A White Paper
by the Technology Committee of ESF Faculty Governance

ESF's Digital Future

Report of the Technology Committee of ESF Faculty Governance

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ESF's Digital Future

Executive Summary

Technology at ESF plays a pivotal role in supporting the College's mission: to advance the knowledge and skills needed to promote effective stewardship of the natural and built environments. Remarkable advances in digital technologies are poised to combine with broader social and market forces to unleash a wave of "creative disruption" throughout higher education. ESF is not immune to this, and to continue to perform and expand its mission, the College will have to adapt to these new realities: in short, to navigate toward ESF's digital future.

This report reviews the current state of ESF's "technology profile" to evaluate how the College is currently equipped to face its digital future. "Technology profile" is broadly defined: it includes not only the technological infrastructure that is needed for the effective use of new technologies, but how this infrastructure is administered and used. "Digital future" is similarly broad in scope. It includes the commonplace notion of online education, but goes farther to encompass how technology can be used in innovative and imaginative ways to foster the College's core value: to be an intellectually vibrant scholarly community that is accessible to as wide a range of like minds as possible.

We conclude from this review that the College is, with qualification, well-placed to realize a bright digital future. There are many elements of a sound technological foundation in place: an energetic faculty that has a record of accomplishment in innovative use of digital technologies and is committed to excellence in scholarship; a student body that is increasingly comfortable with inhabiting the digital world; and considerable untapped opportunities that could be opened up to the College through digital technology. However, the College is hampered by funding constraints that have left the College's technology profile chronically underfunded, understaffed and underequipped for success. Administration of the College's technology profile is currently diffuse and unfocused. For a variety of reasons, the traditional course-based model of pedagogy has become entrenched at the College in a way that is self-reinforcing and that may impede the nimbleness and adaptability that would allow innovative modes of digital pedagogy to emerge.

We envision that ESF's digital future should be built around what we call the digital Seamless Scholarly Environment (dSSE). The dSSE includes:

- effective technological support of the traditional lecture, seminar and laboratory.
- new modes of digital pedagogy that go "beyond the course."
- collaborative digital communities that foster creativity, collaboration and inclusion across campus and beyond.
- seamless continuity between instruction and practice.
- digital media libraries and archives that can share information and media across campus and across the world.
- new models for delivery, evaluation and reward for creative scholarship in the digital world.

We follow this review with a set of recommendations that we hope will begin to address an interwoven series of issues. We do not regard these recommendations as a plan or a checklist, although they contain elements of both. Rather, we hope these recommendations will serve as the framework for an extensive set of conversations that we hope will allow the College to move into its digital future.

The recommendations are divided into three loose and overlapping categories: Administrative, Fiscal and Financial, and Cultural. Administrative recommendations designate actions where we believe Presidential and administrative leadership are essential. Fiscal and Financial recommendations designate actions to relieve the chronic shortfalls of funding and staffing that currently hamper development of the College's digital future. Cultural recommendations designate actions where leadership from the faculty will be essential. Some recommendations are specific, some are broader in scope, and some are invitations for further analysis and study.

Our aspiration for this report is that it will be a starting point, not an end in itself. ESF's digital future is both inevitable and hopeful. Navigating the way to that hopeful future will engage all sectors of the College's community: the creativity and intellectual drive of the faculty, the technical expertise of the staff, innovative management by administration, and the good will and community support of the Trustees. At the same time, the digital future will require re-examining old assumptions and openness to new models for building the College as a vibrant and exciting place to be, to study and to grow. We are hopeful that this document has set a constructive tone for the campus to begin moving forward together to ESF's bright digital future.

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Introduction

Technology at ESF plays a pivotal role in supporting the College's mission: to advance the knowledge and skills needed to promote effective stewardship of the natural and built environments. Meeting that mission is reflected in the College's strategic plan, *Vision 2020*, which lists seven strategic goals:

- Goal 1. Enrich academic excellence in both undergraduate and graduate education.
- Goal 2. Provide an outstanding student experience.
- Goal 3. Be the "go-to" institution with a strong and visible reputation.
- Goal 4. Become financially secure and independent.
- Goal 5. Strategically build and enhance partnerships and collaborative relationships.
- Goal 6. Respond to the needs of society.
- Goal 7. Invest in ESF's human resources and physical infrastructure.

These goals underscore the College's aspiration to be the pre-eminent environmental institution of higher education. They also reflect the College's long-held traditions of excellence in teaching, research and service.

Meeting these goals, advancing the College's mission, and upholding the College's traditions of excellence are the joint responsibility of the faculty, administration, staff and Trustees. Judgments on how best to meet these aims are necessarily colored by broader contexts, such as societal needs and expectations, or the demands of research sponsors and accreditors. These contexts also include the broader social, political and financial milieu in which the College and other like-minded institutions operate and compete.

In the time since *Vision 2020*, that climate has been changing dramatically. Escalating tuition rates, ever more burdensome student debt loads, increasingly politicized debate of scientific and social issues, and an increasingly fluid economy and job market has opened higher education to unprecedented levels of public scrutiny, skepticism and demands for accountability. Higher education is facing pressure to do what we do more openly, more cost-effectively and more attentively to the rapidly-shifting needs and expectations of the various clienteles we serve.

Over that same time, the advent of widespread high-speed data networks, along with the falling costs of production and distribution of data and digital media, has radically changed the operational climate for "information providers." These include print and broadcast media, but also, disconcertingly, institutions of higher education. Information providers generally, higher education included, are entering a newly Darwinian environment, where business models that had long relied on exclusive distribution and control of information are being undercut by the increasing ease and low cost of producing and distributing creative content. The resulting "creative disruption" that has been sweeping through the print and broadcast industries is plain for all to see. Higher education can expect to see similar creative disruption in the future. The

outcome of this creative turmoil is difficult to predict, but prudence dictates that higher education will need to adapt to these new realities. ESF is not immune to this.

This report is motivated by one basic concern: that maintaining and expanding the reach of the College's mission and upholding the College's traditions of excellence in teaching, research and service will have to account for the rapidly changing technological climate in which the College operates.

In this report, we will review the College's current "technology profile", which includes the technology infrastructure that currently exists, how effectively it works to advance the College's mission, and how the College is currently organized to use it. We conclude that while the College has considerable strengths in this area, it is poorly poised to meet the rapidly-approaching digital future.

The Technology Committee is drawn from several relevant constituencies on campus, including three senior faculty (Reuter, Turner, Winter), staff from the Office of Communications (Otteson), Instructional and Technology Services (Baycura), Computing and Network Services (Rounds), Outreach (Murphy), Moon Library (Webb), and Instructional Support (Ettinger). To more broadly gather opinions and other thoughts, the Technology Committee organized two open forums in the Fall 2013 semester, one for faculty (moderated by Turner), and one for students (moderated by Dr Chris Whipps, EFB). The Technology Committee also played a significant role in staging the 2014 Mentoring Colloquium in January, on the theme "ESF's Digital Future", which included several discussion sections that provided further opportunities for information. Finally, we conducted interviews with various faculty, technical staff, students and administrative staff.

We follow this review with a set of recommendations for shifting the College's technology profile to account for the realities of the new, and rapidly emerging, digital world. Our recommendations are based upon our evaluation of the College's current technology profile and how well (or ill) equipped the College is to move into the digital future. Our recommendations are shaped by two principles. First, that change is coming and survival in the newly emerging digital world will turn, not on resisting these new realities, but on adapting creatively to them. Second, that the surest guide for navigating our way into an uncertain digital future will be to empower and motivate the creative and intellectual core of our institution: the fundamental activity of scholarship.

Where things stand

ESF's digital future starts with a "digital present." Below, we outline the elements of the College's current technology profile, to assess how well (or ill) equipped the College is to move into its digital future.

Online education through Outreach

Administrative responsibility for online education at ESF currently lies with Outreach. Outreach has been the traditional home for online education at the College since ESF's engagement with the SUNY Learning Network (SLN). Recently, Outreach has begun new efforts to create a branded "ESF Online", with support from a Betsy and Jesse Fink Foundation Grant. Outreach also has significant responsibilities in two other areas: development and management of professional conferences, and K-12 education.

Table 1 (Appendix) summarizes online courses offered through Outreach since 2009 and their enrollments. The first courses to be offered were *Global Environment* and *University Outreach*, which ran in Spring 2009. In Fall 2009, *Concepts in Watershed Hydrology* was launched as a 1 credit online course. A NASA Global Climate Change Education grant focused on developing two new online courses around the topic of *Climate Change*. Two courses, a one-credit and a three-credit course, were developed and taught by Mr Dave Eichorn. The initial offerings of these courses targeted primarily non-matriculated students. Following that, several courses were developed or converted to online format with grant support through the Outreach office (highlighted in Table 1 in green). Other online courses have been developed by faculty under their own initiatives. With the launch of an official summer session at ESF, the number of courses offered online has gone up substantially. In summer 2011, four online courses ran, in the summer of 2012, seven online courses ran, and in the summer of 2013, 11 online courses ran. The vast majority of online students have been students already matriculated at ESF.

In summary, ESF now offers about 15 online courses. Most are offered in the summer to ESF students who are off-campus, and are looking for flex-time offerings of required courses normally taken during the academic year. Online courses have also been developed for Graduate Certificate programs and for grant-funded educational programs. Prof David Sonnenfeld offers an online course in partnership with the University of Wageningen and with advisement from SUNY COIL (Cooperative Online International Learning Center).

Ad hoc efforts at online education: some examples

In addition to the online courses facilitated by Outreach, there have been various ongoing *ad hoc* initiatives to develop digital course media and online course materials. By *ad hoc*, we mean online course and instructional media development outside the administrative purview of Outreach.

- **Dr Neal Abrams (Chemistry)** has spearheaded an endeavor that uses iPad mini tablets as the sole device for course-related content, in one section each in General Chemistry and General Biology. Students use a suite of apps to access online coursework and then develop their own content for submission and assessment. Dr Abrams' initiative is part of

a larger NSF-funded study on learning science through integrated lab experiences, Project SYNAPSE. Support for the iPads came through NSF funding, the Departments of Chemistry and Environmental and Forest Biology, and the Office of Instruction and Graduate Studies.

- **Mr Christopher Baycura** launched ESF TV in 2007, which has contributed to a number of the formal and informal *ad hoc* ventures into digital media and online instruction. These include managing a YouTube channel to distribute academic content to students and viewers worldwide, including *Global Environment, Physics of Life, Biology, English, Chemistry, Statistics, Marine Biology, Soils, Dendrology*, and *Library Information*. Additional programming includes featurettes on campus activities/events, athletics and a recurring interview series entitled Conversations. Most recent lifetime statistics for ESF TV indicate over 1700 subscribers, nearly one half million views, mostly from viewers in the United States, Canada and Great Britain.

- **Ms Jessica Clemons** (Moon Library) has incorporated iPods and other technologies into her *Information Litera*cy course to actively engage students in learning about the library. After the initial roll-out of these projects, other library faculty began including similar activities to enhance their courses, ultimately resulting in more students benefiting from Ms Clemons' initial efforts. Support for the iPods came through a Tier I SUNY Innovative Instruction Technology Grant received following this program's first call for proposals in 2012.

- **Mr Terry Ettinger**, Instructional Support Specialist/Greenhouse Manager for EFB, has recorded nearly a hundred three- to ten-minute video lectures for his *Plant Propagation* course, with the ultimate goal of "flipping" the course. Mr Ettinger is also exploring the use of self-produced video content to enhance the experience of visitors to the Illick Hall greenhouses, and to the greenhouse Facebook page. Mr Ettinger is also developing video materials to provide "how-to" support for greenhouse work-study students, and to document the operational details of Illick Hall's new greenhouse complex for Physical Plant maintenance staff.

- **Prof Dayton Reuter (LSA)** has established an extensive platform for collaborative computing for the Department of Landscape Architecture. This includes the LSA Computer-Aided Visualization Laboratory, departmental servers that provide network accessed content and shared storage for group projects and service learning work for LSA design studios, FTP server access for students working from both on- and off-campus, including those working abroad in the department's Off-Campus Program. This technological infrastructure has been built up since 1995, and is central to LSA's teaching: content in landscape architecture is often a composite of various visually rich media containing bitmap and vector graphics, text and AV content. The LSA digital infrastructure facilitates faculty feedback on student work through by through two-way file serving technology, coupled with PDF interactive forms and file markup capabilities.

- **Prof Scott Turner (EFB)** has developed a series of instructional videos to supplement classroom instruction for his course in *Physics of Life*. These include full-production "mini-documentaries", some shot on location at his research site in Namibia. Prof Turner is also converting his *Animal Physiology* course into a fully online course, Animal Physiology Online, set to launch in Fall 2014. Online instruction in this course will be

supplemented with personal interaction in recitations. Prof Turner also provides video instruction for two guest lectures in Diversity of Life, on symbiosis and social insects. Finally, Prof Turner is developing online course materials for science education in Namibia, as part of a cooperative program between SUNY ESF, Ben Gurion University, the Cheetah Conservation Fund (Namibia) and the National Museum of Namibia.

- **Ms Jane Verostek (Moon Library)** has, since Fall 2009, offered *ESF 200 Information Literacy* as an online course, for a total of 13 offerings to a total of 491 students. Semester enrollments have averaged 38 students, ranging from a high of 56 (Spring 2014) to a low of 9 (Summer 2011). Summer enrollments tend to be low compared to enrollments during the academic year. Ms Verostek has also developed a series of 37 video tutorials for her online course *Library 411. Video Tutorials.* These cover a variety of topics ranging from an introduction to the library, to use of catalogs, databases and other reference tools, to the best strategy to research and compose a research paper.

There are also numerous faculty throughout the campus that incorporate streaming video into their coursework, much of it content available through online providers such as YouTube, Vimeo, and Google.

Media and digital support resources

Shared resources with Syracuse University
The College currently has access to substantial resources to support the use of digital media in traditional and online courses. These are available to ESF faculty and students through a cooperative relationship with Syracuse University. These include:

- *Blackboard*, which has growing capabilities for media management in the context of course management and delivery.
- *Connect*, an Adobe web conferencing platform that provides the capability of mixed synchronous and asynchronous course delivery.
- *Ensemble*, a local media distribution platform for video, audio, images and documents. Ensemble has many powerful features, including searchable metadata, easy compilation of playlists, and automatic generation of html code for easy embedding and distribution of media assets.
- *EvergreenX* wireless network, which is controlled and managed from Syracuse University's data centers but we are allowed to connect some of our hardware to extend the network to ESF's campus in select locations.

These resources can be integrated with one another to provide a very powerful platform for media distribution and incorporation into course management. Currently, these are used largely to support education for matriculated residential students, but they could serve as platforms for online courses as well.

Resources through ESF
The Office of Communications manages an array of e-content media creation and online distribution services, including news and feature related video production, writing and editing copy, websites, public information systems, and external hosts. Social and other media outlets

include iTunesU collections, Facebook pages, LinkedIn groups, Twitter feeds, YouTube channels, blogs and more.

The College's Instructional and Technology Service (ITS) maintains a well-equipped video production facility. Resources include; fully functional multi camera studio/shooting space with black cyc and green screen, HD/SD recording and editing, and graphics compositing, After Effects compositing, a licensed music library, Blu Ray disk authoring, field production gear/lighting package and live content streaming. ITS also has primary responsibility for installation, maintenance and support of classroom media equipment in the College's approximately 70 classroom/meeting spaces on the ESF Syracuse campus. Fifty of these spaces are equipped with varying levels of electronic presentation technology, including LCD projection, sound amplification, media presentation systems, laptop connections and network access. ITS also manages a replacement schedule for this equipment, prioritized to serve the maximum number of students possible. Finally, ITS runs the ITS Help Desk, which provides immediate support for technological problems with the media systems in classrooms.

Public resources

There is a growing range of free social media tools for communication, collaboration, and synchronous conversation/webcasting. These include the familiar social media tools available in Facebook, Twitter, Google+ (including Google Hangouts) and Google Docs. Many classes and research programs on campus make extensive use of these resources. These resources also are upgradeable through subscription to include a wide range of capabilities including document sharing, media streaming, web conferencing and other synchronous educational tools.

Faculty and staff at ESF also have access to their own set of Google Applications using their ESF credentials, allowing for a more integrated experience.

Library

Moon Library strives to provide seamless access to scholarly literature at the time of need, and library staff are constantly seeking ways to improve the digital integration of library resources into the lives of faculty, students, and staff. The library already provides online access both on and off campus to scholarly literature and online research guides in addition to physical items located in the library. If someone can't find what they need, users can request the item through interlibrary loan. There are also a myriad of ways the campus community can seek help including face to face, twitter, texting, email, and online forms. In the near future the library will be implementing a discovery layer that will provide a method to search almost everything the library subscribes to in one search box. The library is also exploring ways to seamlessly integrate library resources into Blackboard.

Computing and technological resources

Computing and network resources are managed by Computing and Network Services (CNS), which manages the campus wired network (including network security), the campus wireless network (EvergreenX), the campus computing labs in Baker Laboratories and smaller computer clusters elsewhere on campus, computing resources, campus printing, and technical support for

administration, faculty, staff and students, through the CNS Helpdesk. CNS also manages campus software, including site licenses for computer operating systems (currently Windows 7), a variety of Microsoft productivity tools, including the Microsoft Office Suite, Visual Studio, and Expression Web, and analytical software like MiniTab. CNS also facilitates various agreements for discounted software for purchase for a variety of Adobe products, including Acrobat Pro and the various components of the Creative Suite. Licenses for the statistical package SAS are also available for purchase at a substantial discount through the Syracuse University bookstore. Funds for these purchases typically come from personal or research grant-related sources.

CNS supports technology at the College through a variety of dedicated and *ad hoc* mechanisms. The College assesses each matriculated student a Technology Fee of $162 per semester, which generates approximately $500k in annual revenue. From this, $24k supports ITS-IDEAS, and about $8k supports Information Systems and CNS. Other items supported by the Technology Fee include: support of EvergreenX; 1.6 FTE positions in CNS along with several student positions; internet connections to the Adirondack Ecological Center, the Ranger School and the two smart classroom renovations there; technology support for the Cranberry Lake Biological Station, including internet and laptop computers; major classroom renovations on the Syracuse campus, including Baker Laboratory classrooms; maintenance of the small computer clusters in Moon Library, Illick Hall, Walters Hall, the LSA design studio, and the Engineering computer clusters in Baker labs; service of the College's site licences for various software products; network maintenance; and replacement of public academic equipment.

Academic Equipment monies are also fed into the system, either directly through the Office of Instruction and Graduate Studies, although this is parceled out to a variety of recipients, with priorities usually determined by Departments. Some individual departments also administer local computing and technical resources through a variety of ad hoc sources, including funds from Academic Equipment funds and other sources, such as private donations. The GIS laboratory in Baker Laboratory is operated by Engineering.

The installation of EvergreenX began in 2005. Access to EvergreenX currently covers much of the main campus, but access ranges from limited to non-existent in several of the spaces on campus. The wireless signals in the east and west office and laboratory spaces of Illick Hall, for example, are too weak for EvergreenX to be useful there. The initial wireless deployments are currently not up to current standards or client loads, and are likely to fall behind further unless these are upgraded or replaced. Many buildings on campus are still in need of upgrades and updates to the network wiring systems. The cabling has aged poorly or was not installed according to modern specifications and cannot provide currently increasing requirements to the network.

Following a 2007 renovation to the spaces in Baker Labs, generator-protected power was shared between server systems in Baker Labs and critical needs for room cooling. In the event of a power failure, the Baker Labs server systems need to be shut down when cooling systems fail to operate.

The Office of Research Programs partially supports a high-speed computing facility in the Department of Chemistry. The various research grants won by ESF faculty contribute research

project-related technological infrastructure as appropriate to the specific project. Capital funds supported a roughly $2M upgrade in fiber optic cabling for the data and phone networks on the campus.

ESF's technology fee of $162 per semester for matriculated students is roughly in line with other SUNY colleges such as Morrisville or Oswego, but is considerably less than the technology fees assessed at the University center campuses (Appendix, Table 2). Technology fees, and the differential in fees between the SUNY Colleges and University Centers are set by SUNY policy, which lumps ESF with the SUNY Colleges, not the University centers.

A review of IT staffing loads also reveals noteworthy disparities between staffing levels at the College and other institutions (Appendix, Table 3). ESF supports 12 FTE IT staffers who serve more than 2,300 students as well as faculty and administration, for a service ratio of 193 students per IT staff FTE. This service load is less than it is for community colleges, and is roughly comparable to other SUNY Colleges. Compared to the IT staffs at the SUNY University centers and Syracuse University, ESF is considerably under-staffed.

Some departments, Landscape Architecture being a notable example, maintain their own large-format (poster) printing capabilities; intra-departmental networks for file sharing and collaborative computing; centralized archiving of student and faculty digital documents; and instruction in use of software like the Adobe Creative Suite, Rhinoceros and SketchUp 3D, AutoCAD and Autodesk Civil Engineering and ArcGIS. They are currently seeking to add support for 3D printing and digital model construction to their capabilities.

In addition to the CNS supported public computers and student printers in Moon Library, the college libraries provide students with several large-format scanners. Library staff serve as the first, and often the only, contact for most equipment issues that arise with CNS managed computers and printers located in the library.

Centennial Hall supports a wireless network for use by students residing in the dormitory space there. The College has no responsibility for managing the networks in Centennial Hall.

Administrative structure

Currently, the various aspects of information technology and the handling, production and distribution of media assets are distributed across the three Vice-Presidential administrative units at the College.

- The Provost and VP for Academic Affairs has responsibility for the College libraries, as well as allocations of Academic Equipment monies, which includes funding of certain aspects of the College's technology infrastructure.
- The VP for Administration oversees Information Technology (IT) and its three component units: Instructional Technology Service (ITS – video production, media support, classroom technical support), Computing and Network Services (CNS – wired/wireless networks, infrastructure, computing labs, faculty/staff computing support), and Information Systems (IS – secure administrative databases and portals).

- The VP for Enrollment Management and Marketing is responsible for the College's internet presence, including the web, social/external media and public information systems, as well as the vendor contract for Centennial Hall.

Pedagogy and technology at ESF

Instruction at ESF is overwhelmingly geared to what we designate "traditional pedagogy", which is centered on in-person delivery of instruction to residential students. Venues for traditional pedagogy include lectures, seminars, recitations, laboratories, field and studio.

Most courses at ESF use Blackboard (as provided and managed by Syracuse University) as a facilitator of traditional pedagogy, relying upon it mainly as a tool for managing course content, communication with students, links to outside sources, grade books and other of this program's basic features. The more advanced features of Blackboard that facilitate media distribution and online course delivery are rarely used in the College's regular course offerings.

Synchronous web-conferencing using such tools as Connect, Skype or Google Hangouts are rarely used in our mainstream course offerings. Dr David Sonnenfeld's joint online course with the University of Wageningen stands out as a notable exception in this regard.

Some curricula rely on intensive use of digital media. For example, the Landscape Architecture department maintains a graphics laboratory, with instructional staff support.

SUNY is moving forward with its initiatives for Open SUNY and Seamless Transfer, both of which have obvious connections to the development of online courses and other aspects of the College's internet presence. It is unclear at present how these efforts will impact the development of online instruction and research at the College. One clear impact has been the development of Open Textbooks. Presently, Dr Diane Kiernan (Forestry and Natural Resources Management) has published an Open Textbook under this initiative. Several other Open Textbook proposals by various College faculty are currently under review.

Traditional pedagogy relies on enabling the necessary contact hours between professors and residential scholars in physical venues. All are limited in time and availability, which requires significant coordination effort to manage. The College is currently bumping up against "brick-and-mortar" infrastructure limitations in some of its courses. This is most evident in large required service courses like General Biology. Because there is no lecture space on campus large enough to accommodate all the students that need these courses, courses such as this must be taught in multiple large lecture sections, with each lecture being delivered multiple times to different audiences of students. This overburdens faculty, increases student dissatisfaction and accrues 'lost opportunity' costs. Brick-and-mortar limitations are also made manifest in numerous scheduling conflicts that often close students out of desired classes or force them to take classes out of sequence. These constraints also limit the College's ability to expand the size of its tuition-paying matriculated student body, and limit the dissemination of these courses to a potentially wider fee-paying audience.

Finally, connectivity to the College's remote campuses remains problematic, which hampers the integration of academic activities at the College's remote campuses with the Syracuse campus.

Faculty incentives and disincentives

One significant component of the evaluation of faculty for promotion, tenure and other rewards focuses on effectiveness in traditional modes of scholarship. Measurement of faculty effort in teaching, for example, is based upon the full-time equivalent (FTE), which quantifies student-hours of contact time. This does not preclude, of course, evaluation based upon other intangible or qualitative indicators of excellence. Nevertheless, there is a strong push at ESF to quantify "effort" as an essential part of the tenure and promotion dossier. Faculty at SUNY are expected to teach the equivalent of eight 3-credit courses per year. In practice, this FTE requirement is parceled out in various ways, so that an FTE load may involve lecture time, time in laboratory or studio, advising, seminars, recitations, and so forth. Most faculty teach 2-4 traditional classes per year, although some teach much more. How online course delivery would impact these expectations is unclear at present.

Evaluation of faculty in research is measured by commonly-accepted metrics for excellence in scholarship, including publication record, research activity, grant support, indicators of collegial regard, such as invitations to conferences, contributions to books, awards, and so forth. Again, there is a strong push to apply more quantitative measures for these activities.

There are currently no policies in place of which we are aware to specifically incentivize faculty to incorporate the creative use of media and other digital technologies in their instruction and research. Products such as Open Textbooks presumably will be evaluated under the College's normal practices for scholarly productivity. Online courses, however, present unique difficulties and challenges which current procedures for evaluation for promotion and tenure may be ill-equipped to evaluate. Conversations with various junior faculty have revealed ambivalence and uncertainty about how contemplated online efforts will be judged. While there is no evidence of which we are aware that would indicate actual harm or discouragement of faculty wishing to incorporate digital technologies into their scholarship, the uncertainty remains, and should be accounted for.

Intellectual property

Under current [SUNY Policy](), materials developed by faculty for teaching and research are the unquestioned intellectual property of the individual faculty. Faculty are free to enter their intellectual property into publishing and distribution contracts as they see fit, and can develop independent income from that. The sole recognized exception to this is "work produced for hire", which is defined as specific work developed under the terms of a contract between SUNY and an individual.

These rights and terms have long applied to lecture notes, books, articles and other forms of traditional media. Recent revisions of SUNY's intellectual property policy extend the same intellectual property rights to electronic media as have always applied to more traditional media.

Intellectual property rights are different from distribution rights, however, and here is where issues may arise. Online courses will involve development of new forms of intellectual property in the form of electronic media, and it is unclear at present how these media can produce tuition-generating mechanisms that protect both the College's legitimate financial interests and

the faculty's intellectual property rights. These issues are likely to be critical as Open SUNY, seamless transfer, and SUNY's contract with Coursera come into broader play.

Summary: present state and future prospects

Our review of ESF's current technology profile reveals an institution that is reasonably well-placed to begin moving into the digital future, but that is hampered from doing so in several ways.

Among the advantages:

- College faculty and students currently have access to a wide range of technical tools, both hardware and software, which could support a significant expansion of the College's online and media presence in all facets of its mission: education, research and service.
- The unique character of ESF's mission presents substantial opportunities for expanding its online and media presence. This should enable the College to stake out a unique and competitive online niche, and from there to extend its mission to a much wider audience and clientele than it now does. The opportunities for expansion into national and international markets are especially great.
- Falling costs and increasing ease of use of tools for production and distribution of media are making it easier than ever for faculty to digitally realize creative visions for all aspects of their scholarship, for the College to advance and refine its online presence, and to present the College to the world online as a vibrant intellectual community. This can greatly enhance the College's marketing.
- The College faculty includes a strong cohort of "early adopters" of the creative use of technology and media in scholarship. These individuals could form a "critical mass" upon which the College can build to realize its digital future.
- Like all institutions of higher education, ESF draws on a student body that resides ever more comfortably in the digital world. This offers significant opportunities for the College to extend its offerings to students beyond the normal cohort of residential scholars.

Among the things that hamper ESF's progress toward its digital future are:

- The technology infrastructure at ESF has long been underfunded, understaffed and underequipped.
- There is no overarching strategy or consensus for moving ESF into its digital future. Where the College has made progress in online education and other creative uses of media in teaching, this progress has been *ad hoc*, contingent on the availability of funds from outside sources such as grants, or through the unsolicited initiative of individual faculty. These are all good things, but there is a question whether the College is institutionally equipped to use these efforts to the best extent.
- Technological integration of ESF's widespread campuses with one another remains poor. This hampers the ability of the College to leverage the assets available at the remote campuses to programs at the Syracuse campus and vice versa.

- Technology at ESF is governed by an incoherent and unfocused administrative structure that splits among the three Vice Presidents the essential components of production, distribution and marketing of ESF's digital presence that ideally should work as a coordinated whole. This has resulted in a lack of coordination, cooperation and focus on the use of technology to advance the College's mission.
- The faculty's governance structure is geared to facilitating and reinforcing traditional pedagogy. This can hamper the willingness of faculty to experiment with and adopt alternative pedagogical models that may be more suited to new methods of digital content delivery.
- There is no clear system in place to measure, reward, incentivize and monetize the creative use of technology in advancing the College's mission. This sets up a climate of perverse incentives that discourage the cohort of the faculty that is likely to be the most creative, energetic and risky in their use of technology, namely the junior faculty.
- There is no clear system in place for skills development and support to help faculty realize their creative visions in the digital world. Developing the necessary media tools and assets thus becomes perceived as just an added burden to be loaded onto an already overburdened faculty.

The way ahead

An overview

The Technology Committee has compiled a set of recommendations that we believe are necessary to begin steering ESF toward a viable digital future. The scope of the recommendations is broad and comprehensive, and extends beyond the bailiwick of technology *per se*. We believe strongly that this is what the scope must be, because the digital revolution that is currently underway in higher education touches on all aspects of how the College undertakes its mission. The College's response should be commensurately broad.

Throughout our deliberations, the Committee sought to keep its focus on the College's fundamental reason for being: a community dedicated to excellence in scholarship. "Scholarship" we define broadly to include all aspects of the scholarly life: teaching, study, research, development and creativity. While there are many uncertainties and challenges ahead, we believe that the surest guide to a successful future is for the entire community of ESF—faculty, students, administration, staff and trustees—to stay focused relentlessly on that ideal. Our recommendations reflect the Committee's striving to uphold that ideal.

Some explanation of the rationales for the recommendations is in order, both taken as a whole and individually.

A major challenge that the College will face will be adapting our traditions of excellence in teaching and scholarship to the newly emerging digital world. The College has long prided itself, correctly, on its comparatively small class sizes, small student/faculty ratio, and the ability that gives faculty to connect personally with our students and advisees. As we contemplate the unfolding digital world of MOOCs, online classes, "flipped" and "hybrid" classes, and streaming

media, there arises a legitimate and very real concern that this threatens to depersonalize our educational mission in a way that is detrimental to ESF's ideals. It is the Committee's strong position that the unfolding digital future offers more opportunities than challenges in this regard, and that the best way to ensure these opportunities are met in a way that upholds the College's scholarly ideals is to empower as much as possible the creative energies of its natural custodians: individual faculty.

Another major challenge the College will face is adapting its business and administrative models to the opportunities presented by the newly emerging digital world. Currently, these efforts are not always focused and coordinated on what should be the College's main goal: sustaining and presenting ESF to the world as an intellectually vibrant community of scholarship. The College will also have to think creatively about how to extend ESF's reach into hitherto untapped markets, both nationwide and globally.

Five premises

To flesh out these thoughts, we have outlined five premises that we believe should guide the College as it navigates into the digital future.

Premise 1. Higher education is a form of intellectual "content delivery."
Education is many things, but for the purposes of this report, it is a form of intellectual content delivery. As is the case for other content providers like print and broadcast media, higher education operates according to a particular business model to deliver content to paying consumers of it. We take it as a given that implementing excellence in pursuit of mission is predicated upon having a sound business model for content delivery, not only to pay for excellence, but to reward those who achieve it.

Premise 2. Higher education is a distinctive form of intellectual content delivery.
While higher education as a form of content delivery might be alike in some ways to other content providers, it is distinctive in several ways. However ESF's digital future develops, these distinctive qualities must be preserved. Among the distinctions:

1. The close, interactive and individualistic relationship between professor and scholar.
2. The dedication to stewardship of knowledge and to uncovering new ways of understanding the world.
3. The cultivation of a climate of dispassionate and free inquiry.
4. The obligation to serve the society that supports it.
5. The scholar's unquestioned ownership of intellectual property, and the rights and privileges that pertain thereto.

Premise 3. The future will be much different from the present.
Higher education's traditional modes of content delivery—in lecture hall, laboratory, studio and field—depend upon intellectual content being expensive, centralized, and access to it being relatively easy to manage. We are entering a future where information and intellectual content is diffuse, inexpensive to create and distribute, and access to it hard to manage and control. This has opened up higher education to opportunities and challenges it has never before faced.

Premise 4. The future will belong to the content creators.
Adapting to these emerging realities is not optional: the future will be owned by those that face the challenges and opportunities squarely and creatively. In the coming online world, it is content creation that will enable content providers to claim their rightful place in the future. Adapting to the new digital realities of the future will mean institutional commitments to creating content of originality, high production quality and unique value. The College's distinctive mission offers many opportunities for becoming a leading creator of intellectual content that can offer high value to the world.

Premise 5. The future might not be clear, but how it should come about is.
The specific topography of the coming online world is fluid and difficult to predict. Administrative models that imagine that it is and that seek to impose top-down management toward that imagined future are therefore likely to be ill-informed, misguided, dominated by institutional inertia, and ill-suited to the fluid and unpredictable digital future. The digital future will go wherever its most creative, innovative, nimble and adaptable individuals take it. Institutions' proper role in this will be to empower as much as possible the creative energies of the content creators: the faculty.

The digital Seamless Scholarly Environment (dSSE)

Re-orienting the College's technology posture will mean going beyond the commonplace notion of online instruction. Rather, it will involve a radical reassessment of how we are to function as a scholarly community in the digital future. We assert that the College's technology posture should be aimed at creating what we are calling a "digital Seamless Scholarly Environment" (dSSE). The vision of the dSSE is to create a technological infrastructure that seamlessly integrates digital technology with all aspects of the scholarly life at ESF. The dSSE encompasses:

- Effective technological support of the traditional lecture, seminar and laboratory.
- Fostering the innovative use of digital media that explores new modes of digital pedagogy.
- The creation of a collaborative digital community at ESF that fosters creativity, collaboration and inclusion across campus and beyond.
- A rethinking of how the College delivers, measures and rewards creative scholarship that is geared to the opportunities inherent in the digital world, among both colleagues and our emerging clienteles.
- A reorganization of the administrative structure for technology at ESF that refocuses the College's technology posture to sustaining the College's creative lifeblood—the faculty.
- Creation of a digital presence for the College that goes beyond marketing and public relations and is geared to presenting the College as an intellectually vibrant scholarly community with a unique mission and global reach.

Recommendations

We have parceled our recommendations into three rough categories: Administrative, Fiscal and Financial, and Cultural. These categories are arbitrary to a degree and overlap considerably, but the categories represent major areas where we believe progress could be made.

Administrative recommendations designate actions where we believe leadership from the President, administration and Trustees are essential. Fiscal and Financial recommendations designate actions to relieve the chronic shortfalls of funding and staffing that currently hamper development of the College's digital future. Cultural recommendations designate actions where leadership from the faculty will be essential.

We do not present these recommendations as comprehensive, as specific goals, or as a checklist. Rather, we present them as the starting point for what we hope will be a broad and inclusive conversation about the College's digital future.

Administrative

Recommendation: Bring technology at SUNY ESF under a coherent administrative structure that facilitates effective Presidential leadership and faculty empowerment.

The Committee encountered numerous and widespread complaints about how technology is administered at the College. Navigating to the digital future will mean having a technology profile in which various components—production, distribution, rights management, publicity, intellectual property, creativity—ideally should work coherently and seamlessly. We assert that the current administrative structure for implementing the College's technology profile does not do that. The President should lead a College-wide and inclusive reassessment of how technology is administered at the College, and take steps to bring it under a coherent administrative structure that focuses on empowering scholarship and projecting ESF as a vibrant intellectual community.

Recommendation: Develop a coherent marketing and monetizing plan for digital media and instruction.

Moving into the digital future will involve extending the College's reach to a potentially world-wide market, which could include both new markets for formal learners and new marketing opportunities for other informal consumers of the College's media products and messages. This could open up substantial new revenue streams for the College and faculty. Currently, there is no such plan in place of which we are aware. The President or his designee should develop, in consultation and cooperation with the faculty, a plan for extending the College's online and media presence in a way that offers mutual benefits and rewards for the College and faculty.

Recommendation: Bring development of online media and instruction into the mainstream of the College's intellectual life.

Currently, the responsibility for the development of online instruction rests with Outreach. Online instruction is presently a comparatively small part of Outreach's current bailiwick, and development has been limited by the availability of outside resources and the desire of students

for "flex time" offerings of required courses. We assert that there are extensive unmet opportunities at the College, both on the Syracuse campus and at the College's satellite campuses, for development of new modes of online instruction and for the creative use of technology and media in both formal and informal instruction in the "mainstream" of our curricula and courses. There are also considerable opportunities for the imaginative use of media for informal education and to project the College as an intellectually vibrant place. The President or his designee should develop, in consultation and in cooperation with the faculty, a plan to fully develop these extensive opportunities.

Recommendation: Resolve the administrative disadvantage that ESF currently faces within SUNY.

The technology infrastructure at the College is understaffed, underfunded, and under equipped to meet the demands placed on it. One of the obstacles to resolving this problem is a SUNY-imposed cap on the Technology Fee that is currently assessed on matriculated students. This stems from ESF's unusual status in the SUNY system: the College is a major research and doctoral degree granting institution, yet the College is not allowed to assess the same Technology Fee as the University centers. We assert that this is undue discrimination against the College, and it severely hampers the College's ability to build an appropriate technology infrastructure. The President should work with SUNY to resolve this discriminatory treatment.

Recommendation: Designate at least four of the College's graduate teaching assistantships as College-wide "Digital Media Fellows."

Digital Media Fellows would act as roving resources to assist the faculty in creation, production, and distribution of media for teaching purposes. Digital Media Fellows would be expected to qualify with a skill set that would enable them to carry out their responsibilities, either with skills already developed, or to be developed as a condition of appointment. Digital Media Fellows would also be expected to train their fellow graduate students in use and development of digital media.

Recommendation: Increase level of staff support to assist faculty as they integrate digital technology into their classrooms, laboratories and studios.

In addition to Media Fellows, effective production and implementation of technology and media into the classroom will require an increase in staffing levels dedicated to aiding faculty in the technical aspects of online collaboration, outreach, and implementing new models of pedagogy and research. This would put the College in line with similar instructional support departments at other institutions like SUNY Upstate, Hobart and William Smith Colleges, St. Lawrence University.

Recommendation: Develop a plan to implement the technological foundation of the digital Seamless Scholarly Environment.

The development of the dSSE as it is envisioned above will engage all aspects of the College community, but it will rest upon a technological foundation that involves sufficient server capacity, wireless and wired networks with sufficient bandwidth, sufficiently robust collaborative

platforms, appropriate network access, production capacity and appropriate software tools. This includes integrating the College's satellite campuses with the main campus. The President or his designee should develop a plan, in consultation and cooperation with the faculty and technical staff, to build the technological foundation of the dSSE.

Recommendation: Reassess the use and distribution of the College's Technology Fee.

The Technology Fee's stated purpose is to provide the funds to support offering students a high quality learning environment. Currently, the College's Technology Fee primarily funds student computer labs. In accordance with [SUNY's Policy](#) on "Fees, Rentals, and Other Charges," the Technology Fee funds could be used more broadly to improve wireless networks, equip innovative classrooms, automate student services and library use, public computing equipment (computers/scanners/printers, etc.), remote network access, and any other system that fosters a high quality learning environment. Therefore, we recommend a broadening of the comprehensive funding plan to include all infrastructure related to the student learning environment.

Recommendation: Reassess the College's expectations for students to equip themselves with a minimal "digital toolkit."

Developing digital media is only one side of the effective use of technology: "consumers" must be minimally equipped to access and use it. Presently, there is no expectation by the College that students will come to ESF equipped to use the digital technology we have, never mind the digital environment the College should be building. For the most part, this has not been a serious problem: falling costs for desktop and laptop computers as well as the wider use of portable digital tools like tablets and smartphones equip most students adequately to function in the College's digital environment. Nevertheless, occasional problems have cropped up with students not having the technological tools they need. We recommend the College consider requiring accepted students to come to ESF with a minimal digital toolkit that will enable them to function fluently in the dSSE. This may allow the College to start shifting Technology Fee funds from its current heavy investment in the computer labs to other critical needs.

Fiscal and financial

Recommendation: Raise the College's Technology Fee.

Currently, ESF students pay a Technology Fee of $162 per semester. A $200 increase in the Technology Fee would bring in a substantial revenue stream to support the technological implementation of the digital Seamless Scholarly Environment. We believe such an increase would be acceptable to students: students at an open forum convened by the Technology Committee expressed qualified support for the idea, the qualification being that they would have to see tangible benefits from it. We are aware that this is predicated on success at ending the SUNY-imposed cap on the fee.

Recommendation: Establish a Technology Innovation Fund to support development of innovative ideas using media in pursuit of the College's mission.

The envisioned Technology Innovation Fund would be a competitive program, similar in conception to the College's Seed Grant Research program or the McIntyre-Stennis program, and similar in scope to the competitive [Technology Fee Proposals](#) program at the Colorado School of Mines. Faculty would submit proposals to support the purchase of equipment, software or other justifiable expenses to develop capabilities and resources for creative use of media in teaching, research and service. Amounts would depend upon available funds, of course. For comparison, the Colorado School of Mines has such a program that supports grants from $3,000 to $40,000. A similar program at the College could be supported at first through funds from [SUNY's Innovative Instruction & Technology](#) Grants program. With a coherent and well-thought-out campus-wide plan in place, we believe the College would compete well for such support. Such funds would very likely be temporary. The College should therefore develop an endowment to sustain the Technology Innovation Fund.

Recommendation: Undertake a major capital drive for "ESF's Digital Future."

Seizing the opportunities for ESF's digital future will involve bold new thinking about education, research, service: all aspects that can make the College a vibrant intellectual community. We believe a sufficiently bold vision would be attractive to donors that could provide the capital and development funds that would be necessary to implement it and endow it. The President should make this one of the College's fundraising priorities, and should seek donors that can provide not only funds, but advice on production and distribution of digital media: partnering with the National Geographic Channel, Animal Planet, the History Channel, or similar media players.

Recommendation: Facilitate access of faculty and students to critical software resources.

Production of digital media requires access to critical software resources, including the various assets of the Adobe Creative Suite and Creative Cloud, other Adobe products related to online education like Captivate, other digital tools like Prezi, Camtasia Studio, and many other possible products. Most of these products offer substantial discounts for academic users, and some companies (like Adobe) are beginning to offer "rental" agreements (as opposed to permanent license) for their software products. Finally, many of these software assets can be made accessible through site license agreements to multiple users. The economics of equipping faculty and students with the critical software assets is complicated: it may be more economical at first to equip a few users with individual licenses, but there will be some critical number of users that will make site licenses more competitive. There should be a comprehensive plan in place that equips existing and potential developers of media assets with the software tools they need, and how best economically to do it.

Recommendation: Develop a strategy for delivering alumni-exclusive digital content as a means for encouraging/supporting their life-long learning goals while strengthening their ties to our/their institution, modelled, for example, after Harvard University's [plan to offer exclusive MOOCS to Alumni](#).

Recommendation: The Committee on Curriculum (CoC) should undertake a campus-wide review of protocols and standards for courses and curricula to facilitate innovation in educational content delivery.

Technology-enhanced instruction allows the effective delivery of educational content to a wider range of students and in a wider array of pedagogical models than is now possible under the traditional regime of set curricula and courses offered to residential scholars. Going "beyond the course" can open up the College's offerings to a much wider range of fee-paying potential students, for tailoring education much more closely to students' motivations and to the expectations of potential employers for informative credentialing. The Committee on Curriculum should undertake a comprehensive review of how our current systems of course and curricular review, standards and evaluation accommodate these new digital realities. The Committee on Curriculum should lead the various departmental Committees on Curriculum in similar reviews.

Recommendation: The College Committee on Promotion and Tenure (P&T) should undertake a review of criteria and standards for promotion and tenure to evaluate how our current practices recognize and reward innovative efforts by faculty.

New means of disseminating and developing scholarship in the digital world are sometimes ill-suited to traditional means of assessing scholarship quality, effort and likelihood for future scholarly development, and eligibility for promotion and tenure. For example, the distribution of effort in developing an online course differs significantly compared to traditional pedagogy. How will that be assessed? Similar questions arise for appropriately crediting skills development, forward development effort, teaching credit for online courses, and outcomes.

Presently, there is considerable uncertainty about how efforts undertaken to develop innovative online media and instruction will be evaluated. The College Committee on Promotion and Tenure should undertake a review of current standards for this, and lead the departmental Committees on Promotion and Tenure in a similar review.

Recommendation: The College should recognize and reward the innovative use of technology and digital media in furthering the College's mission.

The College faculty and administration should provide some formal recognition (a form of Academy Award) to those faculty who make outstanding contributions to enhancing the College's mission through technology and digital media. The award should include a monetary reward.

Recommendation: Create a campus wide digital media library that will provide access to ESF-created media assets across campus.

There currently exists on campus a large library of digital assets. These are currently distributed across several platforms, such as YouTube, iTunesU, Ensemble, Blackboard and others, and are typically used in discrete courses. Many of these assets could serve multiple courses, though, and it is currently difficult for, say, an instructor or student in one course to find potentially useful media assets from another course. We propose the creation of a College-wide

searchable "digital media bank" that could serve as a form of open library of media produced by faculty and students at the College that can be accessed by faculty colleagues and by tuition-paying students. The digital media bank would feature the systematic application of metadata, and would be governed by appropriate policies concerning rights and credits.

Recommendation: In consultation with administration, faculty should formulate coherent policies concerning the distribution rights, royalties and monetization of digital media assets.

SUNY policies regarding intellectual property rights clearly put ownership of intellectual property, including digital media and other assets in the hands of the faculty that create it. The rights pertaining to distribution, sale and royalties are less clear. It is the Committee's position that innovation should include financial rewards for success in the creation of intellectual property in whatever form, in a way that both protects the holders of intellectual property rights, and the legitimate financial interests of the College. In the digital future, this issue will become acute as the College extends its online reach to clients beyond the matriculated student body. The faculty should discuss and formulate clear guidelines concerning permissions, distribution agreements, and allocations of fees and access to ensure that intellectual property rights are properly protected and their use and distribution properly rewarded.

Recommendation: Create a College-wide repository to capture and provide future access to the scholarly output generated by the campus community.

Aside from the collection of dissertations and theses by Moon Library and the Graduate Office, there is no system in place to consistently capture scholarly output created on this campus. Current and historical faculty/student publications as well as research data are primarily stored on individual computers, located behind publisher's paywalls, or already lost. We recommend creating a college-wide policy to collect such information and make it available to the campus community.

Recommendation: Provide faculty with broader, more flexible and incentivized opportunities to gain practical skills in the production and implementation of digital media.

The production and implementation of digital media requires a set of skills that few faculty have had the opportunity to acquire. The Technology Committee has offered (and probably will continue to offer) an ongoing series of informal "brown bag" lunch sessions aimed at trading ideas and offering tutorials. Dr Dayton Reuter has long offered instructional sessions in the use of Creative Suite. The Syracuse University ITS department offers many training opportunities to ESF faculty to learn various skills related to use of software packages like Blackboard. These efforts, while very valuable, are necessarily limited by constraints of time, venue and schedule conflicts. There are various online training programs available (lynda.com is one of the best) that allow faculty to develop skills in self-paced training programs for an extensive set of applications. We recommend the College purchase a site license or implement some other crediting mechanism to allow faculty to develop skills as they need them, and to reward and recognize faculty that develop these skills.

Conclusion

ESF's digital future is both inevitable and hopeful. Navigating the way to that hopeful future will engage all sectors of the College's community: the creativity and intellectual drive of the faculty, the technical expertise of the staff, innovative management by administration, and the good will and community support of the Trustees. At the same time, the digital future will require re-examining old assumptions and openness to new models for building the College as a vibrant and exciting place to be, to study and to grow. We are hopeful that this document has set a constructive tone for the campus to begin moving forward together to ESF's bright digital future.

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Appendices

Tables

Table 1. Summary of online courses offered through Outreach and enrollments since Spring 2009. Cells tinted in green represent online courses developed from already existing traditional courses.

Course	Sp09	Fa09	Sp10	Su10	Su11	Su12	Su13
EFB 120: The Global Environment	4	3	1			14	12
EFB 796: University Outreach: Focus on Online Education	10	1	5				
FOR 296: Concepts in Watershed Hydrology		2	4	7			
ESC 200: Climate Change Science and Sustainability			3	10	8	9	
APM 104: College Algebra and Precalc					10	6	7
EWP 290: Writing					11	17	21
ESF 200: Information Literacy					8	19	16
EST 201: Am. History Reconstruction to Present						17	22
EST 296: Am. History Coloniz – Civil War						9	10
BPE 510: Intro to Polymer Coatings							1
BPE 511: Radiation Curing Equip, Inst, and Safety							1
EFB 496: Wetland Restoration Techniques							18
EFB 696: Wetland Restoration Techniques							10
LSA 496: Art & Environment in American Culture							6
Total Online Enrollments*	**14**	**6**	**13**	**17**	**37**	**91**	**124**

*Total online enrollments are total online course enrollments, and do not necessarily represent unique individuals.

Table 2. A sampling of technology fees charged at ESF and other universities and colleges.

Technology fee	per semester	per credit
SU (VPA, Art and Design)*	$520	
Virginia Tech‡	$495	$33
SU (VPA, Rhetorical studies)*	$450	
University at Buffalo	$396	
Northern Illinois University	$336	
Binghamton University	$320	
SU (Whitman School)	$200	
SUNY Oswego	$184	
Morrisville	$183	
SU (IS)	$175	
ESF (including Ranger School)	**$162**	
SU (Smith College of Engineering)	$150	
SU (Newhouse)	$150	
Georgia Tech	$107	
Colorado State University (Natural Resources)	$95	
Colorado State University (Natural Sciences)	$95	
Yale Forestry and Environmental Science	$70	

*Comprehensive fee
‡per credit hour, assumes 15 credit semester

Table 3. A comparison of Instructional Technology staffing at ESF and other colleges and universities. The Service ratio is calculated as Students FTE / IT Staff FTE.

College	Students FTE	IT staff FTE	Service ratio
ESF	**2,319**	**12**	**193**
Cobleskill	2,592	15	173
Delhi	2,767	15	184
OCC	10,637	35	304
CCC (Cayuga)	3,900	14	279
Alfred	3,539	31	114
Orange CC	4,310	25	172
Oswego	7,921	45	176
Cortland	7,056	42	168
Buffalo State	9,329	63	148
Syracuse University	21,300	155	137
Binghamton	14,501	80	181
Albany	16,307	125	130
Stony Brook	21,892	287	76

Links and references

Bass, Randy, 2012. Disrupting ourselves. The problem of learning in higher education. *Educause Review*. March April 2012: 23-33.

Technology Committee of Faculty Governance web page.

The Digital Campus. *The Chronicle of Higher Education*. 2 March 2012

SUNY Policy on Intellectual Property.

SUNY ESF TV

Colorado School of Mines Technology Fee program

SUNY Innovative Instructional Technology Grants

SUNY partners with Coursera

Open SUNY

SUNY Learning Commons

SUNY Policy on Fees, Rentals and Other Charges

Lynda.com

The Chronicle of Higher Education Wired Campus blog

Sherpa-Romeo (rights management) (Moon Library)

Monograph weeding project (collections management) (Moon Library)

New browseable journal list (Moon Library)

SUNY ESF Facebook page

Reynolds, G. H. 2014. *The New School. How the Information Age Will Save American Education from Itself.* Encounter Books.

Reynolds, G. H. 2012. *The Higher Education Bubble.* Encounter Books.