The Engineering Technology Committee prepared this report for prioritizing information technology needs for the college related to education and teaching. During the AY17-18 the committee met several times to review and evaluate 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.

Meet with the DEO of each Department to review current technology, services, and infrastructure and review the five-year plan and list of priorities for the next year. Meeting with each departments representative will ensure that the needs of the departments are recognized explicitly in the committee’s planning and advocacy.

Overall, DEO’s and faculty indicated that in general the services provided by ECS are satisfactory. It is clear from conversations with faculty and DEO’s, that many departments recognized improvements regarding their web presence and the overall responsiveness of ETC's web services. Special mention was made regarding ETS’s ability to rapidly support some of new course requirements dynamically during the semester. The ability to address these requirements quickly has great benefit to our students and enhances our teaching capabilities. The new departmental websites have overall improved regarding aesthetics. However, content and usability remain somewhat lacking. Among the DEO’s there is a recognition that communication/marketing support for the college is severely lacking. There is a common theme that ETC is trying to do their best to address the vacuum of communications/marketing services, which is not part of their mandate or resources.

Several departments voiced concerns over the need for advanced instrumentation maintenance for teaching labs. DEO’s stated that defining when replacement of expensive equipment would be needed (or where funds would come from at that time) is challenging or impossible to foresee. The planned obsolescence of compute clusters approximately every 5 years is not analogous to the lifespan of equipment in the Carver Medical Device lab, or other departmental labs.

Investigate ETC staffing and services for further opportunities to better support the Teaching mission.

Further exploration of support services to reduce the burden of using technology for teaching purposes was evaluated. There needs to be an establishment of set technology training classes in preliminary shop skills/machine shop skills as well as specialized machine work, and welding practice should be set up as a formal offering at set predetermined times throughout the semester, this information could be included in a syllabus of a class so students could plan for this training.

ETC has recently hired two new engineers to provide lab management services for the Design for Manufacturing, Fluids and Experimental Engineering instructional facilities. The intent is to provide faculty and TAs teaching in these spaces with additional technical support. These positions will be providing equipment maintenance, support, training TAs and developing documentation for the long-term sustainability of these facilities. While the scope of these current positions is limited in just these three facilities, if they are deemed successful, it is possible that additional positions may be hired to support other similar facilities in the College. The DEO’s are monitoring the implementation of the current positions to determine if expansion of this mechanism for other labs is justified.
A critical bottleneck has been identified within the Engineering Machine Shop. During peak periods, the backlog of jobs can be over a month. Much of this can be attributed to walk-in consultations, which conflicts with staff time necessary for actual fabrication. The CTO has been in discussions with Machine Shops to implement an office hours / consultation-by-appointment-system to free up staff time for fabrication. This new system must be balanced with maintaining availability for consultation. Furthermore, for several years, the shops across the College seem to have been slipping into the model of getting away from hiring trained machinists and replacing them with students and others who lack specific professional knowledge and skills.

There is a recognized need for training of students to analyze big data via machine learning (ML) across many departments. ML often require specialized technologically advanced GPU computing environments that are not currently available in the computing labs. Only very limited hardware support is available on the college or campus-wide basis currently. Solutions could be a classroom with external GPUs (eGPUs) or use of Cloud Compute Services. Several meetings were held during the 2018 spring semester to discuss campus strategies and college of engineering strategies for supplying the hardware and training resources needed to meet student needs.

**Monitor the University of Iowa’s OneIT process to ensure that IT services are consistent with the College expectations.**

Currently, it is difficult to assess significant time or other resource savings from OneIT projects. Many of the projects relevant to Engineering remain in progress with a June 2018 deadline. As these projects are on-going, they currently are a resource drain rather than saving. However, even after the June 2018, the CTO expects a period of transition before a "steady state" emerges, possibly up to a whole academic year, whereby evaluation of time and resource savings can be made. One project which may potentially result in freeing up resources is the OneIT network project. If the College of Engineering's network can successfully be migrated to a similarly capable service provided by ITS, then significant staff time and funding can be reallocated for other more strategic work.

**Investigate ETC staffing and services for further opportunities to better support the Research mission.**

Due to the diverse and distributed nature of research at Iowa, it is currently difficult to comprehensively assess areas of need for all research. The CTO made a proactive effort to engage the research centers to gain a better understanding of their environments and discover areas of need or opportunity in supporting research. Several departments indicated that uniform strategy for data storage and collaborative file sharing was needed to meet the growing needs of both the research and teaching missions. The storage and sharing issue that continues to be investigated by ECS. There has been limited progress to bring an additional cloud storage service to campus. While there is recognition within the OneIT operations team that OneDrive has limited capabilities for meeting the storage and sharing needs of research, there is not yet a OneIT commitment to roll out an alternative service. The CTO will continue efforts to influence this as a campus priority. However, it must be recognized that there is limited capacity within ITS until OneIT projects are due to be complete in June 2018.

**Assess the need for policy governing acceptable student behavior in the Engineering Computer Laboratories. Also, propose policy languages as appropriate.**

Universal support from the DEO’s, ETC committee, and CTO for a policy governing acceptable student behavior in the Engineering Computer Laboratories. Draft language was discussed, and the CTO was developing a draft policy. The policy needs to be a superset of the university technology policy. There was agreement that the policy needs to have well-defined penalties for misuse.
**Study adequacy and effectiveness of electronic tools and facilities available for offering online courses. In addition, make recommendations to improve the experience of faculty who teaches online courses.**

The adequacy and effectiveness of electronic tools and facilities available for offering online courses was investigated. A list of existing tools and resources was compiled and sent to the Teaching Committee in October 2017. The Teaching committee then created a questionnaire to poll faculty of their experiences. The primary technology concerns were related to communication with students in 3 aspects: 1) Improved remote electronic testing is needed, 2) Improved video capture for asynchronous content delivery is needed, and 3) improved real-time conferencing with shared virtual white-board space is needed.

**Monitor the instructional spaces and teaching resources in the South Annex of SC, as those spaces come online, including standard ITS classrooms, as well as teaching laboratories and the new digitally-enabled collaborative learning space for team-based education. Work with staff and EFC to identify and correct any defects with those spaces. Report to the faculty regarding new teaching spaces.**

The new annex space was not yet fully operational in the fall semester, 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). The maker space room will need additional monitoring next year as it becomes fully operational. Many anticipated problems with space unfortunately did occur. The ETC identified that TV screens student design studio is too small & commented on this deficiency with ETS staff. The ETS staff provided some support for the new annex space under the limiting constraints of the construction contract.
Recommend specific charges for the 2018-2019 Engineering Technology Committee.

- In recognition that most departments do not have a formal 5-year technology plan, and under the recognition that technology is changing at a pace that is much faster than a 5-year cycle, we recommend rephrasing the first charge.
- Suggest that a catalog of teaching lab equipment and a replacement timeline/cost estimates be created to better understand the how to make future replacement/maintenance plans.
- 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.
- Monitor the implementation of the policy governing acceptable student behavior in the Engineering Computer Laboratories, and report on its effectiveness.