support this aspect of the initiative ($30,000/year)

User support:

- There are at least three groups of research users on campus
  1) AI developers and experts;
  2) Researchers who wish to use AI in their research not having skills to utilize AI approaches directly; and
  3) Researchers not-yet aware of the potential progress achievable by incorporating AI in their research.
- This initiative will bring together all these three groups by providing several levels of user support.
- This support will be facilitated by funding a Research Engineer (at 50-100% effort) and/or an existing postdoctoral associate (at 50-100% effort) to serve as the project-enabling consultant participating in project design, application development, and research grant writing collaborations.
- $210,000 is requested over three years to support this aspect of the initiative ($70,000/year)

Provide a description of resources that collaborators will be contributing (e.g., faculty and staff time, equipment, supply expenses, etc.).

The initiative will be simultaneously supported by the following commitments demonstrating the broad collegiate/ITS support and contributing to its success:

**Contributions from individual colleges to be determined.**
College: Engineering

Briefly describe the college's process for disseminating the call for proposals and vetting of the proposal, including participation of collegiate shared governance.

1) Proposing this initiative is supported by the Engineering Faculty Council that engaged faculty in discussing of and assigning a high priority level to this initiative.
2) This initiative was discussed and approved by DEO's of each department during the Engineering Administrative Council meetings at two occasions – October and November 2018.
3) This research initiative is independently associated with an educational initiative at Engineering of bringing AI and machine learning to the undergraduate curriculum for all CoE students.
4) This initiative is supported by Engineering Computer Services (ECS) and its staff since ECS is expected to play an important service role facilitating implementation of IIAI research resources in close collaboration with ITS.

This signature indicates approval of the proposed initiative.

__________________________  ____________________________
Collegiate Dean’s Signature   Date
TO BE COMPLETED BY DEAN OF EACH COLLABORATING COLLEGE

College: ____________________________________________________________

Business
CLAS
CCoM
Public Health
Education
Pharmacy
Dentistry
Law
Nursing
Grad College

Briefly describe the college's process for disseminating the call for proposals and vetting of the proposal, including participation of collegiate shared governance.

This signature indicates approval of the proposed initiative.

__________________________________  ____________________________
Collegiate Dean’s Signature         Date
TO BE COMPLETED BY DIRECTOR OF EACH COLLABORATING CENTRAL UNIT

(if applicable)

Central Unit: Information Technology Services

Signature of central unit director collaborating on the proposal. This signature indicates approval of the proposed initiative.

__________________________________  ____________________
Signature  Date
TO BE COMPLETED BY DIRECTOR OF EACH COLLABORATING CENTRAL UNIT
(if applicable)

Central Unit: Office of Vice-President for Research

Signature of central unit director collaborating on the proposal. This signature indicates approval of the proposed initiative.

________________________________________  ________________
Signature                                      Date
What will colleges get from IIAI if financially contributing?

1) AI/Machine Learning environment
   a. Access to a well-designed and well-maintained deep learning/GPU/Al environment
      i. Engineering Computing Services will fulfill this role for the participating colleges
      ii. Environment will
          1. include well-tested instructions for users
          2. only allow access to users who passed entry-level user tests
          3. operate based on a well-developed use policy
      iii. Environment will allow
          1. Development of applications and initial testing in IIAI development labs
          2. Access to staging storage space for AI development, well organized with
             group access for research teams
          3. Seamless transition to run production-level jobs on Argon HPC cluster
   b. Access to state-of-the-art, cutting-edge environment
      i. Environment will be kept at the forefront of technology
      ii. Computational upgrades will be financed from IIAI resources
   c. Scalable environment of sufficient capacity
      i. As the use needs grow, IIAI will respond quickly and operatively
   d. AI/GPU-enabled Argon HPC environment will be kept at sufficient capacity and
      performance level
      i. achieved by collaboration with ITS
      ii. partly funded by ITS directly, partly from IIAI resources

2) Access to problem-solving expertise
   a. Space in CoE will be available to hold research-problem specific consultations
   b. Experienced researchers (staff, faculty, postdocs) will be available as “consultants” to
      i. discuss the problem
      ii. state the problem in well-defined terms suitable for applying AI approaches
      iii. discuss needs for training/evaluation/testing data
      iv. propose a solution strategy
      v. help with obtaining pilot results
      vi. help with writing a research proposal = writing the AI piece of a proposal
          (assumes that the staff member will become part of the proposal team with
          identified relevant % effort)
   c. Consultants will be paid for their services using IIAI resources.

3) Education for users
   a. Short courses will be developed and offered in collaboration with UI3.
      i. Courses will be topic/environment-specific as well as general.
   b. Courses need to be developed – developers will be paid from the IIBI resources.
   c. CoE GPU-enabled classroom will be available for user education activities when not used
      for CoE courses.
Engineering Technology Committee Interim Report

December 15, 2018

Members

Prof. Michael Schnieders (BME), Chair
Prof. Stephen Back (ISE)
Prof. Reinhard R. Beichel (ECE)
Prof. Ibrahim Demir (CEE)
Prof. Chris Coretsopoulos (CBE)
Mr. Danny Tang (ETC), ex Officio non-voting

Term Expiring
May 2019
May 2021
May 2021
May 2021
May 2020

EFC Liaison Member

Prof. Sharif Rahman (ME)

General Charge

The Engineering Technology Committee shall be responsible for prioritizing information technology needs for the college related to education and teaching, reviewing and evaluating policies governing hardware, software, shops and computing services within the college, evaluating the effectiveness of the Engineering Technology Center and technology infrastructure used by the college, and advocating for information technology needs to the university.

Introduction to the Interim Report

On October 23rd, 2018, Schnieders met with the Engineering Faculty Council to discuss the ETC charges for the ‘18-'19 academic year. Points of emphasis included the importance of meeting with the DEO of each Department to access emerging IT needs, continued monitoring of the OneIT process to ensure College IT needs are met, continued monitoring of the new annex teaching spaces and maker space, and finally assessment of the policy governing acceptable student behavior in Engineering Computer Laboratories. These points of emphasis were discussed among members of the ETC and with each DEO. Progress towards addressing the charges is elaborated on below, beginning with specific feedback from each Department and DEO. Finally, a few overall conclusions are offered based major themes that arose repeatedly in the discussions.

Specific Charges

1. Meet with the DEO of each Department to review current technology, services and infrastructure and review the College and Departmental lists of priorities. This will ensure that the needs of the departments are specifically recognized in the committee’s planning and advocacy.

Biomedical Engineering

Tang and Schnieders met with DEO Joe Reinhardt on Nov. 30th

• Software licenses were discussed:
  o The recent change in terms for the Adobe suite was considered, and the possibility of the College of Engineering or ETS subsidizing Adobe licenses for interested faculty was brought up.
The issue of software that has variable license terms for teaching (freely allowed) vs research (for a fee) was discussed (e.g. the Prism software).

- The need for documentation within conference rooms of who to call for support was mentioned (e.g. using placards).
- Although the use of laptops within the 90/120 seat general assignment classrooms for Creo has in general been a success, there may remain limitations for large part assemblies (e.g. assemblies that become more common in Creo courses toward the end of the semester).
- DEO Reinhardt was appreciative of the dedication from ETC staff as the classrooms in the new Annex became operational (e.g. Matt McLaughlin was stationed in the room as teaching began to help with issues as they arose). He also expressed thanks to ETC for supplying instructional faculty with laptop and iPad devices for use in their teaching.
- Synergy with the ECE classrooms was discussed (e.g. BME Systems, Instrumentation and Data Acquisition room 1440 SC with ECE 2325 SC). Enthusiasm for using identical equipment between rooms was expressed. In the future, course scheduling flexibility may become a possibility.
- Synergy with CBE the area of Biomolecular Engineering was considered, including lab / classroom management by Sathivel Chinnathambi.
- Future Charges could include
  - Review of lab management services and recommendations for future refinements.
  - Review of research computing services and costs (e.g. consistent costs across research centers and investigators)

**Chemical and Biochemical Engineering**

Coretsopolous, Tang and Schnieders met with DEO Alan Guymon on Nov. 27th.

- Further improvements to the College of Engineering website is a priority and is being facilitated by a CBE committee of students.
- Difficulties with lecture capture in SC 2229 were noted during the Fall ‘19 semester.
- Continued licensing of LabView and Aspen is needed.
- Poster printing via ETS is a success story in terms of both cost and convenience.
- The need for updated computers in conference rooms was noted. Coordinating with updates to faculty and staff computers is a possibility (e.g. waterfall older faculty / staff computers to conference rooms).
- A preferred vendor list would be useful for services not provided by the Engineering Machine Shop.
- Need for welding and machine shop instruction for students in courses and clubs.

**Civil and Environmental Engineering**

Demir, Tang, and Schnieders met with DEO Allen Bradley on Nov. 27th.

- CEE teaching is successfully leveraging computer enabled classrooms (i.e. 1245 SC):
  - CEE:2015 Civil Engineering Tools (William Eichinger)
  - CEE:3136 Design of Concrete Structures (Asghar Bhatti)
• CEE:4762 Design of Transportation Systems (Paul Hanley)
• CEE:5310 Informatics for Sustainable Systems (Ibrahim Demir)

• CEE has emerging needs for space to support strategic research and teaching directions
  o Lab space for establishing a Visualization Center for Hydroinformatics. Lab will
    focus on scientific visualization and communication using artificial intelligence,
    visual data analytics, augmented and virtual reality applications, serious gaming.
    The lab needs open space for AR/VR applications, motion simulators, and
    interactive and touch enable displays and projectors.

  **Electrical and Computer Engineering**

  Beichel, Tang and Schnieders met with DEO Er-wei Bai on Nov. 26th.

• As enrollment in ECE has increased (~550 undergraduates expected next year),
  scheduling of ECE laboratory centric courses is becoming a challenge. These courses
  include
    o ECE:2410 Principles of Electronic Instrumentation (~100 current enrollment,
      instructor: Anton Kruger); five 2-hour lab sections in 2325 SC (max. 30 students)
      on Tuesdays from 8:30am until 7:50pm (note: constraints due to scheduling
      conflicts with other courses).
    o ECE:3320 Introduction to Digital Design (~104 current enrollment, instructor:
      James Maxted) in 2244 SC (fall semester, 20 workstations in lab).
    o ECE:3360 Embedded Systems (~90 current enrollment, instructor: Reinhard
      Beichel) in 2244 SC (spring semester, 20 workstations in lab).
    o ECE:4890 Sr Elec and Computer Engineering Design (instructors: Raghuraman
      Mudumbai and Jon Kuhl) in 2253 SC (required for everyone; times arranged to
      accommodate students).

• One potential solution could be to share lab space with other departments to address
  bottlenecks.

• Further improvements to the College of Engineering ECE website is a priority.

• Noted that the Student Design Room SC 2040 needs an improved display.

  **Industrial and Systems Engineering**

  Baek, Tang and Schnieders met with DEO Geb Thomas on Nov. 30th.

• In addition to the Creo software used by multiple Departments, the Arena software is
  important for the ISE Digital Systems Simulation course.

• The issue of supporting remote PhD students using Zoom was discussed in the context of
  cost / benefit trade-offs (e.g. accommodating a single student is not cost effective and
  should not be an expectation in the College).

• The Annex 4th floor conference room window shades have shown glitches; this reiterates
  the need for conference room placards to inform users who to contact for support.

• In general, the software load on conference room computers was discussed. CTO Tang
  indicated conference room computers have a “lighter” software load, in part due to these
  computers often being lower spec than Faculty/Staff computers (i.e. there is no budget
  line currently to replace or upgrade conference room computers).
• The trade-offs of having students use computer labs compared to “buying their own device” (BTOD) was discussed, especially in the context of software licenses. It is important to note that maintaining and negotiating software licenses is time-consuming and costly for the CTO / ETC. Going forward, a systematic way to quantify the cost / benefit ratio of software purchases is warranted to add transparency to purchasing decisions.

• The observation of some overlap in resources for the DFM lab, ETC machine shop and BME machining labs was noted. This could be leveraged by purchasing the same (or similar) equipment when possible to facilitate maintenance issues.

• The issue of ETC staff size was raised in the context of supporting the ML/AI initiative. Further consideration in the context of overall College of Engineering budget constraints may be warranted.

Mechanical Engineering

Rahman, Tang and Schnieders met with DEO Ching-long Lin on Nov. 26th.

• Several ME courses depend on using computer enabled classrooms including
  o ME:2200 Introduction to ME Design (Michael Augspurger)
  o ME:4024 Product Design and Realization (Phillip Deierling)
  o ME:4111 Scientific Computing & Machine Learning (Shaoping Xiao)
  o ME:4116 Manufacturing Processes Simulations and Automation (Hongtao Ding)
  o ME:4117 Finite Element Analysis (Jia Lu)

• Feedback was positive that use of the GPU enabled desktop computers in 1245 SC as well as the larger Annex classrooms (via laptops with Virtual Desktop software backed by GPU-enabled servers) are currently meetings these teaching needs. For the first time in the Fall of ’19, the Creo software could load and perform efficiently on laptops via Virtual Desktop. These classrooms solutions are a success story for meeting the increasing need for compute intensive courses. Emerging teaching needs due to increased use of ML / AI in existing and new courses may also be met in this way.

• The importance of supporting the Design for Manufacturing (DFM) Lab was emphasized, including continued emphasis on TA / student safety.
  o The DFM lab is utilized by ME:2300 Manufacturing Processes (Hongtao Ding)

• Emerging strategic directions for ME include the “Industrial Internet of Things” (IIoT) and Advanced Manufacturing (i.e. “Robotic Automation of Manufacturing”), which open the door to new research and educational opportunities but could also create new space needs.

2. Continue to monitor the University of Iowa’s OneIT process to ensure that IT services are consistent with the College expectations.

As of April 1st, 2018, when the ‘17-’18 final ETC report was completed, it was “difficult to assess significant time or other resource savings from OneIT projects” as “many of the projects relevant to Engineering remain in progress with a June 2018 deadline.” It was noted that as these projects were on-going, they were a resource drain rather than a savings. Furthermore, even after the June 2018 deadline, the CTO expected a period of transition
before a "steady state" emerged (i.e. possibly up to a whole academic year). It was noted that a OneIT project that may potentially result in freeing up resources was the OneIT network project (i.e. if the College of Engineering's network is successfully migrated to a similarly capable service provided by ITS, then significant staff time and funding can be reallocated).

These expectations have largely born true. Network services has transitioned to ITS as the primary service provider. Although significant coordination still takes places between ECS and ITS to ensure network services meet the needs of Engineering. Service levels have not degraded, although limited savings in staff time has occurred. Primary benefits from this service transition is greater redundancy due to more staff involved with supporting this service. Possible monetary savings to the college are possible once network equipment refresh occurs in a few years.

End User Support services have also transferred to ITS, which includes the transfer of one FTE from ECS to ITS, in the form of Sarah Williams. Although this didn’t take place until the summer of 2018, significant impacts due to this change has not yet been observed.

In terms of ensuring Engineering has significant influence within OneIT, there has been significant success. The CTO sits on both the OneIT Operations Team and the OneIT strategy team. He also is one of the few collegiate IT directors to have a regular meeting with the University CIO. Various other members of ECS also have seats at various other OneIT committees.

Coordination of OneIT and ETC staffing and services for further opportunities to better support the Research mission.

The CTO continues to make a proactive effort to engage research centers to gain a better understanding of their environments and discover areas of need or opportunity in supporting research. Several departments have indicated that a uniform strategy for data storage and collaborative file sharing is needed. There is an item in the OneIT road map to reevaluate cloud storage strategies which may yield an alternative to OneDrive.

3. Continue to monitor the new annex teaching spaces, and the maker space for utilization and improvements that are needed in both technology and policy. Recommend improvements that will enable the new digitally-enabled collaborative learning space for team-based education.

The new annex space was not yet fully operational during the ‘17-'18 academic year, and “minimal evaluation of the utilization was performed.” A listing of the technological capabilities of the annex space was generated (see listing at end of this report). Based on ETC discussions with DEOs during the Fall ‘18 semester, it became clear that the Annex teaching spaces (i.e. both the 90 and 120-person classrooms) were a success. Especially noteworthy is the ability to run graphics intensive software (e.g. Creo) on the classroom laptops over Virtual Desktop thanks to ETC servers equipped with powerful nVidia GPUs. This solution from the CTO has been hugely successful, with perhaps the only imperfection
remaining is that loading some of the more sophisticated Creo models can lack the performance of a GPU-equipped desktop.

The maker space room was noted to need additional monitoring during the ‘18-’19 academic year as it becomes fully operational. During the previous year, it was identified that TV screens in student design studio were too small, and this issue was raised with the ETC staff. This issue was again raised during the Fall ‘18 meetings with DEOs to the CTO, and solutions are in progress (i.e. the CTO already has in hand more TV screens for installation soon). It should be noted that as the CTO and ETC staff continue to provide support for the new annex spaces, they face some constraints due to terms of the construction contract.

4. Monitor the implementation of the policy governing acceptable student behavior in the Engineering Computer Laboratories, and report on its effectiveness.

During the ‘17-’18 academic year, universal support from the DEO’s, ETC committee, and CTO was voiced for a policy governing acceptable student behavior in the Engineering Computer Laboratories. Based on this input, the CTO developed a policy that is a superset of the university technology policy, which is posted online:

https://etc.engineering.uiowa.edu/tools-and-resources/it-policies#IT-Usage-Guidelines-and-Good-Practices

Although there is agreement that the policy needs to have well-defined penalties for misuse, common sense enforcement approaches were yet to be established as of the Fall ‘18 semester. For example, hiring student lab monitors and/or contracting with the University of Iowa Department of Public Safety to install cameras are both seen as prohibitively expensive and unnecessary. Alternatively, the ETC and CTO prefer clearly posting placards in the computer labs to indicate where the ETC Usage Guidelines can be found online, and to encourage students to report violations if their work is disrupted.

5. Recommend specific charges for the 2019-2020 Engineering Technology Committee.

- Monitor and support incorporation of artificial intelligence and machine learning into the College of Engineering research and teaching missions.
- Review of ETC lab management services and recommend future refinements.
- Review of ETC research computing services and costs (e.g. consistent costs across research centers and investigators)


ETC Interim Report Conclusions

Following the DEO meetings, ETC members Baek, Beichel, Demir, Schnieders and Tang met on December 5th to synthesize feedback, finalize this interim report, and formulate the conclusions listed below.

Software: Management of software is expensive both in terms of licensing costs and time. For example, the CTO / ETC must systematically prioritize software acquisition (i.e. via cost/benefit
analyses), manage purchasing agreements, and manage installations. Further consideration of how to support the CTO / ETC in minimizing license costs and acquisition / maintenance time, while improving transparency in the decision making, is recommended.

**Teaching Mission**: For each Department, there tend to be a few classes that need special resources (e.g. electrical or mechanical lab courses, courses that need GPU computing resources, etc.) that can become a scheduling bottleneck (especially as enrollment has increased). For lab courses, coordinating equipment purchases (to the extent possible) between Departments can help to provide increased flexibility (e.g. in the future, ECE and BME could coordinate in purchasing the same oscilloscopes, signal generators, etc.). For computing courses, using “simple” laptops to access advanced compute capabilities (e.g. Creo via Virtual Desktop backed by GPU servers) is a clear success story.

**Research Mission**: Each Department articulated exciting research visions in emerging areas such as machine learning, artificial intelligence, internet of things, robotics and automation, virtual reality, synthetic biology, etc. In a number of cases, a limiting factor is simply the availability of appropriate research spaces. As space is clearly a limited resource, one recommendation is to consider consolidation of redundant teaching spaces.
Interim Report
2018-2019 Teaching Committee
College of Engineering
December 15, 2018

Members
Prof. Hiroyuki Sugiyama (ME) May 2019
Prof. Mark Andersland (ECE) May 2020
Prof. Michael Mackey (BME, chair) May 2020

EFC Liaison Member
Prof. Charles Stanier (CBE)

General Charge
The Teaching Committee shall be responsible for all matters relating to evaluation and improvement of the quality of instruction in the college, and for making appropriate recommendations to the dean and the faculty.

Specific Charges for the 2018-2019 Academic Year

1. Oversee the College Teaching Award nomination and selection process and revise as needed.

2. Continue to collect data regarding TA appointments for all ENGR. Using this data set and any other information you find useful, explore the impact of increased College enrollment on TA sustainability and the undergraduate and graduate educational experiences.


The College of Engineering Teaching Committee met on October 24, 2018 and had a series of email communications before and after the meeting. At this time, much of the committee work is in progress and will require passage into the next semester to be completed. At the October 24 meeting, the workload was divided amongst committee members. Prof. Sugiyama will work on the TA appointment analysis when college-wide data becomes available in the Spring. Prof. Andersland will continue serving as liaison to ICON committee. In the Spring, the committee will determine if its informal relationship interface to the ICON community should be recommended in the future, as this activity was not one of our charges. Prof. Mackey will obtain and distribute the Teaching Award application materials and facilitate the committee’s choice for the Award. He will also be responsible for preparing and submitting all written reports.
Prof. Andersland reports on his activities as liaison to ICON’s Steering Committee: So far the committee has met three times and participated in one conference (ICON NEXT, held in mid-October). The meetings have focused on increasing faculty participation in the university’s current affordable textbook initiatives: ICON Direct, Open Educational Resources (OTR), Textbook Affordability Pilot, and Hawk Shop book rentals, and on brainstorming more effective ways of teaching busy faculty what CANVAS can potentially do for them. Also of note: In January, examination services will be rolling out a new online exam scoring platform for those who give scantron exams. Once exams have been scanned the new platform will allow instructors to regrade the scans against other keys, award points for multiple answers, and do more sophisticated analysis of the scan results. A complete account of the ICON Steering Committee’s activities over the year will be included in the Final Report at the end of the year.

Once the TA appointment data is analyzed by Prof. Sugiyama in the Spring, the committee will review and craft recommendations for the Final Report.

A Final Report will be submitted to the EFC by the end of Spring Semester.

Respectfully Submitted,

Michael A. Mackey, PhD
Associate Professor
Roy J. Carver Department of Biomedical Engineering