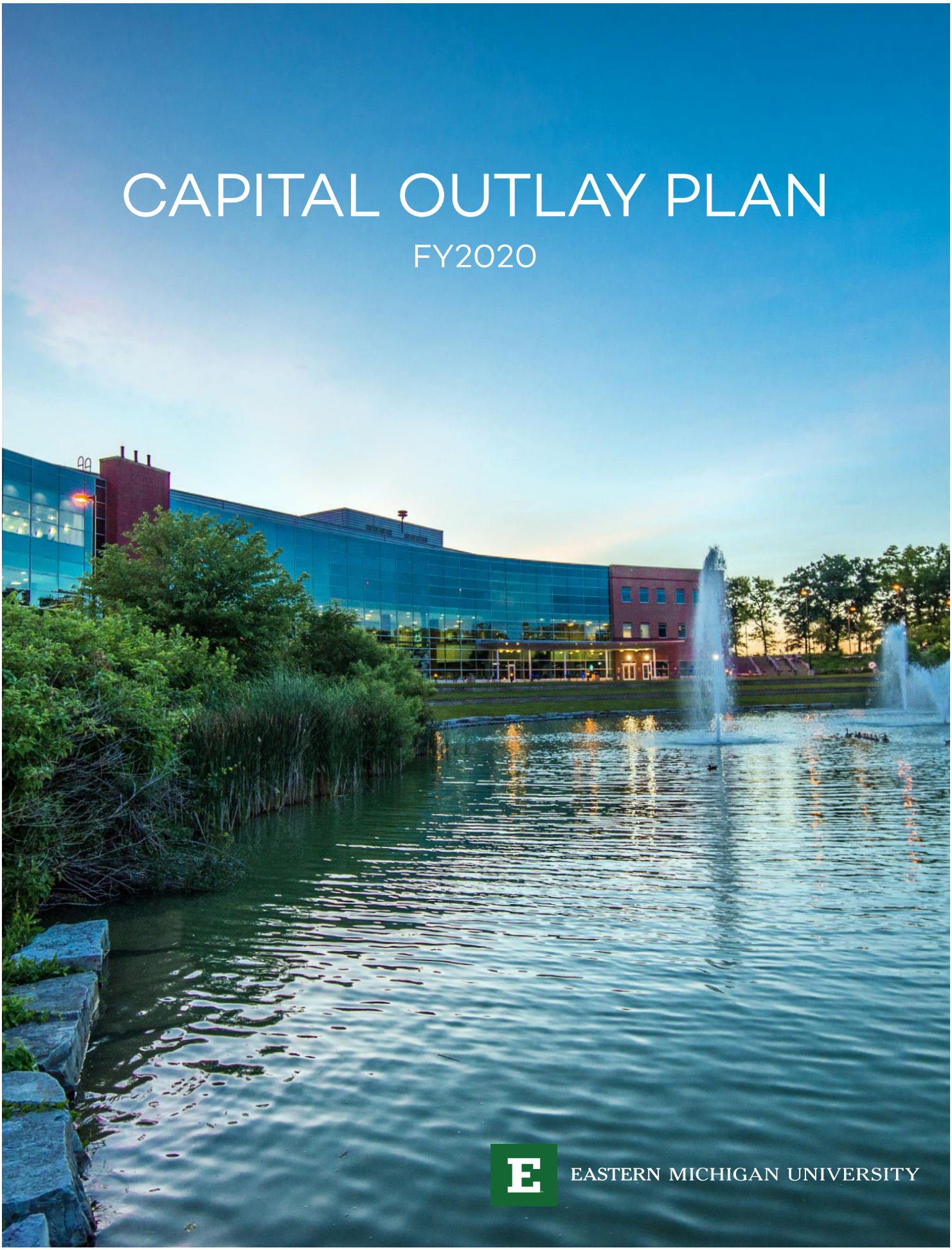
CAPITAL OUTLAY PLAN

FY2020



EASTERN MICHIGAN UNIVERSITY

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EXECUTIVE SUMMARY

(College Of Technology - Engineering Program Growth and Expansion)

Eastern Michigan University (EMU) is pleased to present this Capital Outlay Plan for FY 2020 in which the University outlines its request for funding for its **Engineering and Technology Complex – Phase 2**.

Established in 1849 as the Michigan State Normal School, EMU has played an important role in providing higher education to the students of Michigan, the Midwest region, the United States and countries around the globe. With approximately 87% of our students originating from Michigan and approximately 72% of these students remaining in Michigan following graduation, an investment in EMU is an investment back into the state of Michigan.

Throughout its history, EMU has enriched the lives of the citizens of Michigan by developing countless teaching, business, health and human services, technology and STEM professionals who have gone on to make meaningful contributions to society and the local and national economies.

The University has accomplished this by providing an exceptional learning environment that accommodates the diverse mission and specialized delivery of instruction that meets the expectation of our students and their parents, business and industry, and the state. An exceptional learning environment requires facilities that are up-to-date and can accommodate the technologies that are now woven throughout every discipline.

With the FY2018 full approval of the Strong Hall renovation project by The State of Michigan, EMU now turns our attention to the growing demand throughout Michigan for quality engineering students with our request for the College of Technology (COT) Engineering Program Growth and Expansion – Engineering and Technology Complex.

Through planning and benchmarking, the College has reviewed the current and planned programs and facilities to develop a program and Master Plan to support long and short-term COT goals. With expansions of and additions to existing programs, such as Mechanical, Electrical and Computer, Civil, and other Engineering programs, the College projects growth from the current 2,300 students to approximately 3,800-4,000 students (an increase of more than 65%) in the next ten to fifteen (10-15) year period. Demographic studies have indicated approximately 72% of our graduating students remain in Michigan for their careers.

The Engineering Program Growth and Expansion requires a two-pronged approach to (1) “right-size” the College for the current student population, and (2) meet the needs of an increased class size for approved and future planned program offerings.

The modernization and expansion of Sill Hall was identified as the first priority of meeting the Engineering Program needs and was submitted as our FY2019 State Capital Outlay Request. The urgency of the program needs, however, dictate an immediate start to this effort, and as such

that program will be funded through local capital efforts if the University's FY2019 Capital Outlay Request is not funded. The project would begin construction in January 2019 with a phased delivery method providing final completion in August 2020. This project only serves as the first step to "right-size" facility offerings for the current student population and academic programming. The high interest in the new and expanded engineering and technical programs demonstrated through increased enrollment has pushed the needs for the second step of our two-pronged approach: to provide advanced facilities for the growing class sizes and enhanced academic offerings.

Eastern Michigan University proudly presents our State Capital Outlay Request for FY2020, the Engineering and Technology Complex. The project includes a full renovation to Jones Hall to provide advanced engineering classrooms, discipline-specific laboratories and enhanced student collaboration and creative spaces, and an expansion of the facility to meet the initial growth needs of the Engineering and high-tech programs.

Condition Assessments have identified Jones Hall as among the top four University buildings in greatest need for renovation. Combining the programmatic improvements with new building systems, building envelope and learning environment will be the first step in meeting the Engineering Program needs.

The project will include full replacement of HVAC, plumbing, electrical and fire suppression systems, as well as use of modern, sustainable interior finish materials and systems. The project will be designed in compliance with the Americans with Disabilities Act, and will strive for LEED Silver certification. The project budget for this phase is $40 million.

The renovation of Sill Hall, although important to the Engineering Program, is only the first step to develop and expand a world-class engineering program to meet Michigan's needs for additional engineers; additional space will be ultimately needed. Immediately between the two major COT facilities (Sill Hall and Roosevelt Hall) stands Jones Hall. Originally constructed as a residence hall, and closed from use in 2005, the building has only seen use as temporary swing-space storage for equipment and furnishings from other capital projects. Now in severe need of renovation and restoration, the University has developed a plan to utilize large portions of Jones Hall, combined with selective demolition and a corresponding advanced-technology addition to provide not only the additional square footage needed in the future decades for the Engineering and Technology Programs, but also create a "Engineering and Technology" campus within the University's borders. This program-based campus approach will increase student interaction, provide for expansion of interdisciplinary instruction, and offer flexible learning spaces for modern and future teaching pedagogies. The additional areas also allow for future growth.

After renovating Sill Hall with local funding, the University intends to renovate Jones Hall as part of the State Capital Outlay program. Built in 1948 and containing 70,491 gsf, Jones Hall will take the lead in repurposing these classic structures for new use for the College of Technology's new Engineering and High-Tech Programs.

The adaptive reuse of Jones Hall is a goal and priority of EMU and the COT to develop and expand the Engineering and high-tech Programs. This project will include partial demolition of the east wings of Jones Hall to make way for a new 29,000 sf building addition in an open courtyard area. The addition will connect to the remaining 44,000 sf of Jones Hall through a series of ramps and connecting walkways over an open atrium separating the addition from the existing buildings. The open east exposure will allow for visual and physical connections to the existing Sill Hall creating a College of Technology micro-campus. The combined 73,000 gsf of additional space shall support the implementation and growth of new engineering programs.

Currently Jones Hall has over $27 million in deferred maintenance and asset preservation needs. While offline from use and mothballed to protect from weather damage, the condition and prime location of this building has led the University to seek alternative uses and planning solutions. This project will provide for a complete renovation of all building systems and components for Jones Hall as well as setting systems in place for the future full renovation of the adjacent Goddard Hall, potentially allowing for further growth of engineering program.

The projected project cost for the Engineering and Technology Complex is $40 million. Eastern Michigan has matching funding available through a variety of University sources. The combined facility will feature flexible uses for both instructional and research needs, as well as provide adaptability to future trends in engineering.

MISSION STATEMENT

VISION

CORE VALUES

MISSION

Eastern Michigan University enriches lives in a supportive, intellectually dynamic and diverse community. Our dedicated faculty balance teaching and research to prepare students with relevant skills and real world awareness. We are an institution of opportunity where students learn in and beyond the classroom to benefit the local and global communities.

VISION

Eastern Michigan University will be a premier public university recognized for student-centered learning, high quality academic programs and community impact.

CORE VALUES:

Excellence - We provide an exceptional environment to our faculty, staff, and students. We improve our performance continuously and strive to be the best in everything we do.

Respect – We care for our people, communities, and the environment and show respect for the dignity of the individual.

Inclusiveness – We create an environment that supports, represents, embraces, and engages members of diverse groups and identities.

Responsibility – We are accountable – individually and in teams – for our behaviors, actions and results. We keep commitments.

Integrity – Integrity and transparency are critical to our institutional effectiveness. We pursue the highest level of personal, intellectual, academic, financial, and operational integrity within the University community.

INSTRUCTIONAL PROGRAMMING

EXECUTIVE SUMMARY

THE COLLEGES

OTHER ACADEMIC UNITS

EXECUTIVE SUMMARY

The University was founded by the State of Michigan in 1849. Then called Michigan State Normal School, its primary purpose was to educate teachers. In 1956, Michigan State Normal College became Eastern Michigan College, and in June 1959, then comprising three Colleges and a Graduate school, it became Eastern Michigan University.

Today, Eastern Michigan University is a comprehensive Undergraduate and Graduate institution, offering over 140 Undergraduate majors and curricula leading to a broad spectrum of Baccalaureates and over 130 Graduate concentrations leading to the Master's, Specialist's, and Doctoral degrees. Its focus is on preparing students to succeed beyond graduation by emphasizing a personal approach to education in which the student is the center of the learning experience. The University prides itself on putting "Education First."

The University is fully accredited by the North Central Association (NCA) of Colleges and Schools. More than 100 national and international professional organizations provide focused accreditations at the college, department, and program levels.

The University's Division of Academic Affairs comprises five academic Colleges: the College of Arts and Sciences (CAS), the College of Health and Human Services (CHHS), the College of Business (COB), the College of Education (COE), and the College of Technology (COT). The Division is further supported by a comprehensive Honors College, Engage EMU, and the Bruce T. Halle Library (LIB).

THE COLLEGES

College of Arts and Sciences

The College of Arts and Sciences (CAS) was established in 1959-1960 during the academic year EMU became a University. The College currently is the largest in the University, with 18 Departments (Art; Africology and African American Studies; Biology; Chemistry; Communications, Media and Theatre Arts; Computer Science; Economics; English Language and Literature; Geography and Geology; History and Philosophy; Mathematics; Music and Dance; Political Science; Physics and Astronomy; Psychology; Sociology, Anthropology and Criminology; Women and Gender Studies; and World Languages). Graduate Studies in the College expanded rapidly from two degrees in 1960 (History and Literature) to degrees in all departments by 1969. Beginning in Fall 2001, the College offered a Ph.D. in Clinical Psychology, the first Ph.D. at Eastern.

For a perspective of the size and complexity, the College of Arts & Sciences:

- Generates more than half of EMU's student credit hours.
- Employs slightly more than half of the University's faculty.
- Uses all or part of 13 buildings.
- Offers nearly all of the general education courses, which provide the foundation for specialized work in major programs.
- Supports 6,000 sections annually for more than 1,800 courses.
- Maintains over 100 Undergraduate and 70 Graduate programs.
- Includes over 7,000 Undergraduate and 900 Graduate majors each year.
- Awards more than 1,200 Undergraduate and 300 Graduate degrees annually.

The College is also proud of the following attributes:

- It exhibits student research and creativity in its annual Undergraduate Research Symposium.
- Maintains the federally funded (a) Sailing Ocean Literacy Grant; (b) DUETS Urban Education Grant; (c) Gear Up Higher Education Preparation Grant; (d) TCATTE English-As-A-Second-Language Grant; and the (c) Creative Science Inquiries Experience Program (CSIE).
- Hosts the Institute for Geospatial Research (IGRE) has received major grants from NOAA, Michigan Department of Natural Resources, NASA, and NSF.
- Every Department in the College participates in the education of teachers through specific methods course offerings.

College of Health & Human Services

The College of Health and Human Services (CHHS) prepares professionals with the knowledge and skills to enhance quality of life for Michigan residents and facilitate social change. The college's schools include: Health Promotion and Human Performance, Health Sciences, Nursing, and Social Work. The College of Health and Human Services is located in the Porter Building, the Warner Building, Roosevelt Hall, and the Marshall Building. Administrative space is provided in the Marshall Building for the Dean's office and three of the four schools, as well as laboratories and classrooms for the whole College. Roosevelt and Warner provide classroom and laboratory space, and Porter houses the School of Health Promotion and Human Performance.

With the State of Michigan's push to support health and human service programming, the population of undergraduate and graduate students has increased in the college, becoming the second largest at EMU. Classroom and office space is at a premium. There is a possibility of increasing the number of students in some of the existing programs as well as adding new programs if our need for more classroom, laboratory as well as research space is met. Furthermore, the CHHS has hired new research faculty over the past few years, and with the 2009 addition of a doctoral program in Nursing Education, steady expansion of faculty/student, interdisciplinary-research collaborations are anticipated. The first class of students in the new Physician Assistants program entered in 2014. The program's facility needs were met with an upgrade to Rackham Hall and a unique partnership of sharing space at St. Joseph Hospital. Under these circumstances, the CHHS has proposed a three-prong strategy to address its facility needs.

- First, the Warner facility is in need of major renovation: heating and cooling, classrooms, existing labs, etc.
- Second, acquiring additional space in the Bowen, Warner buildings, and/or future expansion to the Marshall Building, for office and research needs is critical to grant acquisition and contract services for on and off-campus constituents as well as to meet accreditation requirements.

To address the first component of the CHHS strategy regarding the Warner building, a multi-disciplinary Running Science Laboratory provides central coordination and support services to researchers. The center is comprised of a variety of laboratories such as movement technology, performance testing, simulation, sensory integration, body composition and wet laboratories. Currently at EMU, similar research institutes, such as the Coatings Research Institute, thrive and can serve as a model for this endeavor.

While most proposals will serve one or two major research efforts, this one benefits a College whose percent increase in enrollment and new faculty hiring outpaces the rest of the campus.

EMU has made a strategic decision to grow research capacity. While EMU has been a stellar, accredited, comprehensive university for nearly 170 years, it enjoyed 75% state support in the

1970s and now receives on average 20% of its revenues from state funding. Seeking revenue from grants and contracts to achieve our mission has become an important goal.

Several programs in the College of Health and Human Services are accredited by disciplinary organizations, which frequently list standards for quality of program space especially with regards to research space:

School of Health Promotion and Human Performance - Athletic training accredited by the Commission on Accreditation of Allied Health Education Programs and the Joint Review Committee on Education Planning and Athletic Training; health education accredited by the Michigan Department of Education/National Council for the Accreditation of Teacher Education; orthotics and prosthetics is accredited by the National Commission on Orthotics and Prosthetics Education; physical education is accredited by the National Association of Sport and Physical Education/National Council for the Accreditation of Teacher Education.

School of Health Sciences - Clinical laboratory sciences program accredited by the National Accreditation Agency for Clinical Laboratory Sciences; occupational therapy accredited by the Accreditation Council for Occupational Therapy Education; dietetics accredited by the Commission on Accreditation for Dietetics Education of the American Dietetic Association.)

School of Nursing - Accredited by the Commission on Collegiate Nursing Education.

School of Social Work - Accredited by the Council on Social Work Education.

Physician Assistant Program – Accreditation-Provisional status granted by the Accreditation Review Commission on Education for the Physician Assistant.

College of Business

The College of Business was formed in 1964 and has grown to be the third largest college at Eastern. Branded as "Innovative, Applied and Global", it has been selected as one of the "Best Business Schools" every year since 2003 by the *Princeton Review.* The College is accredited by the AACSB (The Association to Advance Collegiate Schools of Business International), a distinction shared by only 30% of U.S. Business Schools. The College offers 12 Undergraduate majors, eight Undergraduate minors and five graduate degree programs in four departments: Accounting and Finance, Computer Information Systems, Management, and Marketing. It is the only Business school in the country to offer a Master's of Science in Integrated Marketing Communications program and offers the only Graduate program in Human Resources in China. Its Professional Education Center provides executive education for a variety of corporations and non-profit organizations. The College is supported by 13 business advisory boards to ensure the relevancy of curriculum and to increase interaction with the business community. Additionally, the College has partnership agreements with Universities in China, Korea, India, Malaysia, Pakistan, Germany, France, Spain, Belgium and Yemen.

The region's economic development has been enhanced through centers of excellence within the College of Business. The Center for Entrepreneurship is specifically intended to support the development of new enterprise in the region and provide no-cost services to entrepreneurs and small businesses. The Center houses the SBA Small Business and Technology Development Center network (SBTDC). The SBTDC operates four offices covering the metro-Detroit area (Wayne, Oakland and Monroe counties). Typically these offices provided services to over 750 clients, training to over 2,200 people and helped start dozens of new businesses. The Center also sponsors an Annual Collegiate Entrepreneur Organization (CEO) student organization and the Annual SESI Midwestern Entrepreneurship Conference. Annually about 300 High School, Community College and University students attend the Conference. The Skandalaris Business Plan Competition with cash prizes sponsored as part of the conference attracts almost 100 plans from High School, Community College and University students.

To further the mission to enhance regional economic development the COB has also committed a suite of offices on the third floor of the Owen Building to establish the Office of Business Partnership Program. These offices house the Regional Headquarters of the Michigan Small Business & Technology Development Center (SBTDC); the Southeastern Michigan U.S. Export Assistance Center; the Center for Entrepreneurship; the Biz Resource Center for small businesses and students; and the Washtenaw County, Ypsilanti SmartZone Center. The College was instrumental in opening a Business Incubator partnering with Ann Arbor SPARK, a regional economic development organization, about 100 yards from the College. The Strategic Human Resource Management Center has been providing Human Resource Management education and certification to professionals throughout Southeast Michigan for more than nine years, receiving multiple awards and recognition from the National Society for Human Resource Management. Other new strategic initiatives include programs in Supply Chain Management, International Business, Integrated Marketing Communications and Entrepreneurship.

The College is the first business school in the country to develop an “Ethos Statement”, a strong statement of ethics and values to foster a professional culture within the College. This statement is attached to every syllabus for every course offered in the College.

The College of Business is currently housed in the Gary Owen Building, built in 1990, and situated on Michigan Avenue roughly one mile from EMU’s Main campus. This building comprises the instructional facility for approximately 2,800, both day and evening, who represent the ethnic and socio-economic diversity of the region as well as having a significant international component. The College of Business continues to experience a rich diversity within its Undergraduate and Graduate students. The University’s international student population represents 41 different countries, many of which are also represented at the College of Business. The Graduate programs are offered at night along with Undergraduate courses that allow Undergraduate students to complete their degree programs.

The College is in need of modernization. The increased interaction with the business community, economic development activity and professional education also raises the need to have a more professional business facility. Currently, there is no true “entry” to the College. There is only one executive classroom and no student lounge area. There is no library, student center or even adequate study areas for the students to study between classes. The lunch area has a maximum capacity of 50. This is inadequate to service the over 2,200 undergraduate and 600 graduate students. Because of the distance from the main campus all of the students are “commuters”; it is just a matter of how far they commute. A modernization or relocation of the College of Business to the main campus continues to be considered as a major priority for future Capital Outlay allocations.

College of Education

For more than 165 years, Eastern Michigan University's College of Education (COE) has played a major state and national role in the preparation of teachers, other school personnel and related professionals. Eastern has an historic and valued place as the first "Normal School" West of the Allegheny Mountains. Eastern was among the first institutions involved with the preparation of physical and special education teachers. The College of Education is one of the nation's largest preparers of professional education personnel, offering programs at the Bachelor's, Master's, Specialist's and Doctoral degree levels. The College's programs have received a number of national recognitions, are fully accredited and are Charter members of the National Council for the Accreditation of Teacher Education (NCATE), and are approved by the Michigan Department of Education. In almost every instance where a program-specific national recognition exists, the EMU College of Education holds this recognition at the highest level.

Through its Office of Urban, Community, and International Outreach (OUCIO), the College has created numerous partnerships with local school districts that are interested in enhancing a variety of school improvement activities. The OUCIO has also established strong new partnerships with the Detroit Public Schools and the Charles H. Wright Museum of African American History. The office supports a growing number of international partnerships and programs and is home to two distinguished Chairs—the Morris Chair and the Porter Chair. Additionally, the OUCIO and its Minority Achievement Retention and Success (MARS) Program have been instrumental in the recruiting, retention, and achievement of our minority students.

Graduates from the College of Education are highly prized and are aggressively recruited at the national level. Our alumni hold many distinctions, including the Pulitzer Prize, National Student Teacher of the Year and National Teacher of the Year, and serve as presidents or executives of major national professional organizations. In addition, 26 COE graduates have received the prestigious Milken Family Foundation Award for teaching excellence in the classroom. Finally, over 500 of our students become certified teachers each year.

In July 1999, the College of Education was relocated to the John W. Porter Building. This building was a $13,816,000 renovation of the former campus library that was authorized in Public Act 19 (P.A. 19) of 1993. Since 1999 college resources have been used to refresh and address expanded technology needs. With continued and additional expansion of technology and users, the facility requirements for the EMU College of Education is being addressed through a more stable refreshment program as we continue to deliver our comprehensive and diversified academic programs.

Most programs in the College of Education are nationally accredited by disciplinary organizations, which frequently list standards for quality of program space:

Department of Leadership and Counseling - Leadership programs are accredited by the National Council for the Accreditation of Teacher Education. Community, college and school counseling programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs.

Department of Special Education - Speech-language pathology program accredited by the American Speech-Hearing Association; hearing impaired program accredited by the Council on Education for the Deaf. The department is nationally accredited by the Council for Exceptional Children and the National Council for the Accreditation of Teacher Education.

Department of Teacher Education - Accredited by the National Council for the Accreditation of Teacher Education, the Association for Childhood Education International, the International Reading Association, and the National Association for the Education of Young Children.

College of Technology

The College of Technology (COT) is dedicated to excellence in the delivery of 27 professional programs in Mechanical Engineering, Applied Engineering Technology (10 programs), Applied Management (10), Applied Design (5) and in Military Science and Leadership. In 2017, the University's Board of Regents approved new programs in Mechanical, Computer and Electrical Engineering. In 2019, the University expects to bring requests for the approval of new programs in Civil Engineering. These new programs provide further evidence of the University's dedication to building out a comprehensive engineering program within the COT. The COT is also proud of its research and training activities in textiles, polymers and coatings, and police and fire staff training. Program offerings are based on the philosophy that applied, project-based problem solving enhances learning and that application of knowledge is a key driver in the creation and discovery of new knowledge. Graduates of COT programs are well prepared to function in an ever-changing, global technological environment and to assume leadership roles in organizations, corporations, government agencies, and institutions of higher education throughout the world. Today's COT has become an integral component of the University's mission, allowing students to be better prepared to compete globally. With a reputation for achievement and innovation, the College of Technology continues to meet the changing needs of students and employers. COT programs are ideal engines for addressing state and federal government's priorities for enhancing Science, Technology, Engineering and Mathematics (STEM) education and the country's STEM-educated work force.

The University and its Board of Regents recognize that the creation of the new Mechanical, Computer, Electrical and Civil Engineering programs is important as it represents a growth opportunity for the University. Beyond the campus, these programs are important as the graduates of these programs are in high demand within the state's employment needs and demographics. By modifying existing programs and creating new programs, College of Technology faculty respond quickly to industrial demands for trained professionals. A great barrier to program development is the shortage of appropriate facilities and the less-than-adequate teaching and laboratory environments for instructional and research activities.

The College of Technology operates within three buildings.

- The Coatings Research Institute (1987; 8,000 s.f.), the newest building, is small and only provides laboratory spaces for coatings research and analysis.
- Sill Hall (1965; 92,635 s.f.), the largest building, was originally programmed for fine arts and industrial arts activities. Today, the industrial labs are still used for engineering technology and construction management courses, but the fine arts spaces were long ago converted for computer, electronics, and chemical laboratories, and classrooms. The University will fund a project to modernize, update and expand Sill Hall if it is not funded through the FY2019 State Capital Outlay process. This project will be complete for the Fall 2020 semester.
- Roosevelt Hall (1924; 75,639 s.f.) was originally programmed as a high school. In 1973, it was renovated to accommodate Military Science and home economics activities.

Today, many of the spaces have been renovated again, with various levels of success, to accommodate computer laboratories, design studios and classrooms.

EMU will, if necessary, address the needs of Sill Hall with a $40 million self-funded capital project. However, even when completed, the University will still be undersized for engineering program space compared to peers and industry averages.

In 2016, the University commissioned a planning study for the College of Technology. The planning effort created a Micro-Master Plan for the college addressing current shortfalls in space allocation and facility condition and abilities, as well as providing options to meet current and planned growth for the new and planned programs such as the engineering and technology programs. The Micro-Master Plan recommended several small, short-term projects, as well as focused attention and detail to four major renovation and expansion projects:

- Renovation and expansion of Sill Hall; to "right-size" facility space and infrastructure for current programs and the immediate needs of the added engineering programs,
- Renovation and expansion of the offline Jones Hall to create a new "Engineering and Technology Complex" to meet the long-term needs of the newly added engineering programs, and growth in high-tech computer information, robotics and unmanned or autonomous vehicles,
- Renovation of Roosevelt Hall to right-size and upgrade facilities for many of the other associated programs within the College of Technology, and
- Renovation and expansion of the offline Goddard Hall (adjacent to Jones Hall) to provide planned additional space for the "Engineering and Technology Complex" to meet the planned and anticipated growth needs of these high-tech disciplines.

The College projects growth from the current 2,300 students to approximately 3,800-4,000 students (an increase of more than 65%) in the next ten to fifteen (10-15) year period. Demographic studies have indicated approximately 72% of Eastern Michigan students stay in Michigan for their careers.

In summary, COT programs and courses require significant hands-on laboratory resources. COT has done well in maximizing its use of its presently allocated space; however, to truly allow students to achieve their potential as STEM-educated graduates, provisions must be made for program growth and modernization of program spaces and infrastructure.

Other Academic Units

Engage EMU

Engage EMU (EE) provides leadership to the campus in extending Eastern Michigan University to its communities. As the primary delivery structure for off-campus programs, EE works closely with academic departments and colleges as well as student service areas to serve students both on campus and beyond. Because its programs are offered off campus, we have no short term capital outlay requests for EE.

EMU programs offered via EE are varied in both geographic distribution and program type. Courses are offered in traditional and compressed formats, distance learning, and contract programs. Off-campus centers are maintained in Detroit, Livonia, and Traverse City. Courses and programs may also be delivered at non-EMU locations such as Grand Rapids in partnership with Grand Valley State University, Daimler Chrysler, and Foote Hospital, to name a few. Programs are also offered internationally in partnership with foreign institutions, for example the Human Resource and Organizational Development Master's degree in China.

EE is also responsible for EMU-Online, Eastern Michigan's online course delivery unit. More than 350 courses have been developed and enrollments are increasing annually. Ten full degree programs have been developed for online delivery.

EE continues to expand within the region, and internationally. EMU-Livonia continues to serve the off campus student population. In addition to the partnership with the Tianjin Normal University, there are discussions with other potential university partners in China interested in Geographic Information Systems (GIS) and Quality programs. These programs can be delivered in a hybrid format, face-to-face and online, and help further the internationalization of the curriculum and broaden the knowledge and experience of the faculty.

On campus, EE delivers programming on weekends using various campus buildings and the Eagle Crest Conference Center. In addition, technology can be used to deliver programs between campus and distance sites.

EE also provides a number of non-credit offerings which meet the life-long learning needs of the southeast region of Michigan.

Library

The Bruce T. Halle Library houses the University Library, Bruce K. Nelson Faculty Development Center, Holman Learning Center, Academic Technology and Computing Services and Eagle Cafe. With over 949,000 volumes, 200 indexes and databases, and 20,000 full-text journals, the library provides an array of resources that supports teaching, learning and research to facilitate the intellectual, scientific, artistic, cultural, and service pursuits of the University. The 273,715 square foot library offers 2,250 seats for faculty and students, over 500 computers in labs and public areas, 1,500 network ports, and wireless access to Internet throughout the Library.

At the time when Halle Library opened in 1998, several decisions were made due to budget constraints: (1) to limit the size of the Automatic Retrieval Collection (ARC), (2) to limit the size of the University Archives, (3) to forego proper environmental controls in the University Archives, and (4) to forego proper environmental controls in the "Head End" room which houses major servers, network infrastructure, and the like.

A capital project to meet the full capacity of the Automatic Retrieval Collection (ARC) has been completed. The addition of two (2) bays increased the capacity of the ARC by 200,000 volumes. There was also an update to the ARC's decade-old hardware in the project.

The University's interest in showcasing its accomplishments and the desire to expand the conception of the University Archives to a digital repository both require different and more significant space utilization than the current area provides. Every year that we delay proper environmental controls for these materials is decreasing their life expectancy. A state-of-the-art Archives/Special Collections area with room for a public exhibit and museum-like display area would cost approximately $1,725,000. Remodeling and expansion of the current site could be done for $500,000-$750,000. A recent project addressed the needs of the environmental controls within the archives.

Approximately $1,000,000 would be needed to add necessary levels of electrical power and air conditioning in the Head End Room, as well as to replace the outdated sprinkler system with a fire suppression system more appropriate to a room housing so much high-tech equipment. We have been fortunate in avoiding major system failures or fires in that room to date, but the safety risks and the potential for system failure are of continued concern.

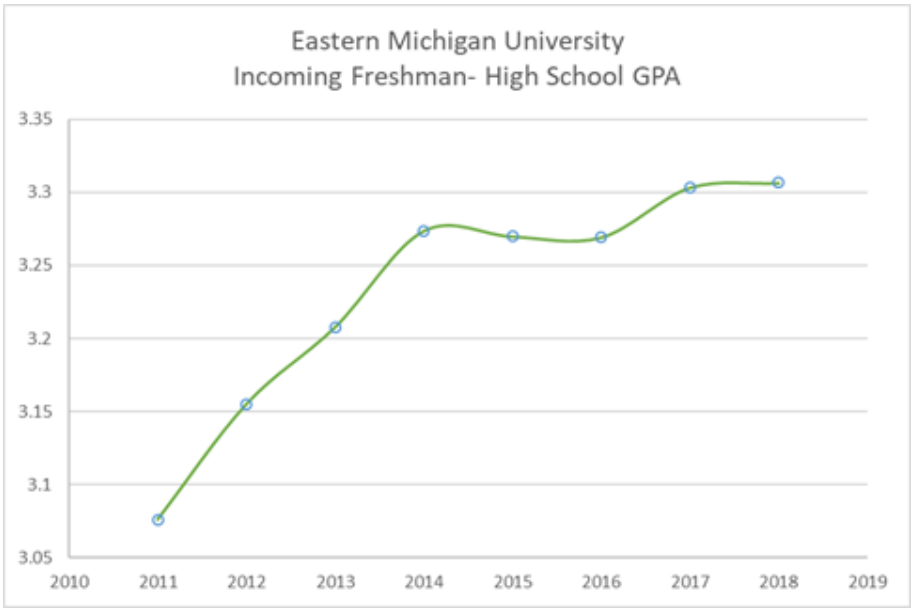
The Halle Library is now eighteen years old, and was used heavily in FY2012 as "swing space." Worn carpeting was noted as far back as the 2006 program review of the library, and carpeting is even more worn since the end of the "swing space." Furniture has worn out, and paint has faded. There has been continual rethinking of the use of space, but minimal monies available to do the changes in a manner that befits the stature of the building on the campus. Approximately $1,000,000 is still needed to catch up on the routine maintenance of the building that had been delayed.

ENROLLMENT AND FACULTY/STAFF

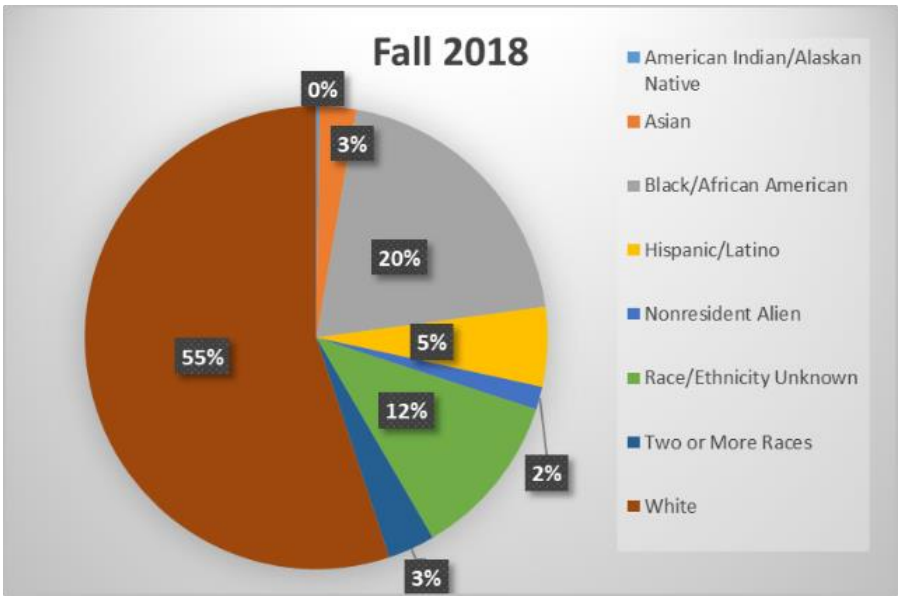
EXECUTIVE SUMMARY
CURRENT AND HISTORICAL STUDENT ENROLLMENT
FUTURE ENROLLMENT
AVERAGE CLASS SIZE
STAFFING

EXECUTIVE SUMMARY

In the fall of 2018, EMU enrolled another strong classes of freshmen which included 2,365 first-time freshmen. This year's incoming freshman class is well-prepared academically. The average GPA of incoming freshmen is 3.31, up from 3.08 in 2011. Since the State switched from using ACT to SAT last year, historical comparison of SAT score is still not available yet. The Fall 18 Cohort average SAT score is 1,085.



EMU's entering freshman class also shows a highly diversified mix at Eastern. Thirty-one percent (31%) of the incoming freshman class are from ethnic minority populations.



CURRENT AND HISTORICAL ENROLLMENT

In Fall 2018, among the total enrollments of 18,838 students, 12,072 (or 64.1%) registered for courses offered on-campus only, 2,170 are registered online only (11.5%), and 4,596 (24.4%) are registered in a combination of courses from on-campus and online.

Fall 2018 Enrollment (Start of the Term Census)

Level	Combination	On-Campus	Online	Grand Total
UG	4,088	10,179	1,463	15,730
GR	508	1,893	707	3,108
Grand Total	4,596	12,072	2,170	18,838

The University has continued to maintain strong enrollment from first-time freshman classes, but experienced overall enrollment decline for the past five years primarily due to the policy shift on Federal Pell grants, lower numbers of transfer and graduate students, overall decline of high school graduates in the State, and a strong economy (i.e., low unemployment rate). Additionally, EMU made a holistic effort to help students complete a degree faster. Despite of the enrollment decline, EMU has awarded a steady and record number of degrees in the past 5 years. Also, FTIAC 4-, 5-, and 6-year degree completion rates have increased significantly in recent years (see tables below).

Degrees Awarded by Academic Year

	AY2014	AY2015	AY2016	AY2017	AY2018
Total Count	4,850	4,635	4,727	4,742	4,678

Trends of FTIAC 4-, 5-, 6-Year Completion Rate (in %)

Cohort Start Term	Cohort Size	4-Year	5-Year	6-Year
Fall 2008	2,167	12.9	27.0	36.6
Fall 2009	2,196	13.1	30.9	40.1
Fall 2010	1,955	13.0	32.3	40.7
Fall 2011	2,119	14.1	31.7	40.4
Fall 2012	2,612	16.6	36.8	45.1
Fall 2013	2,848	19.1	38.9	
Fall 2014	2,588	19.9		

Fall Enrollment Trends (Headcount and Student Credit Hours by Level)

	Fall Headcount Enrollment		Fall Credit Hours	
Term	Undergraduate Students	Graduate Students	Undergraduate Credit Hours	Graduate Credit Hours
Fall 2014	18,340	4,090	218,636	23,279
Fall 2015	17,951	3,903	215,862	23,211
Fall 2016	17,541	3,564	212,374	22,477
Fall 2017	16,997	3,316	204,974	21,258
Fall 2018	15,730	3,108	189,093	20,455

FTIAC Enrollment Trends

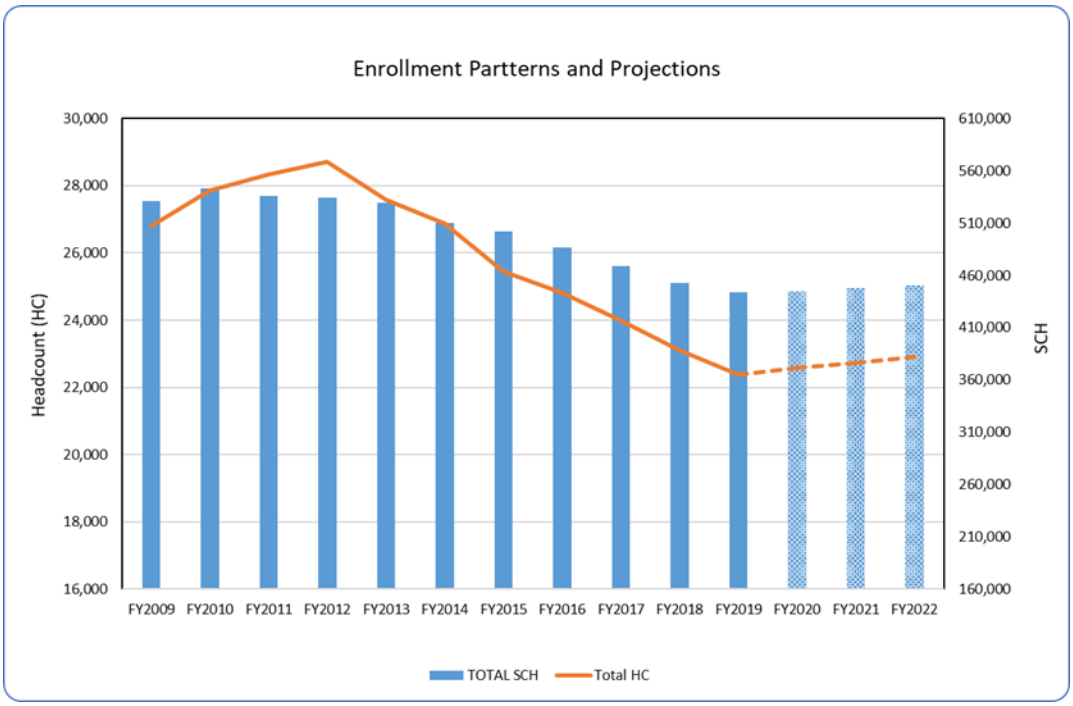
Term	New FTIAC
Fall 2014	2,588
Fall 2015	2,846
Fall 2016	2,785
Fall 2017	2,781
Fall 2018	2,365

ENROLLMENT PATTERNS

The University has continued to maintain strong enrollment from first-time freshman classes but experienced overall enrollment decline for the past four years primarily due to the policy shift on Federal Pell grant, and lower numbers of transfer and graduate students. With the implementation of multiple new enrollment strategies, including new program development and exploring new enrollment markets, we anticipate the enrollment trend will become stabilized for the upcoming few years and then see enrollment growth from Fall 2019.

Future Enrollment

With the implementation of multiple new enrollment strategies, including new program developments and exploring new enrollment markets, we anticipate the enrollment trend will become stabilized for the upcoming few years and then see enrollment growth from Fall 2020.



AVERAGE CLASS SIZE

The average class size is based on total course enrollment divided by the total number of course sections, excluding courses which are lecture-based or involve individual advising. Over the past five years the University has maintained a stable average class size rate, which is attributable to the University experiencing an overall steady number of FTIAC students in recent years offsetting other decreases in overall enrollment.

Fall Terms	Average Class Size
2018	20.0
2017	20.7
2016	21.1
2015	20.8
2014	20.9

INSTRUCTIONAL STAFF/STUDENT AND ADMINISTRATIVE STAFF/STUDENT RATIOS

Eastern Michigan University
Full-Time-Equated (FTE)
Faculty, Staff, and Students
Fall 2017 Official Record

FACULTY FTE			Total	Ratio
College Description	FT Headcount	PT FTE	Faculty FTE	Student FTE to Faculty FTE
College of Arts & Sciences	394	131.1	525.2	11.1
College of Business	86	15.3	101.3	21.9
College of Education	74	8.6	82.6	19.9
College of Health & Human Serv	130	54.4	184.4	18.9
College of Technology	64	12.6	76.6	23.6
Grand Total	748	222	970	16.4

Instructional Faculty FTE includes full-time faculty, full-time lecturers, instructional part-time lecturers, and Instructional graduate assistants. It does not include Library personnel.
Full-time Headcount equals 1 FTE
Part-time FTE equals the number of headcount divided by three.

STAFF FTE			Total	Ratio
College Description	FT Headcount	PT FTE	Staff FTE	Student FTE to Staff FTE
College of Arts & Sciences	76	190.9	266.9	21.9
College of Business	23	24.1	47.1	47.2
College of Education	30	19.0	49.0	33.6
College of Health & Human Serv	27	23	50	69.7
College of Technology	16	33.9	49.9	36.2
Grand Total	172	290.9	462.9	34.5

Instructional Staff FTE includes administrative, professional-technical, clerical, non-instructional Part-time Lecturers (Adjuncts), and non-instructional graduate assistants. It does not include Library personnel.
Full-time Headcount equals 1 FTE.
Part-time FTE equals the sum of the percent of appointments.

STUDENT FTE			Total
College Description	FT Headcount	PT FTE	Student FTE
College of Arts & Sciences	4,858	988.7	5,846.7
College of Business	1,691	530.1	2,221.1
College of Education	1,135	512.8	1,647.8
College of Health & Human Serv	2,573	912.9	3,485.9
College of Technology	1,412	392.4	1,804.4
Academic Affairs	690	254.9	944.9
Grand Total	12,359	3,591.8	15,950.8

FT Student Headcount equals 1 FTE
PT Student FTE equals the total number of credit hours divided by the number of hours for the semester
All undergraduate credit hours were divided by 12 and all graduate credit hours were divided by 9.

Eastern Michigan University makes great efforts to improve institutional effectiveness and operational efficiency. One of the four overarching themes in the EMU's new strategic plan is institutional effectiveness. Since the 15% state appropriation reduction in FY11/12 through FY16/17, the University's operating expenses have increased annually by only 1.03% and more recently from FY16/17 to FY17/18, its operating expenses have essentially been held flat (see table below). As part of this effort, EMU constantly assesses its staffing needs based on enrollment, and delivery method of education. It is expected that EMU will maintain a relatively stable number of staff and faculty members. Online courses and degree offerings will continue to grow, which may shift some priorities of staffing in support units.

Trends of EMU Total Operating Expenses

Fiscal Year	Total Operating Expenses (in '000's)
FY10/11	$332,686
FY11/12	$332,625
FY12/13	$331,187
FY13/14	$339,052
FY14/15	$344,310
FY15/16	$352,904
FY16/17	$353,300
FY17/18	$345,860

FACILITY ASSESSMENT

EXECUTIVE SUMMARY
BUILDING AND CLASSROOM UTILIZATION RATES
ARCHITECTUAL SYSTEMS
MECHANICAL SYSTEMS
ELECTRICAL SYSTEMS (BUILDINGS)
ELEVATOR SYSTEMS
FIRE PROTECTION SYSTEMS
ELECTRIC SUPPLY AND DISTRIBUTION SYSTEMS
SITE WORK AND DRAINAGE SYSTEMS
ENERGY PLAN GOALS
ROADS, PARKING LOTS AND STRUCTURES

EXECUTIVE SUMMARY

The Physical Plant department at Eastern Michigan University continues to develop and implement what is clearly stated in our motto: “providing an environment for education first”.

Our comprehensive approach to managing the facilities portfolio starts with conceptual campus planning reflective of our collegian mission. We recognize and embrace the benefits of efficiency, by constructing, augmenting and maintaining facilities that are functional, adaptable and energy efficient. This results in the implementation of construction and renovation projects that take into consideration all the operational aspects of building and facilities management for years to come.

Our administrative team understands the real constraints associated with available funding and recognizes the potential to financially neglect the facility’s needs to meet available budget funding. Consequently, we have collectively formulated a plan to prioritize and balance our facility’s needs with budget. This remains a prudent path to take, both financially and operationally.

The tendency to ignore or postpone the needs of the University’s physical assets as we go through these times of fiscal constraint is recognized by this same team. In support of our mission today, and for years to come, our team emphasizes and promotes the need to retain a realistic financial commitment to the relative long-term soundness and effectiveness of our facilities.

By establishing a detailed base line database that is reflective of our existing facilities conditions, we have completed the essential first step in developing a sound facilities management strategy. Our database is well organized, realistic, defendable, and is used as our foundation to plan, fund and execute realistic and meaningful facilities improvements for the benefit of our students, faculty and staff.

As a part of a continuous improvement process, all identification and documenting of existing conditions of University equipment and building components continues to be recorded within the Asset Preservation module of our Computerized Maintenance Management System. Hence, the establishment of our detailed base line database that is reflective of our existing facilities conditions.

It is important to emphasize that we have field verified this deferred maintenance calculation by undergoing a rigorous review of the existing facilities conditions. This auditing process continues to be ongoing and that any adjustments that were made within this Capital Outlay submission were based on actual conditions found.

This Capital Outlay submission, as with others in the past, is inclusive of projects of over $1M dollars in capital that is considered essential for the day to day operations of the University’s facilities. Mandated actions, required for code compliance, such as the testing of life safety

equipment, and in some cases chemical treatments that are required to operate and maintain essential equipment and building components, have been itemized and included within this report.

Lastly, as was mentioned in previous submissions, a significant reduction in deferred maintenance was accomplished with the $90 million self-funded Mark Jefferson Science Complex Project, the $15 million self-funded Rackham Hall Renovation Project and the State supported Pray-Harrold Building Renovation and Strong Hall Renovation. With the planned $40 million self-funded renovation of Sill Hall, we will continue this trend. These projects have made a significant dent into the University's deferred maintenance schedule. While we continue to work towards a reduction of deferred maintenance through smaller local capital efforts our goal now is to continue this significant reduction in deferred maintenance by modernizing and expanding Jones Hall. Jones Hall is included amongst the largest liabilities of deferred maintenance needs on campus.

BUILDING AND CLASSROOM UTILIZATION RATES

Identify building/classroom usage rates for peak (M-F, 10-3), and off-peak (M-F, 8-10am, 3-5pm), evening, and weekend periods.

During 2008 and 2009, a Space Utilization study was conducted regarding building and classroom utilization rates; that is, the percentage of rooms used and the percentage that are at capacity relative to academic facilities. Results of the study, based on student enrollment counts from the Fall 2007 semester are as follows:

	Average %	Range in %
Peak Hours (M to F, 10 am to 3 pm)	63%[1]	5% (F at 3) to 78% (T at 11)
Non Peak Mornings (M to F, 8 to 10 am)	36%	16% (F at 8) to 60% (T at 9:30)
Non-Peak Afternoon (M to F, 3 to 5 pm)	46%[2]	5% (F at 3) to 63% (T at 3)
Non-Peak Evenings (M to F, after 5 pm)	50%[3]	4% (F at 8) to 75% (T at 6:30)
Non-Peak Weekends (Sat. and Sun.)	3%	0% to 10% (St at 10)

Notes: [1] = Classes are primarily scheduled Monday through Thursday, which for the same time period has an average utilization rate of 71%. The Friday utilization is significantly lower due to fewer classes on these days.

[2] = Classes are primarily scheduled Monday through Thursday, which for the same time period has an average utilization rate of 57%. The Friday utilization is significantly lower due to fewer classes on these days.

[3] = Classes are primarily scheduled Monday through Thursday, which for the same time period has an average utilization rate of 61%. The Friday utilization is significantly lower due to fewer classes on these days.

In Fall 2009, the overall University average seat capacity in classrooms is 71%. The consultant preparing this study indicated that "when an institution reaches and exceeds the 80% level of classroom use, the more difficult it becomes to find available classrooms in the right geographical locations with the right classroom capacities."

Due to the construction activities of the two largest classroom buildings on campus during the time of this study (Pray-Harrold and Mark Jefferson), the Space Utilization rates are slightly skewed to heavier uses than normal conditions. Furthermore, a centralized room scheduling system has been implemented and the utilization rates classroom seat capacities is estimated over 80% for traditional classrooms. We anticipate a more naturalized utilization rate can be developed in future studies, and indeed preliminary data indicates this trend. Examples of increased and adjusted utilization rates include:

	Average % Occupancy for Fall 2011
Peak Hours (M to F, 10 am to 3 pm)	95% rooms scheduled for use
Non Peak Mornings (M to F, 8 to 10 am)	77% of rooms scheduled for use

General Fund Building
Age / Replacement Report
Table 1

Name	Primary Use	Floors	Sq./ft.	Date Built	Architectural	Mechanical	Electrical	2019 Building Replacement Value
Mark Jefferson***	academic	5	262,273	1969	2011	2011	2011	$ 127,779,514
Halle Library	academic	5	273,715	1998	1998	1998	1998	92,384,288
Pray Harrold***	academic	7	237,108	1967	2011	2011	2011	80,028,693
Owen C.O.B**	academic	5	126,000	1990	1990	1990	1990	51,434,173
John W. Porter	academic	3	143,775	1966	1999	1999	1999	48,526,938
Warner	academic	2	95,349	1964	1964	1964	1964	32,182,195
Sill Hall	academic	2	92,635	1965	1965	1965	1965	31,266,165
Alexander	academic	4	86,900	1980	1980	1998	1980	29,330,488
Strong	academic	3	80,713	1957	1957	1957	1957	27,242,252
Roosevelt	academic	2	75,639	1924	1973	1973	1973	25,529,675
Everett C. Marshall	academic	3	70,324	2000	2000	2000	2000	23,735,757
Quirk	academic	2	58,205	1959	1959	1959	1959	19,645,352
Rackham***	academic	2	45,890	1938	2015	2015	2015	15,488,793
Sherzer	academic	3	35,253	1903	1990	2011	1990	11,898,593
Ford Hall	academic	2	33,333	1929	1968	1968	1968	11,250,554
Kresge Center	academic	1	12,606	1974	1974	1974	1974	4,254,777
Paint Research**	academic	1	8,000	1987	1987	1987	1987	3,769,527
Parsons Center	academic	1	9,948	2007	2007	2007	2007	3,510,351
Briggs	academic	1	9,500	1937	1990	1990	1990	3,206,440
Greenhouse & Aquatic Biology	academic	1	5,200	1998	1998	1998	1998	1,755,104
Sculpture Studio***	academic	1	4,648	1959	2015	2015	2015	1,568,793
Honors College	academic	2	21,405	1965	2005	2005	2005	1,007,000
School House**	academic	1	900	1905	1988	1988	1988	846,506
Heating Plant**	non-academic	3	23,856	1951	1951	2017	2017	56,116,842
McKenny	non-academic	4	107,103	1931	1992	1992	1992	36,149,405
Goddard	non-academic	5	75,856	1955	1955	1955	1955	28,426,277
Jones	**non-academic**	**5**	**70,491**	**1948**	**1948**	**1948**	**1948**	**26,415,797**
King	non-academic	4	61,450	1939	1939	1939	1939	23,029,156
Pierce Hall	non-academic	4	61,275	1948	1990	1990	1990	20,681,538
Boone Hall	non-academic	3	45,210	1914	2000	2000	2000	15,259,279
Snow	non-academic	2	30,035	1959	1959	1959	1959	14,506,022
Welch Hall	non-academic	4	36,840	1896	1986	1986	1986	12,434,237
Pease	non-academic	2	30,181	1914	1994	1994	1994	10,186,691
Physical Plant	non-academic	1	25,300	1995	1995	1995	1995	8,539,256
Hover	non-academic	2	11,021	1941	2002	2002	2002	5,191,263
University House	non-academic	2	10,700	2003	2003	2003	2003	4,330,450
Central Stores	non-academic	1	10,140	1972	1972	1972	1972	3,422,453
Starkweather Hall	non-academic	2	8,706	1896	1996	1991	1991	2,938,449
Central Operations	non-academic	1	5,665	1969	2012	2012	2012	1,499,900
611 W. Cross Street	non-academic	2	4,050	1970	1970	1970	1970	1,366,956
emu House	non-academic	2	1,434	1925	2014	2014	2014	227,900
TOTAL			**2,408,632**					**$ 918,363,801**
						Average Cost/sq. ft. =		**$ 381**

Average Year Built	**1955**			
Average Building Age (Years)	**63**			
Average Year Built Weighted by Sq. Ft.	**1963**	**1992**	**1993**	**1992**
Average Age Weighted by Sq. Ft. (Years)	**55**	**26**	**25**	**26**
Average Architectural, Elect., Mech. (Years)	**26**			

** Indicates Unique Building Replacement Costs
***Recent Major Renovation/Addition

Note:
Replacement costs reflect the cost to replace a building with "like-kind" systems. They do not include system upgrades to deliver more sophisticated curriculum or the "soft costs" and staging/phasing costs.

Building Deficiencies Priorities by Category
Table 2

I. Urgent

1. If not accomplished, will jeopardize the continued usefulness of the facility and may result in serious and irrevocable loss or damage

II. Required

If not accomplished, may jeopardize the continued usefulness of the facility

General Fund Building Deficiencies Cost Summary for FY 2020 by Priority

	Urgent	Required	Total
Total Campus Deficiencies Including Sitework, Drains, & Utility Infrastructure	$210,009,140	$52,210,875	$262,220,015

Table 3

General Fund Building Deficiency Cost Summary for FY 2020 by System

	Architectural	Electrical	Elevators	Fire Protection	Mechanical	Site Work	Total
General Fund Buildings	$82,257,677	$39,476,194	$4,913,216	$32,802,152	$83,444,871	$19,325,905	$262,220,015

General Fund Building Deficiency Cost Summary by System
Table 4

Building	Primary Use	Architectural	Electrical	Elevators	Life Safety	Mechanical	Site Work	Grand Total
Warner	academic	$ 8,089,240	$ 3,619,900	$ 159,000	$ 2,069,000	$ 7,127,440	$ -	$ 21,064,580
Sill Hall	academic	6,234,920	1,886,800	386,900	2,591,700	5,300,000	224,720	16,625,040
Owen C.O.B.	academic	5,333,100	302,100	360,000	1,118,300	5,835,300	797,120	13,745,920
Alexander	academic	7,340,240	722,920	296,800	86,920	2,247,730	-	10,694,610
Roosevelt	academic	4,248,060	850,000	37,100	1,091,800	3,270,300	174,900	9,672,160
Quirk	academic	1,925,780	852,800	86,920	556,500	1,787,700	-	5,209,700
Ford Hall	academic	1,271,740	1,199,920	-	530,000	1,802,000	-	4,803,660
John W. Porter	academic	553,000	174,900	82,680	58,300	2,067,000	-	2,935,880
Sherzer	academic	2,070,800	233,200	175,000	389,020	-	-	2,868,020
Halle Library	academic	1,707,500	286,200	125,000	129,320	349,800	-	2,597,820
Kresge Center	academic	629,000	245,920	-	147,340	133,300	75,000	1,230,560
Briggs	academic	620,300	95,400	-	230,020	268,180	-	1,213,900
Paint Research	academic	353,780	53,000	-	56,180	609,500	-	1,072,460
Everett C. Marshall	academic	514,100	90,100	291,500	58,300	-	-	954,000
Pray Harrold	academic	224,900	53,000	598,900	-	57,240	-	934,040
Mark Jefferson	academic	85,860	163,240	550,000	58,300	75,000	-	932,400
Greenhouse & Aquatic Biology	academic	207,320	66,780	-	82,680	509,000	-	865,780
Parsons Center	academic	720,000	50,000	-	-	-	-	770,000
Honors College	academic	210,500	65,000	-	159,000	106,000	-	540,500
School House	academic	72,080	-	-	55,120	-	-	127,200
Rackham	academic	30,000	-	-	-	-	-	30,000
Strong	academic	-	-	-	-	-	-	-
Sculpture Studio	academic	-	-	-	-	-	-	-
Campus	non-academic	6,619,700	10,942,500	-	5,988,300	10,785,500	14,670,400	49,006,400
Goddard	non-academic	7,398,800	4,404,300	272,420	3,466,200	8,301,920	901,000	24,744,640
Jones	**non-academic**	**6,420,897**	**4,026,834**	**347,256**	**3,365,712**	**7,943,481**	**1,029,525**	**23,133,705**
McKenny	non-academic	820,100	1,740,000	318,000	2,501,600	7,362,180	-	12,741,880
King	non-academic	3,013,500	1,600,000	298,920	1,839,100	3,628,500	-	10,380,020
Welch Hall	non-academic	3,585,540	657,200	86,920	1,878,320	2,089,800	150,000	8,447,780
Snow	non-academic	3,404,900	212,000	-	911,600	3,710,000	53,000	8,291,500
Heating Plant	non-academic	1,511,220	500,000	-	784,400	3,301,900	-	6,097,520
Pierce Hall	non-academic	1,004,100	1,346,200	174,900	982,620	1,499,900	253,000	5,260,720
Pease	non-academic	1,899,700	1,359,000	185,500	457,920	654,020	-	4,556,140
Starkweather Hall	non-academic	2,079,900	410,220	-	359,340	1,611,200	-	4,460,660
University House	non-academic	956,120	856,000	-	-	198,220	971,240	2,981,580
Physical Plant	non-academic	140,000	120,840	-	44,520	458,980	-	764,340
Boone Hall	non-academic	225,000	-	-	360,400	-	-	585,400
Central Operations	non-academic	103,000	203,000	-	-	212,000	-	518,000
611 W. Cross Street	non-academic	241,680	60,420	-	145,220	28,620	-	475,940
Hover	non-academic	83,300	-	79,500	174,900	113,160	-	450,860
Central Stores	non-academic	278,000	-	-	58,300	-	-	336,300
emu House	non-academic	30,000	26,500	-	15,900	-	26,000	98,400
Total Building Deficiencies		$ 82,257,677	$ 39,476,194	$ 4,913,216	$ 32,802,152	$ 83,444,871	$ 19,325,905	$ 262,220,015

General Fund Building Deficiency Cost Summary by Priority
Table 5

Building	Primary Use	Urgent	Required	Grand Total
Warner	academic	$ 14,807,540	$ 6,257,040	$ 21,064,580
Sill Hall	academic	14,898,300	1,726,740	16,625,040
Owen C.O.B.	academic	13,610,920	135,000	13,745,920
Alexander	academic	8,097,080	2,597,530	10,694,610
Roosevelt	academic	6,298,560	3,373,600	9,672,160
Quirk	academic	2,062,020	3,147,680	5,209,700
Ford Hall	academic	3,553,920	1,249,740	4,803,660
John W. Porter	academic	308,300	2,627,580	2,935,880
Sherzer	academic	2,868,020	-	2,868,020
Halle Library	academic	453,520	2,144,300	2,597,820
Kresge Center	academic	722,220	508,340	1,230,560
Briggs	academic	792,000	421,900	1,213,900
Paint Research	academic	966,460	106,000	1,072,460
Everett C. Marshall	academic	858,600	95,400	954,000
Pray Harrold	academic	232,140	701,900	934,040
Mark Jefferson	academic	625,000	307,400	932,400
Greenhouse & Aquatic Biology	academic	661,200	204,580	865,780
Parsons Center	academic	500,000	270,000	770,000
Honors College	academic	224,000	316,500	540,500
School House	academic	55,120	72,080	127,200
Rackham	academic	30,000	-	30,000
Strong	academic	-	-	-
Sculpture Studio	academic	-	-	-
Campus	non-academic	45,720,400	3,286,000	49,006,400
Goddard	non-academic	23,843,640	901,000	24,744,640
Jones	**non-academic**	**22,104,180**	**1,029,525**	**23,133,705**
McKenny	non-academic	10,773,980	1,967,900	12,741,880
King	non-academic	8,668,600	1,711,420	10,380,020
Welch Hall	non-academic	3,263,840	5,183,940	8,447,780
Snow	non-academic	7,390,500	901,000	8,291,500
Heating Plant	non-academic	2,078,000	4,019,520	6,097,520
Pierce Hall	non-academic	2,818,820	2,441,900	5,260,720
Pease	non-academic	3,716,620	839,520	4,556,140
Starkweather Hall	non-academic	2,950,160	1,510,500	4,460,660
University House	non-academic	2,110,260	871,320	2,981,580
Physical Plant	non-academic	483,980	280,360	764,340
Boone Hall	non-academic	225,000	360,400	585,400
Central Operations	non-academic	209,000	309,000	518,000
611 W. Cross Street	non-academic	475,940	-	475,940
Hover	non-academic	174,900	275,960	450,860
Central Stores	non-academic	278,000	58,300	336,300
emu House	non-academic	98,400	-	98,400
Total Campus Deficiencies		$ 210,009,140	$ 52,210,875	$ 262,220,015

Total System Deficiencies by Building Age

Table 6

Building Name		Primary Use	Building Sq. Ft.	Date Built/ Number	2019 Building Replacement Value	Anticipated 2019 Backlog Deficiency	Facility Condition Index
Before 1900							
Starkweather Hall		non-academic	8,706	1896	$ 2,938,449	$ 4,460,660	1.52
Welch Hall		non-academic	36,840	1896	12,434,237	8,447,780	0.68
	Total		45,546		$ 15,372,686	$ 12,908,440	
1900-1949							
Ford Hall		academic	33,333	1929	$ 11,250,554	$ 4,803,660	0.43
Roosevelt		academic	75,639	1924	25,529,675	9,672,160	0.38
Briggs		academic	9,500	1937	3,206,440	1,213,900	0.38
Sherzer		academic	35,253	1903	11,898,593	2,868,020	0.24
School House		academic	900	1905	846,506	127,200	0.15
Rackham		academic	45,890	1938	15,488,793	30,000	0.00
Jones		**non-academic**	**70,491**	**1948**	**26,415,797**	**23,133,705**	**0.88**
King		non-academic	61,450	1939	23,029,156	10,380,020	0.45
Pease		non-academic	30,181	1914	10,186,691	4,556,140	0.45
emu House		non-academic	1,434	1925	227,900	98,400	0.43
McKenny		non-academic	107,103	1931	36,149,405	12,741,880	0.35
Pierce Hall		non-academic	61,275	1948	20,681,538	5,260,720	0.25
Hover		non-academic	11,021	1941	5,191,263	450,860	0.09
Boone Hall		non-academic	45,210	1914	15,259,279	585,400	0.04
	Total		588,680		$ 205,361,591	$ 75,922,065	
1950-1969							
Warner		academic	95,349	1964	32,182,195	21,064,580	0.65
Honors college		academic	21,405	1965	1,007,000	540,500	0.54
Sill Hall		academic	92,635	1965	31,266,165	16,625,040	0.53
Quirk		academic	58,205	1959	19,645,352	5,209,700	0.27
John W. Porter		academic	143,775	1966	48,526,938	2,935,880	0.06
Pray Harrold		academic	237,108	1967	80,028,693	934,040	0.01
Mark Jefferson		academic	262,273	1969	127,779,514	932,400	0.01
Strong		academic	80,713	1957	$ 27,242,252	$ -	-
Sculpture Studio		academic	4,648	1959	1,568,793	-	-
Goddard		non-academic	75,856	1955	28,426,277	24,744,640	0.87
Snow		non-academic	30,035	1959	14,506,022	8,291,500	0.57
Central Operations		non-academic	5,665	1969	1,499,900	518,000	0.35
Heating Plant		non-academic	23,856	1951	56,116,842	6,097,520	0.11
	Total		1,131,523		$ 469,795,944	$ 87,893,800	
1970-1979							
Kresge Center		academic	12,606	1974	$ 4,254,777	$ 1,230,560	0.29
611 W. Cross Street		non-academic	4,050	1970	1,366,956	475,940	0.35
Central Stores		non-academic	10,140	1972	3,422,453	336,300	0.10
	Total		26,796		$ 9,044,186	$ 2,042,800	
1980-1989							
Alexander		academic	86,900	1980	$ 29,330,488	$ 10,694,610	0.36
Paint Research		academic	8,000	1987	3,769,527	1,072,460	0.28
	Total		94,900		$ 33,100,015	$ 11,767,070	
1990-1999							
Greenhouse & Aquatic Biology		academic	5,200	1998	$ 1,755,104	$ 865,780	0.49
Owen C.O.B.		academic	126,000	1990	51,434,173	13,745,920	0.27
Halle Library		academic	273,715	1998	92,384,288	2,597,820	0.03
Physical Plant		non-academic	25,300	1995	8,539,256	764,340	0.09
	Total		430,215		$ 154,112,821	$ 17,973,860	
Post 2000							
Parsons Center		academic	9,948	2007	$ 3,510,351	$ 770,000	0.22
Everett C. Marshall		academic	70,324	2000	$ 23,735,757	$ 954,000	0.04
University House		non-academic	10,700	2003	4,330,450	2,981,580	0.69
	Total		90,972		$ 31,576,558	$ 4,705,580	
Sitework, Drains, & Infrastructure							
Campus		non-academic	n/a	n/a	n/a	$ 49,006,400	#N/A
	Total		n/a		n/a	$ 49,006,400	
Total Building Deficiencies			2,408,632		$ 918,363,801	$ 262,220,015	

Building System Deficiencies by Age

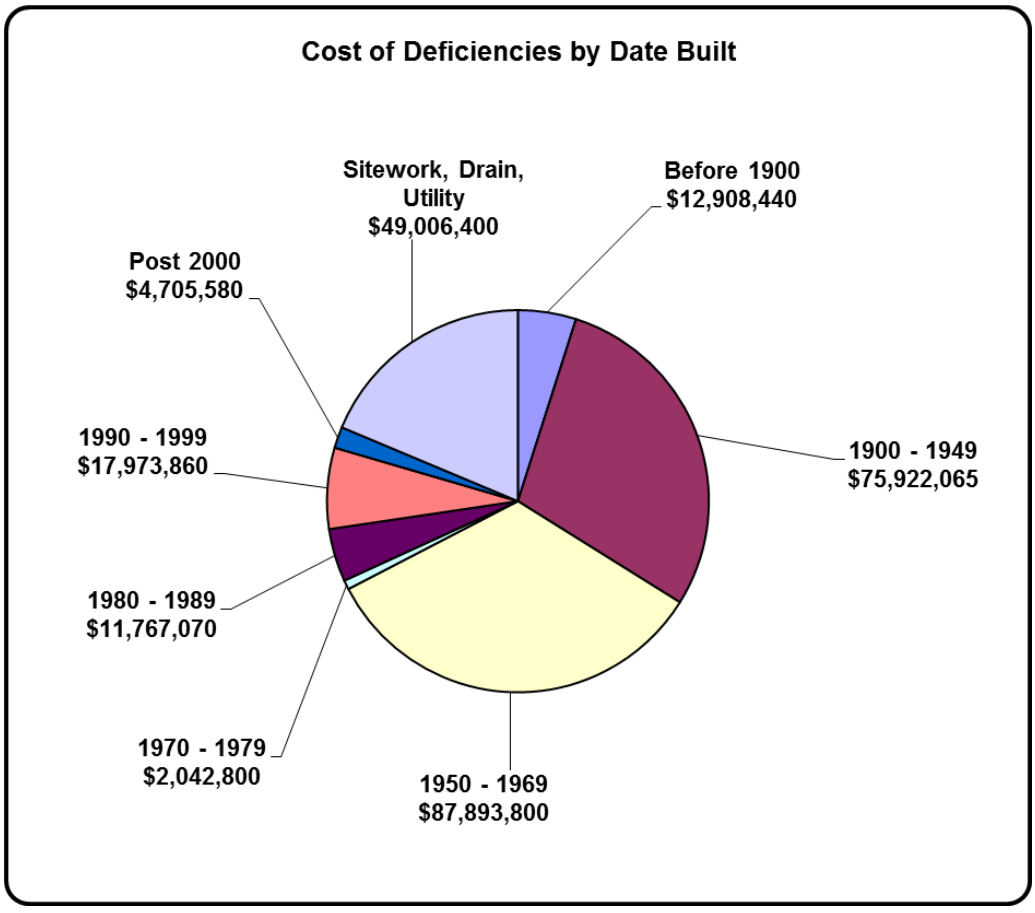
Table 7

General Fund Building Profile Data

Total number of General Fund Facilities	41
Current Replacement Value	$ 918,363,801
Total Gross Sq. ft.	2,408,632
Total Cost of General Fund Building Deficiencies (to date)	$ 262,220,015

General Fund Building Age Summary

Date Built	No. of Facilities	Gross Sq. Ft.	Cost of Deficiencies
Before 1900	2	45,546	12,908,440
1900 - 1949	14	588,680	75,922,065
1950 - 1969	13	1,131,523	87,893,800
1970 - 1979	3	26,796	2,042,800
1980 - 1989	2	94,900	11,767,070
1990 - 1999	4	430,215	17,973,860
Post 2000	3	90,972	4,705,580
Sitework, Drain, Utility	0	n/a	49,006,400



General Fund Facility Condition Index

Table 8

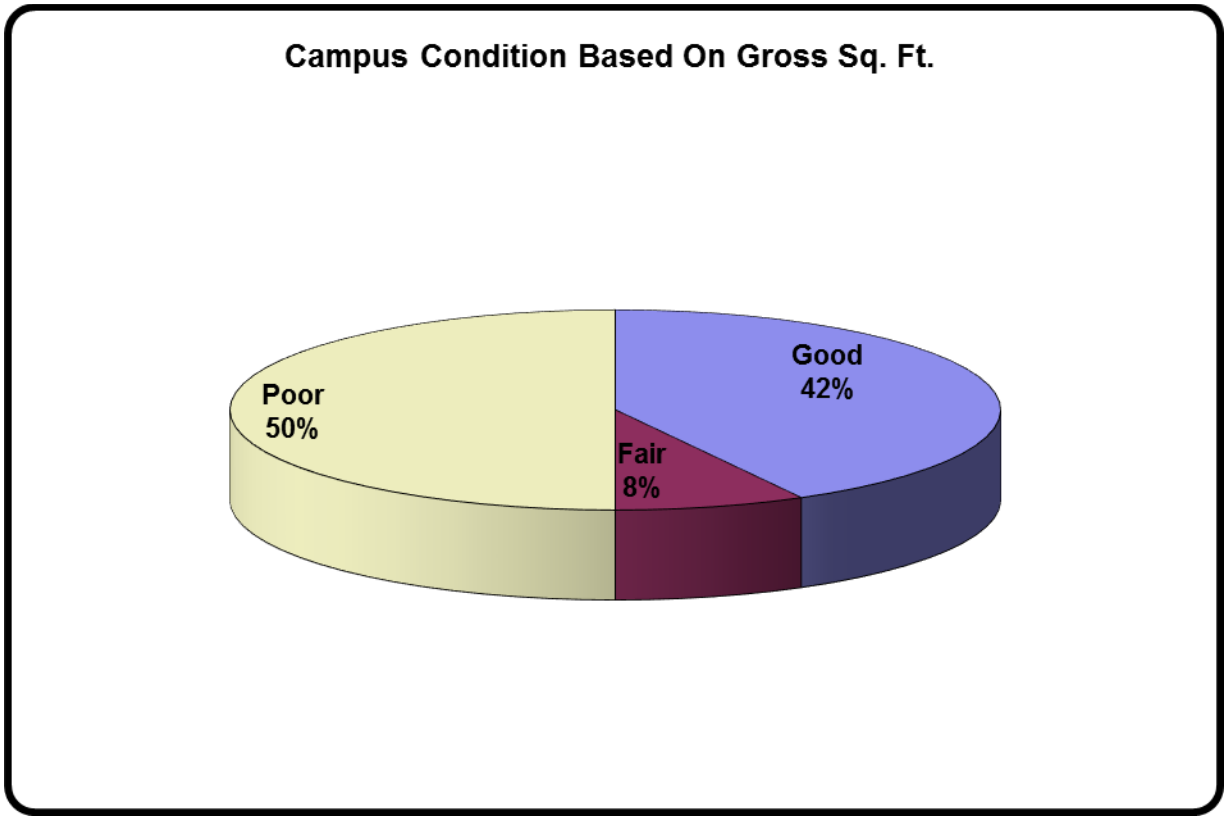
General Fund Facility Condition Index

Facility Condition Index =	Backlog Deficiency / Current Replacement Value	=	$262,220,015 / $918,363,801

Facility Condition Index (All Facilities) = 0.29

General Fund Facility Condition Index Summary

	Facility Condition Index		
	Good (Under .05)	Fair (.05 - .10)	Poor (Over .10)
Number of Facilities	8	4	29
Gross Square ft.	1,019,881	190,236	1,198,515
Percentage of Campus Gross Sq. ft.	42%	8%	50%



Facility Condition Index (FCI) by Building
Table 9

Building Name	Primary Use	Building Sq. Ft.	Year Built	2019 Building Replacement Value	Building Deficiencies (All Systems)	Facility Condition Index
Poor (Over .10)						
Warner	academic	95,349	1964	$ 32,182,195	$ 21,064,580	0.6545
Honors College	academic	21,405	1965	1,007,000	540,500	0.5367
Sill Hall	academic	92,635	1965	31,266,165	16,625,040	0.5317
Greenhouse & Aquatic Biology	academic	5,200	1998	1,755,104	865,780	0.4933
Ford Hall	academic	33,333	1929	11,250,554	4,803,660	0.4270
Roosevelt	academic	75,639	1924	25,529,675	9,672,160	0.3789
Briggs	academic	9,500	1937	3,206,440	1,213,900	0.3786
Alexander	academic	86,900	1980	29,330,488	10,694,610	0.3646
Kresge Center	academic	12,606	1974	4,254,777	1,230,560	0.2892
Paint Research	academic	8,000	1987	3,769,527	1,072,460	0.2845
Owen C.O.B.	academic	126,000	1990	51,434,173	13,745,920	0.2673
Quirk	academic	58,205	1959	19,645,352	5,209,700	0.2652
Sherzer	academic	35,253	1903	11,898,593	2,868,020	0.2410
Parsons Center	academic	9,948	2007	3,510,351	770,000	0.2194
School House	academic	900	1905	846,506	127,200	0.1503
Starkweather Hall	non-academic	8,706	1896	2,938,449	4,460,660	1.5180
Jones	**non-academic**	**70,491**	**1948**	**26,415,797**	**23,133,705**	**0.8758**
Goddard	non-academic	75,856	1955	28,426,277	24,744,640	0.8705
University House	non-academic	10,700	2003	4,330,450	2,981,580	0.6885
Welch Hall	non-academic	36,840	1896	12,434,237	8,447,780	0.6794
Snow	non-academic	30,035	1959	14,506,022	8,291,500	0.5716
King	non-academic	61,450	1939	23,029,156	10,380,020	0.4507
Pease	non-academic	30,181	1914	10,186,691	4,556,140	0.4473
emu House	non-academic	1,434	1925	227,900	98,400	0.4318
McKenny	non-academic	107,103	1931	36,149,405	12,741,880	0.3525
611 W. Cross Street	non-academic	4,050	1970	1,366,956	475,940	0.3482
Central Operations	non-academic	5,665	1969	1,499,900	518,000	0.3454
Pierce Hall	non-academic	61,275	1948	20,681,538	5,260,720	0.2544
Heating Plant	non-academic	23,856	1951	$ 56,116,842	$ 6,097,520	0.1087
Total		1,198,515		$ 469,196,523	$ 202,692,575	
Fair (.05 -.10)						
John W. Porter	academic	143,775	1966	$ 48,526,938	$ 2,935,880	0.0605
Central Stores	non-academic	10,140	1972	3,422,453	336,300	0.0983
Physical Plant	non-academic	25,300	1995	8,539,256	764,340	0.0895
Hover	non-academic	11,021	1941	5,191,263	450,860	0.0868
Total		190,236		$ 65,679,910	$ 4,487,380	
Good (Under .05)						
Everett C. Marshall	academic	70,324	2000	23,735,757	954,000	0.0402
Halle Library	academic	273,715	1998	92,384,288	2,597,820	0.0281
Pray Harrold	academic	237,108	1967	80,028,693	934,040	0.0117
Mark Jefferson	academic	262,273	1969	127,779,514	932,400	0.0073
Rackham	academic	45,890	1938	15,488,793	30,000	0.0019
Sculpture Studio	academic	4,648	1959	1,568,793	-	0.0000
Strong	academic	80,713	1957	27,242,252	-	0.0000
Boone Hall	non-academic	45,210	1914	15,259,279	585,400	0.0384
Total		1,019,881		$ 383,487,368	$ 6,033,660	
Sitework, Drains, Utilities I/F						
Campus	non-academic	n/a	n/a	n/a	$ 49,006,400	#N/A
Total		n/a		n/a	$ 49,006,400	
Total Building Deficiencies		2,408,632		918,363,801	262,220,015	0.2855

ARCHITECTURAL SYSTEMS

Overview

Architectural systems are primary building systems and components such as foundations, substructure, superstructure and building envelope. Secondary "exterior" systems include roofing, siding, glass, glazing, windows, exterior doors, flashings, painting and caulking. Secondary "interior" systems include interior partitions, doors, walls, wall finishes, floors, floor finishes, ceilings and ceiling finishes. Maintaining integrity in the primary systems is fundamental to long-term preservation of a building. Architectural systems not only protect the more sensitive mechanical and electrical systems but also reflect on the image of the owner and the quality of the activities and programs performed within the building.

System Condition and Adequacy

The average age of the general fund buildings architectural systems is 28 years. The oldest systems date back to 1896 and include Starkweather and Welch Halls. Both buildings, however, have been restored several times since their construction. Most campus buildings more than 20 years old have had major roofing repairs and/or new roofing at least once. All, but the newest buildings have some building envelope deficiencies. Repairs that have been made to deficiencies in buildings renovated or newly constructed since 1990 have been limited primarily to interior walls, doors, floors and finishes.

Since 2006, the University has spent over $52 million preserving and renewing the architectural assets of campus facilities. EMU's future investments in the architectural systems of campus buildings are detailed in the 2020-2024 Asset Preservation listing within the Implementation Plan later in this document.

Improvements Completed

Recent Architectural System improvements on campus include, but are not limited to the following:

Roosevelt Re-Roof	Completed May 2010
Ford Re-Roof	Completed May 2010
Starkweather Foundation Repairs	Completed June 2010
Welch Foundation Repairs	Completed July 2010
Halle Library Foundation Repairs	Completed August 2010
McKenny Union Foundation Repairs	Completed September 2010
Pray-Harrold Re-Roof	Completed August 2011
Pray-Harrold Windows	Completed August 2011
Mark Jefferson Windows	Completed August 2012
Mark Jefferson Re-Roof	Completed August 2012
Rackham Windows	Completed August 2012
Rackham Re-Roof	Completed August 2013

Sherzer Re-Roof and dormer siding	Completed August 2013
Alexander Re-Roof	Completed August 2013
Sill Hall partial Re-Roof	Completed August 2013
Rackham Hall Upper Level Renovations	Completed May 2014
Snow Health Center foundation repairs	Completed July 2014
Rynearson Stadium concrete repairs	Completed August 2014
Rackham Hall Lower Level and Façade	Completed August 2015
Sculpture Studio Renovation	Completed August 2015
Rynearson Stadium concrete repairs	Completed August 2015
Wise Hall Renovation Phases I-III	Completed August 2016
Fletcher ACC Program Enhancements	Completed November 2016
Wise Hall Renovation Phase IV	Completed August 2017
Quirk Lobby Renovations	Completed August 2017
Roosevelt Auditorium Renovation	Completed August 2017
Briggs Hall Re-Roof	Completed July 2018
Rynearson Stadium concrete repairs	Completed August 2018
Electrical Loop 1 Replacement	Completed August 2018
Quirk Foundations and Drainage	Completed August 2018
Elevator Controls Replacement	Completed September 2018
Pierce Hall Bell Tower Repairs	Completed October 2018

The University has completed a number of ADA Improvements as follows:

Ford ADA Ramp	Completed August 2010
Pray-Harrold Chair Lifts	Completed October 2011
Porter Bathroom Renovation	Completed November 2011
Oestrike Stadium ADA Accessibility	Completed July 2013
Bowman-Roosevelt Lot ADA Renovations	Completed July 2014
CD-1 Restrooms	Completed April 2015
Rynearson Stadium Home Restrooms	Completed August 2015
Ford Parking Lot Pedestrian Walkways	Completed August 2016
Green Lot II Pedestrian Walkways	Completed August 2016
East Circle Drive and Sidewalks	Completed August 2017
Green Lot I Parking and Pedestrian Walkways	Completed October 2018
Power Assist Doors Various Buildings	Continuous and Ongoing
Sidewalk and ADA curb cut repairs	Continuous and Ongoing

Architectural System Deficiencies by Building
Table 10

Building Name	Primary Use	Building Sq. Ft.	Year Built	2019 Building Replacement Value	Architectural System Deficiencies
Welch Hall	non-academic	36,840	1896	$ 12,434,237	$ 3,585,540
Starkweather Hall	non-academic	8,706	1896	2,938,449	2,079,900
Total Before 1900		45,546		$ 15,372,686	$ 5,665,440
Roosevelt	academic	75,639	1924	$ 25,529,675	$ 4,248,060
Sherzer	academic	35,253	1903	11,898,593	2,070,800
Ford Hall	academic	33,333	1929	11,250,554	1,271,740
Briggs	academic	9,500	1937	3,206,440	620,300
School House	academic	900	1905	846,506	72,080
Rackham	academic	45,890	1938	15,488,793	30,000
Jones	**non-academic**	**70,491**	**1948**	**26,415,797**	**6,420,897**
King	non-academic	61,450	1939	23,029,156	3,013,500
Pease	non-academic	30,181	1914	10,186,691	1,899,700
Pierce Hall	non-academic	61,275	1948	20,681,538	1,004,100
Mckenny	non-academic	107,103	1931	36,149,405	820,100
Boone Hall	non-academic	45,210	1914	15,259,279	225,000
Hover	non-academic	11,021	1941	5,191,263	83,300
emu House	non-academic	1,434	1925	227,900	30,000
Total 1900-1949		588,680		$ 205,361,591	$ 21,809,577
Warner	academic	95,349	1964	$ 32,182,195	$ 8,089,240
Sill Hall	academic	92,635	1965	31,266,165	6,234,920
Quirk	academic	58,205	1959	19,645,352	1,925,780
John W. Porter	academic	143,775	1966	48,526,938	553,000
Pray Harrold	academic	237,108	1967	80,028,693	224,900
Honors College	academic	21,405	1965	1,007,000	210,500
Mark Jefferson	academic	262,273	1969	127,779,514	85,860
Strong	academic	80,713	1957	27,242,252	-
Sculpture Studio	academic	4,648	1959	1,568,793	-
Goddard	non-academic	75,856	1955	28,426,277	7,398,800
Snow	non-academic	30,035	1959	14,506,022	3,404,900
Heating Plant	non-academic	23,856	1951	56,116,842	1,511,220
Central Operations	non-academic	5,665	1969	1,499,900	103,000
Total 1950-1969		1,131,523		$ 469,795,944	$ 29,742,120
Kresge Center	academic	12,606	1974	$ 4,254,777	$ 629,000
Central Stores	non-academic	10,140	1972	3,422,453	278,000
611 W. Cross Street	non-academic	4,050	1970	1,366,956	241,680
Total 1970-1979		26,796		$ 9,044,186	$ 1,148,680
Alexander	academic	86,900	1980	$ 29,330,488	$ 7,340,240
Paint Research	academic	8,000	1987	3,769,527	353,780
Total 1980-1989		94,900		$ 33,100,015	$ 7,694,020
Owen C.O.B.	academic	126,000	1990	$ 51,434,173	$ 5,333,100
Halle Library	academic	273,715	1998	92,384,288	1,707,500
Greenhouse & Aquatic Biology	academic	5,200	1998	1,755,104	207,320
Physical Plant	non-academic	25,300	1995	8,539,256	140,000
Total 1990-1999		430,215		$ 154,112,821	$ 7,387,920
Parsons Center	academic	9,948	2007	$ 3,510,351	$ 720,000
Everett C. Marshall	academic	70,324	2000	$ 23,735,757	$ 514,100
University House	non-academic	10,700	2003	4,330,450	956,120
Total Post 2000		90,972		$ 31,576,558	$ 2,190,220
Sitework, Drains, & Infrastructure					
Campus	non-academic	n/a	n/a	n/a	$ 6,619,700
ework, Drains & Infrastructure		n/a		n/a	$ 6,619,700
Total Building Deficiencies		2,408,632		$ 918,363,801	$ 82,257,677

MECHANICAL SYSTEMS

Overview

Mechanical systems and sub-systems are vital, diverse and complex building systems. Preventative and predictive maintenance programs have been developed and implemented to preserve these critical systems and provide a quality learning environment. Failure in any one of the multiple sub-systems can create reactive deficiencies in other sub-systems and seriously detract from the quality of the learning environment and lead to premature depletion of a building.

Mechanical sub-systems include:

Heating, Ventilation, Air Conditioning and Refrigeration (HVACR)
Storm and Sanitary Drain Systems
Chilled Water Systems
Domestic Water Supply Systems

Heating Ventilating and Air Conditioning Sub-System

Overview

Heating Ventilation and Air Conditioning (HVAC) systems encompass a broad, complex, intertwined array of equipment and components including exhaust fans, laboratory fume hoods, air handling units, steam absorbers, electric chillers, rooftop units, base board heat, heating coils, cooling coils, heat exchangers, duct work, fire dampers, direct expansion chillers, radiant ceiling panels, pneumatic controls, electro-mechanical controls, direct digital controls, programmable controllers, thermostats, transducers, and others too numerous to mention. The HVAC systems operate in concert with the building envelope, interior floor plan, and the space utilization program to maintain a comfortable environment for the end user (students, faculty, and staff) of the various areas of the building. Alterations or failures of any one of these systems and/or components can adversely impact occupant comfort and potentially shorten the useful life of the building.

System Condition and Adequacy

A partial deferred maintenance list showing major components of HVAC systems for the state buildings on campus has been compiled. Based on useful service life expectancy, the total deferred maintenance cost for the HVAC systems for these buildings is over $65 million. Normal life expectancy of various HVAC system components ranges from 10 to 30 years. Currently there are four (4) buildings that have been renovated or newly constructed within the last 10 years that have HVAC systems in good working condition. Some components of these systems are approaching the end of their useful life and will begin to require maintenance, repair, upgrades, or replacement to maintain system functionality. All of these systems must have ongoing preventative maintenance programs to avoid costly repairs, premature deterioration and untimely system failure.

The remaining buildings have equipment which has exceeded or is nearing the end of its useful life. These buildings are being kept in service through extraordinary efforts, but are beginning to compromise the quality of the learning environment. EMU's future investments in the mechanical systems of campus buildings are detailed in the 2020-2024 Asset Preservation Listing within the Implementation Plan later in this document.

Storm Drain Sub-Systems

Overview

The University storm drain system consists of 15,500 feet of storm sewer that drains rain water from 480 acres. This system catches all the surface water from roofs, parking lots, and streets on campus. The campus storm system is tied at various points to the City and County systems that eventually drain into the Huron River. City and County systems include a 24-inch main running down Cross Street, which borders the main campus to the south and the 66-inch Owen Drain that runs through the center of campus and collects water from, and intersects with, the 24-inch main, as well as other lines on the northern perimeter.

System Condition and Adequacy

In recent years the University has been experiencing storm water backup into some of its buildings during heavy rains. Initial observations indicate that some building roof drains and perimeter footing drains are backing up because the main lines into which they drain are at capacity. The University is concerned that the storm drainage system has reached or exceeded the design capacity; and that the City and County lines have also become overloaded and exceed their design capacity. Consequently, water pressure builds and forces drains to discharge water rather than accept it and carry it away.

The following engineering studies have been performed on selected portions of campus:

Map the existing system to include GPS location of manholes
Review the capacity of the existing storm system
Determine the elevations of the inverts and building basements
Calculate the required system capacity
Compare inlet and outlet capacities at each manhole

Dialogue continues regarding a plan of action and the associated costs for the recommendations of these studies.

Chilled Water Sub-Systems

Overview

The University Chilled Water system is a major component of the HVAC system and is used to provide air conditioning for a large portion of campus. The system is composed of six (6) main loops utilizing six (6) steam absorption units totaling 2,973 tons and ten (10) electric chillers totaling 4,429 tons. Buildings are connected to the loops via chilled water supply and return piping running through the steam tunnels or buried underground. Most University pumping systems include a backup condenser water pump and a backup chilled water pump. Cooling is typically needed from mid-April through the end of October. Halle Library and Mark Jefferson require year-round cooling.

Chilled Water System maintenance requires chiller tube bundles be serviced each winter to keep heat transfer surfaces clean; cooling tower water and chilled water require a constant, active water treatment program to control biological growth and prevent scaling and corrosion; steam absorbers require overhauls at three year intervals to maintain proper operation; and testing is performed every five years on both electric and absorption units to verify the integrity of the internal tubes.

System Condition and Adequacy

The campus chilled water loop system lacks redundancy. Many of the components are approaching the end of their useful lives creating the potential for disruption of service. In particular, cooling towers are requiring more costly repairs due to their age and conditions. Because the components are so inter-dependent, any single equipment failure could take a loop out of service causing the loss of one or more buildings.

Loop 1 is the Pierce Loop and serves eight (8) buildings. Loop 1 cooling includes three (3), 250-ton steam absorption units with three cooling towers and a 250-ton air-cooled electric chiller located at Pierce Hall. All units appear to be in good condition. The distribution piping for Loop 1 has experienced several failures and will require repair to other sections which are in poor condition.

Loop 2 is the Mark Jefferson Loop. It consists of one (1) 781-ton steam absorber and one (1) 1,000-ton electric chiller both located at Mark Jefferson and one (1) 852-ton steam absorber located at Halle Library. The 300 ton electric chiller at McKenny is no longer functional due to system age and obsolescence. This loop serves seven (7) buildings. A large portion of this system was refurbished as part of the Mark Jefferson Project; however, significant portions of the distribution piping remain in poor condition. Additional load was added to this loop as part of the Rackham renovation in 2012 and more recently the Strong Hall renovation.

Loop 3 serves eight (8) buildings. Chillers included in this loop are located in Pray-Harrold, Alexander, and Porter College of Education Building. Porter C.O.E. has one (1), 590-ton steam absorber in poor condition and one (1), 600-ton electric chiller in good condition. Pray Harrold

has one (1), 500-ton electric chiller which was installed as part of the building renovation. Alexander has one (1), 255-ton electric chiller which is in good condition. The absorber at Porter C.O.E. has exceeded its useful life and is in poor condition. The cooling towers for the units at Porter C.O.E. and Alexander are in poor condition.

Loop 4 is the College of Business Loop and serves one building. The Original 320-ton chiller which was in poor condition and utilized R-11 refrigerant has been replaced with a new chiller using a more environmentally friendly refrigerant. The old cooling tower which was also in poor condition has been replaced.

Loop 5 is the Convocation Center Loop and serves one building. It contains two (2), 380-ton electric chillers which are in good condition.

Loop 6 is the Student Center Loop. It contains two (2), 372- ton centrifugal chillers utilizing R 134-a. These units are in good condition.

Chilled Water Loop
Equipment Data Sheet
Table 11

		CHILLER MODEL & SERIAL NUMBERS		Chiller Type				Cooling Tower		
				Electrical		Absorption				
Building		Model Number	Serial Number	(Tonnage)	(Year)	(Tonnage)	(Year)	(Tonnage)	(Type)	(Year)
Loop 1	Pierce	ABSC022ALP01AAAFA	L99M04867M-TRANE			250	1999	250	Marley	1999
		ABSC022A0101AAADA	L95C03092-TRANE			250	1994	250	Marley	1994
		ABSC022A0101AAADA	L95C03091-TRANE			250	1994	250	Marley	1994
		RTUD 250A 2B02 A1D1	U11J01576-TRANE	250	2011					
			Loop 1 Total	**250**		**750**		**750**		
Loop 2	Halle-Library	ABTE093FLD01AAABAB	L96K07725-TRANE			852	1998	1,000	BAC	1997
	Mark Jefferson	ABSC085FLP01AAA	L98H05010-TRANE			781	1998	1,600	Marley	1967
		New with MJ Project	York	1,000	2009					
			Loop 2 Total	**1,000**		**1,633**		**2,600**		
Loop 3	John C. Porter	CVHF064FAIB03UT	L98L06781-TRANE	600	1998			499	Marley	1998
		ABSC05J0LGIFI	L92E13549-TRANE			590	1992	400	Marley	1992
								400	Marley	1992
								400	Marley	1992
	Pray-Harold	CVHR049GA4A0PCP2	L10M07001-TRANE	500	2011			860	Marley	2000
	Alexander	RTHB255FLC00EN	U95C06249-TRANE	255	1994			250	Marley	1994
								250	Marley	1994
			Loop 3 Total	**1,355**		**590**		**3,059**		
Loop 4	College of Business	CVHS300	L16M03965	320	2016			300	Evapco	2016
			Loop 4 Total	**320**		**0**		**300**		
Loop 5	Convocation Center	RTHB380FLF00	U97K05886-TRANE	380	1997			400	Marley	1997
		RTHB380FMF00	U97K05887-TRANE	380	1997			400	Marley	1997
			Loop 5 Total	**760**		**0**		**800**		
Loop 6	New Student Center	E2612BE2-A	WA5310045	372	2006			375	Evapco	2006
		E2612BE2-A	WA5310046	372	2006			375	Evapco	2006
			Loop 6 Total	**744**		**0**		**750**		
			Combined loop totals	**4,429**		**2,973**		**8,259**		

Domestic Water Supply Sub-Systems

Overview

The University water distribution system consists of approximately 13,700 feet of supply line (pipe), most of which is buried.

System Condition and Adequacy

The distribution lines on campus are of various ages and are in various conditions from poor to good

It should be noted that several of the water mains have had “temporary” repairs made on them; as such, the risk of failures increases with time. The future plan is to phase the replacement of these line sections and valves to minimize the impact on connected buildings.

Mechanical System Deficiencies by Building
Table 12

Building Name	Primary Use	Building Sq. Ft.	Year Built	2019 Building Replacement Value	Mechanical System Deficiencies
Welch Hall	non-academic	36,840	1896	$ 12,434,237	$ 2,089,800
Starkweather Hall	non-academic	8,706	1896	2,938,449	1,611,200
Total Before 1900		45,546		$ 15,372,686	$ 3,701,000
Roosevelt	academic	75,639	1924	$ 25,529,675	$ 3,270,300
Ford Hall	academic	33,333	1929	11,250,554	1,802,000
Briggs	academic	9,500	1937	3,206,440	268,180
Rackham	academic	45,890	1938	15,488,793	-
Sherzer	academic	35,253	1903	11,898,593	-
School House	academic	900	1905	846,506	-
Jones	**non-academic**	**70,491**	**1948**	**26,415,797**	**7,943,481**
McKenny	non-academic	107,103	1931	36,149,405	7,362,180
King	non-academic	61,450	1939	23,029,156	3,628,500
Pierce Hall	non-academic	61,275	1948	20,681,538	1,499,900
Pease	non-academic	30,181	1914	10,186,691	654,020
Hover	non-academic	11,021	1941	5,191,263	113,160
emu House	non-academic	1,434	1925	227,900	-
Boone Hall	non-academic	45,210	1914	15,259,279	-
Total 1900-1949		588,680		$ 205,361,591	$ 26,541,721
Warner	academic	95,349	1964	$ 32,182,195	$ 7,127,440
Sill Hall	academic	92,635	1965	31,266,165	5,300,000
John W. Porter	academic	143,775	1966	48,526,938	2,067,000
Quirk	academic	58,205	1959	19,645,352	1,787,700
Honors College	academic	21,405	1965	1,007,000	106,000
Mark Jefferson	academic	262,273	1969	127,779,514	75,000
Pray Harrold	academic	237,108	1967	80,028,693	57,240
Strong	academic	80,713	1957	27,242,252	-
Sculpture Studio	academic	4,648	1959	1,568,793	-
Goddard	non-academic	75,856	1955	28,426,277	8,301,920
Snow	non-academic	30,035	1959	14,506,022	3,710,000
Heating Plant	non-academic	23,856	1951	56,116,842	3,301,900
Central Operations	non-academic	5,665	1969	1,499,900	212,000
Total 1950-1969		1,131,523		$ 469,795,944	$ 32,046,200
Kresge Center	academic	12,606	1974	$ 4,254,777	$ 133,300
611 W. Cross Street	non-academic	4,050	1970	1,366,956	28,620
Central Stores	non-academic	10,140	1972	3,422,453	-
Total 1970-1979		26,796		$ 9,044,186	$ 161,920
Alexander	academic	86,900	1980	$ 29,330,488	$ 2,247,730
Paint Research	academic	8,000	1987	3,769,527	609,500
Total 1980-1989		94,900		$ 33,100,015	$ 2,857,230
Owen C.O.B.	academic	126,000	1990	$ 51,434,173	$ 5,835,300
Greenhouse & Aquatic Biology	academic	5,200	1998	1,755,104	509,000
Halle Library	academic	273,715	1998	92,384,288	349,800
Physical Plant	non-academic	25,300	1995	8,539,256	458,980
Total 1990-1999		430,215		$ 154,112,821	$ 7,153,080
Everett C. Marshall	academic	70,324	2000	$ 23,735,757	$ -
Parsons Center	academic	9,948	2007	$ 3,510,351	$ -
University House	non-academic	10,700	2003	4,330,450	198,220
Total Post 2000		90,972		$ 31,576,558	$ 198,220
Sitework, Drains, & Infrastructure					
Campus	non-academic	n/a	n/a	n/a	$ 10,785,500
Total Sitework, Drains & Infrastructure		n/a		n/a	$ 10,785,500
Total Building Deficiencies		**2,408,632**		**$ 918,363,801.23**	**$ 83,444,871**

Steam Supply and Distribution System

Steam Supply

Overview

The EMU Energy Center supplies steam to campus for all of its heating requirements and that portion of the cooling requirements not supplied with electric chillers. The Energy Center has completed a major upgrade replacing the 1951 Wilkes conventional fired boiler and the 1987 cogeneration system with a new cogeneration system capable of producing up to 7.8 Megawatts of power and 88,000 pounds per hour of steam at 120 psig. The two (2) 1967 Erie City conventional forced draft boilers rated at 100,000 pounders/hour each still remain.

The conventional boilers are capable of burning Natural Gas, No. 6, and No. 2 fuel oil. Presently No. 2 fuel oil is used as a backup in the event of a natural gas interruption which could result in millions of dollars of damage from frozen water lines and heating coils. In addition to physical damage to University assets, without heat normal business operations and classes would have to be canceled, and residents would not be able to stay in the residence halls. EMU affords significant benefits by having an alternative fuel capability available in the event of primary fuel supply loss. Eastern Michigan University's exposure and risks are greatly reduced by the oil tank farm.

System Condition and Adequacy

The two (2) Erie City boilers are 51 years old but serviceable. Experience has shown that at production rates above 85,000 lbs/hours they shake and vibrate to the point that operating staff are using that as the upper limit for each unit. If operated at higher rates it is expected that service problems would rise exponentially and the life expectancy of these units would be seriously impacted. Smoke stacks on both units are experiencing deterioration and will require replacement before the boilers need to be replaced.

Auxiliary systems within the plant which are required during steam production are old, but serviceable; or are being replaced on an as needed basis.

Steam Distribution Sub-Systems

Overview

The steam distribution system is a major component of the campus mechanical systems supplying the energy needed to heat the majority of the main campus building from the Energy Center. The steam distribution piping runs from the Energy Center through two tunnel systems: 1) the North loop running from the Energy Center eastward to Alexander Music Building serves most of the buildings on the North half of campus and is approximately 5,000 feet in length including a six inch spur line serving the Student Center, and 2) the South loop

which is approximately 4,600 feet in length and runs from the Energy Center southeast toward Sherzer then branching off in two directions to Pease and Goddard Hall.

The steam lines transport the steam at 40 pounds per square inch (psi) and vary in diameter from fourteen inches at the Energy Center to six inches at the far extremity between Goddard and Alexander. While the North and South tunnels are not connected, the steam lines are joined between Goddard and Alexander by this six-inch line. Additionally, an eight inch steam line provides 120 psi steam to the two-stage steam absorber at Halle Library via the South tunnel.

System Condition and Adequacy

The North and South tunnels are cast-in-place concrete, which range from poor to good condition depending on the section of tunnel in question. There is water seepage in the tunnel at various expansion joints. Some areas of the tunnel are showing signs of structural distress in the form of varying degrees of reinforcement corrosion and concrete spalling. Drainage, electrical, and ventilation needs to be improved. Pipe support systems are comprised of painted steel frames, located at twelve to fifteen foot intervals. These frames are experiencing varying stages of corrosive deterioration. The electrical service for the steam tunnels is in poor condition. The steam lines in the tunnels, expansion joints, and condensate return lines are in serviceable condition. The asbestos insulation is in serviceable condition but requires frequent maintenance. Several buried steam and condensate lines going from the steam tunnels to specific buildings show signs of failure and are in need of replacement. These include steam/condensate lines serving Snow Health Center, Sill Hall, and Starkweather. A major portion of the main steam supply to CD-1, Wise Hall, Downing Hall, and Best Hall has been replaced; however, spur lines to the individual buildings from the new main may require replacement in the future.

ELECTRICAL SYSTEMS (BUILDINGS)

Overview

The electrical system components within each building include: power transformers, switchgear, power distribution panel main breakers, electric distribution wiring, branch circuit breaker panels, motor control fuse switches and starters, receptacles, and lighting. Like mechanical systems, these systems are vital, complex and intra-dependent. Failure in one component can result in complete system failure.

System Condition and Adequacy

The average age of Electrical Systems in General Fund buildings is 27 years (8 buildings have electrical systems at least 30 years old). As these electrical systems age, replacement parts have become increasingly difficult to obtain. Furthermore, the older systems were not designed to meet contemporary technology demands. In many instances the systems are at maximum capacity limiting the University's ability to support new educational programs. Electric distribution system deficiencies include outdated inefficient lighting systems, an inadequate number of distribution circuits and panels with no spare breakers, or electric capacity. EMU's future investments in the electrical systems of campus buildings are detailed in the 2020-2024 Asset Preservation listing within the Implementation Plan later in this document.

Electrical System Deficiencies by Building
Table 13

Building Name	Primary Use	Building Sq. Ft.	Year Built	2019 Building Replacement Value	Electrical System Deficiencies
Welch Hall	non-academic	36,840	1896	$ 12,434,237	$ 657,200
Starkweather Hall	non-academic	8,706	1896	2,938,449	410,220
Total Before 1900		45,546		$ 15,372,686	$ 1,067,420
Ford Hall	academic	33,333	1929	$ 11,250,554	$ 1,199,920
Roosevelt	academic	75,639	1924	25,529,675	850,000
Sherzer	academic	35,253	1903	11,898,593	233,200
Briggs	academic	9,500	1937	3,206,440	95,400
Rackham	academic	45,890	1938	15,488,793	-
School House	academic	900	1905	846,506	-
Jones	**non-academic**	**70,491**	**1948**	**26,415,797**	**4,026,834**
Mckenny	non-academic	107,103	1931	36,149,405	1,740,000
King	non-academic	61,450	1939	23,029,156	1,600,000
Pease	non-academic	30,181	1914	10,186,691	1,359,000
Pierce Hall	non-academic	61,275	1948	20,681,538	1,346,200
emu House	non-academic	1,434	1925	227,900	26,500
Hover	non-academic	11,021	1941	5,191,263	-
Boone Hall	non-academic	45,210	1914	15,259,279	-
Total 1900-1949		588,680		$ 205,361,591	$ 12,477,054
Warner	academic	95,349	1964	$ 32,182,195	$ 3,619,900
Sill Hall	academic	92,635	1965	31,266,165	1,886,800
Quirk	academic	58,205	1959	19,645,352	852,800
John W. Porter	academic	143,775	1966	48,526,938	174,900
Mark Jefferson	academic	262,273	1969	127,779,514	163,240
Honors College	academic	21,405	1965	1,007,000	65,000
Pray Harrold	academic	237,108	1967	80,028,693	53,000
Strong	academic	80,713	1957	27,242,252	-
Sculpture Studio	academic	4,648	1959	1,568,793	-
Goddard	non-academic	75,856	1955	28,426,277	4,404,300
Heating Plant	non-academic	23,856	1951	56,116,842	500,000
Snow	non-academic	30,035	1959	14,506,022	212,000
Central Operations	non-academic	5,665	1969	1,499,900	203,000
Total 1950-1969		1,131,523		$ 469,795,944	$ 12,134,940
Kresge Center	academic	12,606	1974	$ 4,254,777	$ 245,920
611 W. Cross Street	non-academic	4,050	1970	1,366,956	60,420
Central Stores	non-academic	10,140	1972	3,422,453	-
Total 1970-1979		26,796		$ 9,044,186	$ 306,340
Alexander	academic	86,900	1980	$ 29,330,488	$ 722,920
Paint Research	academic	8,000	1987	3,769,527	53,000
Total 1980-1989		94,900		$ 33,100,015	$ 775,920
Owen C.O.B.	academic	126,000	1990	$ 51,434,173	$ 302,100
Halle Library	academic	273,715	1998	92,384,288	286,200
Greenhouse & Aquatic Biology	academic	5,200	1998	1,755,104	66,780
Physical Plant	non-academic	25,300	1995	8,539,256	120,840
Total 1990-1999		430,215		$ 154,112,821	$ 775,920
Everett C. Marshall	academic	70,324	2000	$ 23,735,757	$ 90,100
Parsons Center	academic	9,948	2007	$ 3,510,351	$ 50,000
University House	non-academic	10,700	2003	4,330,450	856,000
Total Post 2000		90,972		$ 31,576,558	$ 996,100
Sitework, Drains, & Infrastructure					
Campus	non-academic	n/a	n/a	n/a	$ 10,942,500
Total Sitework, Drains & Infrastructure		n/a		n/a	$ 10,942,500
Total Building Deficiencies		2,408,632		$ 918,363,801	$ 39,476,194

ELEVATOR SYSTEMS

Overview

The elevator equipment at Eastern Michigan University varies in age and condition. The oldest General Fund building elevator car still in service was installed in 1936. Elevators are a vital component to meet the ADA requirements and provide access to our campus buildings and facilities. There are a total of 43 elevators in General Fund buildings.

System Condition and Adequacy

All 43 elevators in General Fund buildings are maintained by the Physical Plant staff and are continuously evaluated for condition safety. There are six buildings of two or more stories that do not have elevators.

EMU's future investments in the elevator systems of campus buildings are detailed in the 2020-2024 Asset Preservation listing within the Implementation Plan later in this document.

Elevator System Deficiencies by Building
Table 14

Building Name	Primary Use	Building Sq. Ft.	Year Built	2019 Building Replacement Value	Elevator System Deficiencies
Welch Hall	non-academic	36,840	1896	$ 12,434,237	$ 86,920
Starkweather Hall	non-academic	8,706	1896	2,938,449	-
Total Before 1900		45,546		$ 15,372,686	$ 86,920
Sherzer	academic	35,253	1903	$ 11,898,593	$ 175,000
Roosevelt	academic	75,639	1924	25,529,675	37,100
Rackham	academic	45,890	1938	15,488,793	-
Ford Hall	academic	33,333	1929	11,250,554	-
Briggs	academic	9,500	1937	3,206,440	-
School House	academic	900	1905	846,506	-
Jones	**non-academic**	**70,491**	**1948**	**26,415,797**	**347,256**
Mckenny	non-academic	107,103	1931	36,149,405	318,000
King	non-academic	61,450	1939	23,029,156	298,920
Pease	non-academic	30,181	1914	10,186,691	185,500
Pierce Hall	non-academic	61,275	1948	20,681,538	174,900
Hover	non-academic	11,021	1941	5,191,263	79,500
emu House	non-academic	1,434	1925	227,900	-
Boone Hall	non-academic	45,210	1914	15,259,279	-
Total 1900-1949		588,680		$ 205,361,591	$ 1,616,176
Pray Harrold	academic	237,108	1967	$ 80,028,693	$ 598,900
Mark Jefferson	academic	262,273	1969	127,779,514	550,000
Sill Hall	academic	92,635	1965	31,266,165	386,900
Warner	academic	95,349	1964	32,182,195	159,000
Quirk	academic	58,205	1959	19,645,352	86,920
John W. Porter	academic	143,775	1966	48,526,938	82,680
Strong	academic	80,713	1957	27,242,252	-
Honors College	academic	21,405	1965	1,007,000	-
Sculpture Studio	academic	4,648	1959	1,568,793	-
Goddard	non-academic	75,856	1955	28,426,277	272,420
Central Operations	non-academic	5,665	1969	1,499,900	-
Heating Plant	non-academic	23,856	1951	56,116,842	-
Snow	non-academic	30,035	1959	14,506,022	-
Total 1950-1969		1,131,523		$ 469,795,944	$ 2,136,820
Kresge Center	academic	12,606	1974	$ 4,254,777	$ -
Central Stores	non-academic	10,140	1972	3,422,453	-
611 W. Cross Street	non-academic	4,050	1970	1,366,956	-
Total 1970-1979		26,796		$ 9,044,186	$ -
Alexander	academic	86,900	1980	$ 29,330,488	$ 296,800
Paint Research	academic	8,000	1987	3,769,527	-
Total 1980-1989		94,900		$ 33,100,015	$ 296,800
Owen C.O.B.	academic	126,000	1990	51,434,173	360,000
Halle Library	academic	273,715	1998	$ 92,384,288	$ 125,000
Greenhouse & Aquatic Biology	academic	5,200	1998	1,755,104	-
Physical Plant	non-academic	25,300	1995	8,539,256	-
Total 1990-1999		430,215		$ 154,112,821	$ 485,000
Everett C. Marshall	academic	70,324	2000	$ 23,735,757	$ 291,500
Parsons Center	academic	9,948	2007	$ 3,510,351	$ -
University House	non-academic	10,700	2003	4,330,450	-
Total Post 2000		90,972		$ 31,576,558	$ 291,500
Sitework, Drains, & Infrastructure					
Campus	non-academic	n/a	n/a	n/a	$ -
Total Sitework, Drains & Infrastructure		n/a		n/a	$ -
Total Building Deficiencies		2,408,632.00		$ 918,363,801	$ 4,913,216

FIRE PROTECTION SYSTEMS

Overview

The Fire Protection category, formerly referred to as Life Safety, within the building includes the fire alarm system, central alarm reporting system (Fireworks), fire sprinkler system, fire pumps, standpipes, portable fire extinguishers, special hazard protection systems, components of the means of egress such as exit signs and emergency lighting systems, fire doors, and eye wash/shower systems and exterior Mass Mall Notification Speaker Array System.

Systems Condition and Adequacy

The University Fire Protection systems are functional but many have aged to the point of requiring repair or replacement. The University's central reporting (Fireworks) system that reports fire and trouble alarms to the Department of Public Safety (DPS) has been updated and is complete. The University continues to schedule buildings with old conventional systems to be upgraded giving DPS the ability to receive point-specific information from buildings having addressable fire alarm systems. This information will allow DPS to know the location and nature of the alarm prior to arrival at the facility. This upgrade system will have improved reliability and redundancy with loop connectivity between all buildings.

The following buildings are completed with the ability to send this point-specific information to DPS:

- Alexander Music Building
- Ford
- Halle
- Mark Jefferson
- Parking Structure
- Pray-Harrold
- Sculpture Studio
- Warner
- Buell
- Dining Commons – 3
- Downing
- Goddard
- Indoor Practice Facility
- Pittman
- Wise

The University has completed the installation of an exterior Mass Mall Notification Speaker Array System which is up and fully functional. The system has also been installed and online in several University buildings (Buell, Downing, Goddard, Pittman, Wise, Ford, Warner, Alexander, Halle Library, Convocation Center, Dining Commons III, Mark Jefferson, Central Operations, Rackham, Pray Harrold, Indoor Practice Facility, Student Center, and the Sculpture Studio).

The University has identified over $23 million in Fire Protection System deficiency needs in General Fund buildings. EMU's future investments in the Fire Protection systems of campus buildings are detailed in the 2020-2024 Asset Preservation listing within the Implementation Plan later in this document.

Fire Protection System Deficiencies by Building
Table 15

Building Name	Primary Use	Building Sq. Ft.	Year Built	2019 Building Replacement Value	Fire Protection System Deficiencies
Welch Hall	non-academic	36,840	1896	$ 12,434,237	$ 1,878,320
Starkweather Hall	non-academic	8,706	1896	2,938,449	359,340
Total Before 1900		45,546		$ 15,372,686	$ 2,237,660
Roosevelt	academic	75,639	1924	$ 25,529,675	$ 1,091,800
Ford Hall	academic	33,333	1929	11,250,554	530,000
Sherzer	academic	35,253	1903	11,898,593	389,020
Briggs	academic	9,500	1937	3,206,440	230,020
School House	academic	900	1905	846,506	55,120
Rackham	academic	45,890	1938	15,488,793	-
Jones	**non-academic**	**70,491**	**1948**	**26,415,797**	**3,365,712**
Mckenny	non-academic	107,103	1931	36,149,405	2,501,600
King	non-academic	61,450	1939	23,029,156	1,839,100
Pierce Hall	non-academic	61,275	1948	20,681,538	982,620
Pease	non-academic	30,181	1914	10,186,691	457,920
Boone Hall	non-academic	45,210	1914	15,259,279	360,400
Hover	non-academic	11,021	1941	5,191,263	174,900
emu House	non-academic	1,434	1925	227,900	15,900
Total 1900-1949		588,680		$ 205,361,591	$ 11,994,112
Sill Hall	academic	92,635	1965	$ 31,266,165	$ 2,591,700
Warner	academic	95,349	1964	32,182,195	2,069,000
Quirk	academic	58,205	1959	19,645,352	556,500
Honors College	academic	21,405	1965	1,007,000	159,000
John W. Porter	academic	143,775	1966	48,526,938	58,300
Mark Jefferson	academic	262,273	1969	127,779,514	58,300
Strong	academic	80,713	1957	27,242,252	-
Sculpture Studio	academic	4,648	1959	1,568,793	-
Pray Harrold	academic	237,108	1967	80,028,693	-
Goddard	non-academic	75,856	1955	28,426,277	3,466,200
Snow	non-academic	30,035	1959	14,506,022	911,600
Heating Plant	non-academic	23,856	1951	56,116,842	784,400
Central Operations	non-academic	5,665	1969	1,499,900	-
Total 1950-1969		1,131,523		$ 469,795,944	$ 10,655,000
Kresge Center	academic	12,606	1974	$ 4,254,777	$ 147,340
611 W. Cross Street	non-academic	4,050	1970	1,366,956	145,220
Central Stores	non-academic	10,140	1972	3,422,453	58,300
Total 1970-1979		26,796		$ 9,044,186	$ 350,860
Alexander	academic	86,900	1980	$ 29,330,488	$ 86,920
Paint Research	academic	8,000	1987	3,769,527	56,180
Total 1980-1989		94,900		$ 33,100,015	$ 143,100
Owen C.O.B.	academic	126,000	1990	$ 51,434,173	$ 1,118,300
Halle Library	academic	273,715	1998	92,384,288	129,320
Greenhouse & Aquatic Biology	academic	5,200	1998	1,755,104	82,680
Physical Plant	non-academic	25,300	1995	8,539,256	44,520
Total 1990-1999		430,215		$ 154,112,821	$ 1,374,820
Everett C. Marshall	academic	70,324	2000	$ 23,735,757	$ 58,300
Parsons Center	academic	9,948	2007	$ 3,510,351	$ -
University House	non-academic	10,700	2003	4,330,450	-
Total Post 2000		90,972		$ 31,576,558	$ 58,300
Sitework, Drains, & Infrastructure					
Campus	non-academic	n/a	n/a	n/a	$ 5,988,300
Total Sitework, Drains & Infrastructure		n/a		n/a	$ 5,988,300
Total Building Deficiencies		2,408,632		$ 918,363,801	$ 32,802,152

ELECTRIC SUPPLY AND DISTRIBUTION SYSTEMS

Overview

The Electrical Supply and Distribution System consists of an electric substation (Coral Substation) containing two 15/20/25,000 kVa transformers supplied by two separate DTE 40 kV feeder lines. The substation is supplying the campus with power at 13,200-volts (13.2 kV). The electrical distribution system has undergone major upgrades/renovations in conjunction with the Energy Center co-generation project and the Loop 1 4,800 V to 13.2 kV conversion project.

System Condition and Adequacy

A large portion of the electrical distribution system is in good condition; however, it should be noted that the transformers and associated conductors for some of the individual buildings have exceeded their useful life and are in questionable condition. A phased approach will be needed to convert these individual transformers from 4,800 V to 13.2 kV.

SITE WORK and DRAINAGE SYSTEMS

Overview

Site work and drainage systems are integral components of primary building systems and include sidewalks, loading docks, exterior ADA improvements, and signage. An assessment of these systems has identified over $19.3 million in needed improvements. Improving these systems will protect the University's assets and enhance the image of the owner and the quality of life on campus.

System Condition and Adequacy

Since 2008, the University has spent over $2.5 million preserving the site work and draining assets of the campus systems. These systems have been continually evaluated and consequently ten miles of sidewalks has been replaced in the past eight years with additional walks to be completed in the next year. Drainage repairs have been accomplished to prevent flooding, minimize damage to building systems and landscaping. This work has included installation of new drain tile, repair of catch basins, curbing, and re-grading of certain areas. A continual campus landscape evaluation takes places to install new trees, repair turf, and revitalize landscaping on an as needed basis. Improvements adhere to ADA and building code requirements, resulting in a safer and more accessible campus.

Warner Retaining Wall	Completed	August 2008
Westview Rain Garden	Completed	Spring 2009
Eateries Plaza and Steps	Completed	July 2009
Snow/Rec IM Plaza and Steps	Completed	September 2009
Miscellaneous Retaining Walls	Completed	Summer 2010
Quirk/Sponberg Retaining Walls	Completed	Summer 2013
Porter Retaining Wall/Steps	Completed	Summer 2014
Alexander steps, walks and drainage	Completed	Summer 2015
Sculpture Studio drainage	Completed	Summer 2015
Rackham retaining walls/drainage	Completed	Summer 2015
Cornell site grading and drainage	Completed	Summer 2016
Quirk south foundation drainage	Completed	Summer 2018

Site Work and Drainage System Deficiencies by Building
Table 16

Building Name	Primary Use	Building Sq. Ft.	Year Built	2019 Building Replacement Value	Site Work & Drainage System Deficiency
Welch Hall	non-academic	36,840	1896	$ 12,434,237	$ 150,000
Starkweather Hall	non-academic	8,706	1896	2,938,449	-
Total Before 1900		45,546		$ 15,372,686	$ 150,000
Roosevelt	academic	75,639	1924	$ 25,529,675	$ 174,900
Rackham	academic	45,890	1938	15,488,793	-
Sherzer	academic	35,253	1903	11,898,593	-
Ford Hall	academic	33,333	1929	11,250,554	-
Briggs	academic	9,500	1937	3,206,440	-
School House	academic	900	1905	846,506	-
Jones	**non-academic**	**70,491**	**1948**	**26,415,797**	**1,029,525**
Pierce Hall	non-academic	61,275	1948	20,681,538	253,000
emu House	non-academic	1,434	1925	227,900	26,000
Hover	non-academic	11,021	1941	5,191,263	-
Boone Hall	non-academic	45,210	1914	15,259,279	-
Pease	non-academic	30,181	1914	10,186,691	-
King	non-academic	61,450	1939	23,029,156	-
Mckenny	non-academic	107,103	1931	36,149,405	-
Total 1900-1949		588,680		$ 205,361,591	$ 1,483,425
Sill Hall	academic	92,635	1965	31,266,165	224,720
Quirk	academic	58,205	1959	$ 19,645,352	$ -
Strong	academic	80,713	1957	27,242,252	-
Sculpture Studio	academic	4,648	1959	1,568,793	-
John W. Porter	academic	143,775	1966	48,526,938	-
Warner	academic	95,349	1964	32,182,195	-
Honors College	academic	21,405	1965	1,007,000	-
Pray Harrold	academic	237,108	1967	80,028,693	-
Mark Jefferson	academic	262,273	1969	127,779,514	-
Goddard	non-academic	75,856	1955	28,426,277	901,000
Snow	non-academic	30,035	1959	14,506,022	53,000
Heating Plant	non-academic	23,856	1951	56,116,842	-
Central Operations	non-academic	5,665	1969	1,499,900	-
Total 1950-1969		1,131,523		$ 469,795,944	$ 1,178,720
Kresge Center	academic	12,606	1974	$ 4,254,777	$ 75,000
611 W. Cross Street	non-academic	4,050	1970	1,366,956	-
Central Stores	non-academic	10,140	1972	3,422,453	-
Total 1970-1979		26,796		$ 9,044,186	$ 75,000
Alexander	academic	86,900	1980	$ 29,330,488	$ -
Paint Research	academic	8,000	1987	3,769,527	-
Total 1980-1989		94,900		$ 33,100,015	$ -
Owen C.O.B.	academic	126,000	1990	$ 51,434,173	$ 797,120
Greenhouse & Aquatic Biology	academic	5,200	1998	1,755,104	-
Halle Library	academic	273,715	1998	92,384,288	-
Physical Plant	non-academic	25,300	1995	8,539,256	-
Total 1990-1999		430,215		$ 154,112,821	$ 797,120
Everett C. Marshall	academic	70,324	2000	$ 23,735,757	$ -
Parsons Center	academic	9,948	2007	$ 3,510,351	$ -
University House	non-academic	10,700	2003	4,330,450	971,240
Total Post 2000		90,972		$ 31,576,558	$ 971,240
Sitework, Drains, & Infrastructure					
Campus	non-academic	n/a	n/a	n/a	$ 14,670,400
Total Sitework, Drains & Infrastructure		n/a		n/a	$ 14,670,400
Total Building Deficiencies		2,408,632		$ 918,363,801	$ 19,325,905

ENERGY PLAN GOALS

The goals of the Eastern Michigan University Energy Plan are as follows:

Conserve electricity on campus by using the following methods:

- Invest in projects that reduce electrical use. Projects may include:
  - Lighting retrofits
  - Lighting controls
  - Motor replacements
  - Equipment scheduling
  - Building use optimization
  - Computer upgrades
  - Variable frequency drive installations
  - Cooling system upgrades

- Measure and monitor electricity use throughout campus.

Conserve natural gas on campus by using the following methods:

- Invest in projects that will result in reduced natural gas use. Projects may include:
  - Steam trap repairs/replacements
  - Insulation of piping and ductwork
  - Heat recovery
  - Equipment scheduling
  - Building use optimization
  - Boiler replacements
  - Boiler control upgrades
  - Heat exchanger replacements
  - Conversion of steam to hot water
  - Heating reset schedules
  - Window replacements

ROADS, STREETS, PARKING LOTS AND STRUCTURES

Overview

The University Parking and Roadway System contains sixty primary parking lots, multiple specialized parking lots, and two parking structures for a total of 9,709 parking spaces. The System also contains 5.75 miles of roads, 11.5 miles of curbs, and 31 miles of sidewalks, providing access to all points on campus for pedestrian and vehicular traffic.

System Condition and Adequacy

EMU's future investments in the University Parking and Roadway System are detailed in the University's Parking 5 Year Plan.

University Parking
5-year Plan
2020-2024
Table 17

Lot Name	Lot Condition	Action	Est. Cost
Fiscal Year 1 - 2020			
East Circle Drive - Phase II	Poor	Replacement	$ 700,000
Estimated Year Total			$ 700,000
Fiscal Year 2 - 2021			
Oakwood Student Center Improvements	Poor	Renovation	$ 900,000
Estimated Year Total			$ 900,000
Fiscal Year 3 - 2022			
West Circle Drive - Phase I	Fair	Replacement	$ 600,000
Estimated Year Total			$ 600,000
Fiscal Year 4 - 2023			
Rynearson Zones 3-4	Failed	Replacement	$ 600,000
Estimated Year Total			$ 600,000
Fiscal Year 5 - 2024			
West Circle Drive - Phase II	Failed	Replacement	$ 1,200,000
Estimated Year Total			$ 1,200,000
Five Year Project Total			$ 4,000,000

Jones Hall
(Phase 2)
From Southeast

IMPLEMENTATION PLAN

COLLEGE of TECHNOLOGY

ENGINEERING PROGRAM GROWTH AND EXPANSION

Sill Hall /Jones Hall

EASTERN MICHIGAN UNIVERSITY

Building Maintenance Projects > $1 Million

COLLEGE of TECHNOLOGY ENGINEERING PROGRAM GROWTH and EXPANSION

Is the Project a renovation or new construction?	Ren (X)	New (X)
Is there a 5-Year Master Plan available?	Yes (X)	No ( )
Are professionally-developed Program Statements and/or Schematic Plans available now?	Yes (X)	No ( )
Are Match Resources currently available?	Yes (X)	No ( )
Has the University identified available Operating Funds	Yes (X)	No ( )

Executive Summary

Eastern Michigan University (EMU) is developing a comprehensive **Engineering and Technology Complex to accommodate its new academic programs in Mechanical Engineering, Electrical & Computer Engineering, and Civil Engineering, as well as its existing engineering technology programs**. Nearly 90% of EMU's students come from Michigan, and approximately 72% of our graduates remain in Michigan after graduation. These new high-demand technology-focused programs will therefore prepare Michigan residents for high-demand, high-wage engineering careers to continue growing Michigan's economy. The new Engineering and Technology Complex includes (1) renovation and expansion of Sill Hall, which will be fully-funded by the University, and (2) a comprehensive renovation and expansion of nearby Jones Hall, which is currently vacant. In sum, this project will create a significant new pipeline for engineering students in Michigan while also re-purposing an aging building and creating an integrated engineering technology campus with close partnerships to Michigan businesses.

Introduction

Michigan has seen a considerable transformation in both demographics as well as business and industrial needs. Certain disciplines in technology are no longer attracting enough students to remain sustainable while businesses and industries are coping with a deficiency of qualified engineers. Furthermore, many high school graduates are demanding more career-driven disciplines that can assure reasonable career success. With the ever-changing and increasing world of technology, there is a vastly increasing need for educated and qualified engineers in Michigan and throughout the country. To respond to these realities, and to enhance the investments made and committed in EMU's laboratories, classrooms and faculty, the EMU College of Technology is committed to improving and expanding its engineering program offerings to meet the current and future needs of Michigan's economy.

EMU's College of Technology currently offers diverse academic programs including seventeen (17) baccalaureate programs and ten (10) graduate degrees and certified programs through its five Schools:

- Engineering Technology
- Information Security and Applied Computing
- Technology and Professional Services Management
- Visual and Built Environments
- Military Science and Leadership

Through planning and benchmarking, the College has reviewed the current and planned programs and facilities to develop a program and Master Plan to support long and short-term College goals. With new programs in Mechanical Engineering, Electrical and Computer Engineering, and Civil Engineering, as well as expansions of our existing engineering technology programs, the College of Technology projects growth from the current 2,300 students to approximately 3,800-4,000 students (an increase of more than 65%) in the next ten to fifteen (10-15) year period. Demographic studies have indicated approximately 72% of Eastern Michigan students stay in Michigan for their careers; these new programs will therefore support Michigan's economy.

In comparing the current College of Technology facilities to peer institutions, the College is undersized by about 25% of available gross square footage per student with an average of 74 gsf/student. EMU has developed a two-pronged plan for "right-sizing" the College for the current student population, along with a proposed plan to meet the needs of an increased class size for approved and future planned program offerings.

The Master Plan to meet the current and future needs of the College of Technology, Engineering Program Growth and Expansion involves renovations and additions to Sill Hall to right size for current offerings, and renovations and additions to Jones Hall to create room for new and future growth.

In addition to adding dedicated program space, it is essential that the right types of space are provided to support them. Beyond lab and classroom space, it is important to include areas for students to learn by doing hands on activities and student collaboration/teaming areas. Highlights of these support spaces include;

- Maker Spaces
- Specialty Labs
- Computer/Simulation Labs
- Virtual and Augmented Reality Labs
- Research Labs
- Student Success Suites
- Student Collaboration areas
- Student Organization and Support areas

Engineering Program Growth Plan

EMU's Board of Regents approved a Mechanical Engineering program in February 2017. This discipline accepted Freshmen, Sophomore and Junior level students beginning with the Fall Semester 2017. All student levels are expected to be represented in the Fall Semester 2018. The program plans to offer Graduate level programs beginning in the Fall Semester 2021 pending Regent approval.

The Board of Regents approved the Electrical and Computer Engineering program in October 2017. The University will start with Freshmen and Sophomores in the Fall Semester 2018. All student levels are expected to be represented in the Fall Semester 2020. Graduate level programs are proposed to begin in Fall Semester 2021.

Pending Regent approval, Civil Engineering will start in the Fall Semester 2019 with Freshmen and Sophomore student representation. All students are expected to be represented in the Fall Semester 2021. Graduate level programs are proposed to begin in Fall Semester 2022.

Other Engineering Program disciplines, such as Chemical Engineering and Industrial Engineering, are in the planning stages with the intent of offering classes in the Fall Semester of 2021 or 2022.

To meet these program needs, it is estimated an additional 75,000 sf of advanced program space will need to be created.

Renovation of Sill Hall – Local Capital Efforts

The modernization of Sill Hall was identified as the first priority of meeting the Engineering Program needs. To that end, EMU's Board of Regents approved a $40 million renovation and addition project for Sill Hall in December 2017. This project is currently in design development with construction scheduled to commence in January 2019 and for completion in August 2020.

Sill Hall, built in 1965, is composed of three distinct areas: a single-story, high-bay structure; a two-story classroom and administrative support structure; and a single-story lecture hall area. These three areas comprise a total of 92,635 gsf.

The high-bay structure provides large volume space for advanced laboratory utilization needs that are important to the Mechanical Engineering discipline such as:

- Manufacturing Lab
- Automotive Lab
- Thermo-Fluids Lab
- Casting/Welding Lab
- Robotics Lab
- Plastics Lab

While the space provides area for the Mechanical Engineering program needs, the existing infrastructure and building systems do not meet the engineering programs' advanced needs, and do not offer any ability for expansion and growth. The project will fully renovate the building systems, components and finishes, as well as increase systems capacity to meet the growth needs and provide for the future.

In addition to renovating the single-story, high-bay portion of Sill, the two-story structure would also be reconfigured and renovated to create general teaching labs, classrooms and student collaboration areas for Mechanical and Electrical/Computer Engineering disciplines.

The third area containing the Lecture Halls has undergone minor renovations to interior finishes, but the supporting building systems are beyond their useful life and will be replaced. Additionally, remote office spaces would be relocated, with the areas reconfigured as student "Maker's Space" and collaboration areas.

Condition Assessments have identified Sill Hall as having the greatest need for updating the building enclosure and building systems compared to all the COT buildings. Combining the programmatic improvements with new building systems, building envelope and learning environment will be the first step in meeting the Engineering Program needs.

The project will include full replacement of HVAC, plumbing, electrical and fire suppression systems, as well as use of modern, sustainable interior finish materials and systems. The project will be designed in compliance with the Americans with Disabilities Act, and will strive for LEED Silver certification. The project budget for this phase is $40 million and is intended to be funded locally through various sources.

Engineering and Technology Complex - State Capital Outlay Request

EMU is pleased to submit our State Capital Outlay Request for FY2020. While the renovation of Sill Hall is underway, it is only the first phase of the overall effort and cannot provide the additional area needed to meet the engineering programs' immediate and future growth. Sited between the two major College of Technology facilities (Sill Hall and Roosevelt Hall) stands Jones and Goddard Halls. Originally constructed as residence halls, and closed from use in 2005, the halls have only seen use as temporary swing-space storage for equipment and furnishings from other capital projects. Now in severe need of renovation and restoration, the University has developed a plan to first utilize Jones Hall, combined with selective demolition and a corresponding advanced-technology addition to provide not only the additional square footage needed for the engineering programs, but also create a "Engineering and Technology" campus within the University's borders. This program-based campus approach will increase student interaction, expand interdisciplinary instruction, and offer flexible learning spaces for modern and future teaching pedagogies.

Built in 1948 and containing 70,491 sf, Jones Hall will take the lead in repurposing these classic structures as the new Engineering and Technology Complex. The adjacent Goddard Hall is being reserved for other future uses by the College and the University.

The adaptive reuse of Jones Hall is a goal and priority of EMU and the College of Technology because it is key to expanding EMU's growing Engineering and Technology Programs. This project will include partial demolition of the east wings of Jones Hall to make way for a new 29,000 sf building addition. The addition will connect to the remaining 44,000 sf of Jones Hall through a series of connecting walkways. The two joined facilities will provide distinct services for College offices and student organization spaces (In Jones Hall) and high tech laboratories and open collaborative spaces in the new addition. The open east exposure will allow for visual and physical connections to the existing Sill Hall, thereby creating a College of Technology micro-campus.

The combined 73,000sf of additional space will support the implementation and growth of the following programs:

1. Mechanical Engineering
2. Electrical and Computer Engineering
3. Civil Engineering

Supporting these programs and others within the College, this project will also create space for:

1. Student Engineering and Technology Organizations
2. Student Advising Centers
3. Professional Business and Community Outreach
4. College of Technology Dean's Office
5. Expanded Faculty Offices
6. Student Collaboration and Maker's Spaces
   Currently Jones Hall has over $27 million in deferred maintenance and asset preservation needs, including:

- Outdated room layouts, orientations and sizing;
- Obsolete and failed mechanical systems;
- Obsolete and failed plumbing systems;
- Obsolete and failed electrical systems;
- Energy inefficient windows and other building envelope systems;
- Inadequate handicap (ADA) accessibility; and
- Interior systems and finishes have failed and been damaged.

While offline from use and mothballed to protect from weather damage, the condition and prime location of these buildings led the University to seek alternative uses and planning solutions. This project will provide for a complete renovation of all building systems and components for Jones Hall as well as setting systems in place for the future full renovation of Goddard Hall, allowing for further growth of engineering and advanced technology programs.

The project is expected to cost $40 million which will provide for:

- Selective demolition of the east wings of Jones Hall,
- Renovation of 44,000 sf of Jones Hall for all college, academic and student life support spaces, and

- An addition of 29,000 sf to house classrooms, lecture halls, advanced laboratories, student collaboration and Maker's Spaces.

The combined facility will feature flexible uses for both instructional and research needs, as well as provide adaptability to future trends in engineering, and expansion possibilities for future growth.

The project will include full replacement of HVAC, plumbing, electrical and fire suppression systems, as well as use of modern, sustainable interior finish materials and systems. The project will be designed in compliance with the Americans with Disabilities Act, and will strive for LEED Silver certification.

Operating Costs – Engineering and Technology Complex

While currently offline, Jones Hall nonetheless incurs minimal maintenance and operating costs. Once the project is completed, the increase in overall operating costs from a fully functioning and occupied facility will be offset through gains in operating efficiencies and increased space utilization from the growth of engineering programs. Over the past three years, the University has invested approximately $30 million in various energy savings projects which include the replacement of its Co-Generation system and replacement of lighting, plumbing and controls systems. These projects have addressed financial and operational risks on both the demand and supply side of the University's energy needs. The University can now generate over 90% of its electrical and heat needs at approximately half the cost of buying this energy from a utility provider. Additionally, by replacing inefficient lighting, plumbing and controls systems, the University has decreased its electrical needs across the campus. Typically, newly renovated buildings operate at 20-25% energy savings while providing better, more adaptable learning environments.

All operating costs are funded through the University's General Fund.

Overall Program "Capital Project" Costs

The total project is estimated to cost $80,000,000 broken down in the following components:

Sill Hall Renovation (Locally Funded)		$40,000,000
Construction Costs	$31,650,000	
Administrative Costs and Fees	$ 3,900,000	
Owners Costs	$ 4,450,000	
Engineering and Technology Complex (State Capital Request)		**$40,000,000**
Construction Costs	$31,500,000	
Administrative Costs and Fees	$ 4,000,000	
Owners Costs	$ 4,500,000	
TOTAL ENGINEERING AND TECHNOLOGY PROGRAM INVESTMENT:		$80,000,000

Other Alternatives Considered

Total demolition of Jones Hall combined with a renovation and expansion of Sill Hall was considered and abandoned for numerous reasons including the cost implications of replacement versus renovation of the existing Jones Hall, and the expectation that replacement of the usable square footage could cost up to 25% more than renovation. Additionally, the lower levels of Jones Hall house centralized campus systems (steam, chilled water, and fiber-optic data) that would be cost-prohibitive and disruptive to move. The central location of Jones Hall between Sill Hall and Roosevelt Hall offers the ability to create a "micro-campus" dedicated to engineering and technology studies. Finally, the University's effort to maintain sustainable practices supports the revitalization of existing structures as opposed to building new structures. This point is emphasized with the gain in space utilization in bringing an offline building back into use.

Jones Hall is centrally located within the College of Technology's existing facilities in the academic core of campus -- close to residence halls, other academic facilities, library, and parking. The building's structure is in good condition and therefore warrants renovation rather than a new building. Finally, demolition of Jones Hall would leave a void within the fabric of the University that would affect the campus aesthetics as well as pedestrian flow, and potentially be utilized for uses not congruent with the College of Technology.

EMU is the second oldest public university in the State of Michigan. The state's investment in buildings and infrastructure should be preserved when possible and financially feasible to do so. The construction costs associated with a new building were carefully studied and found not to be fiscally prudent, given the constraints on available state and institutional funds for capital projects. We believe, when possible, existing buildings that are structurally sound should be renovated and modernized as opposed to razing buildings for new structures.

Programmatic Benefit to State Taxpayers and Specific Clientele or Constituencies

The programmatic benefit of this project will be to better serve current and future students through enhanced learning spaces and technology and to help the University recruit and retain students and faculty. Importantly, nearly 90% of EMU's students come from Michigan and approximately 72% of our graduates remain in Michigan after graduation. This project will therefore provide an important infusion of highly-trained engineers to stay in Michigan and help fuel Michigan's economy.

EMU's Engineering and Technology Complex will provide economic benefit to the City of Ypsilanti and the eastern Washtenaw County area through the creation of critically needed new construction jobs over three years. EMU has a significant impact on the local economy. For this area of Washtenaw County, it is imperative that EMU remain a vital and vibrant institution. It should be noted upon successful completion of this project, EMU will have renovated three of our four oldest non-improved buildings on campus, thereby continuing our systematic approach to sustainable design through renovation and adaptive reuse of these aging but historic structures.

Funding Resources

EMU would utilize its existing financial reserves to fund the project with the State.

BUILDING MAINTENANCE PROJECTS GREATER THAN $1M (FY2020-2024)

Project Name:		Amount:
Strong Hall Renovation*		$ 9,884,000
Rec IM Renovations		$16,000,000
Energy Conservation Measures (ECM) Project – Phase IV**	$1,000,000 /	$ 8,500,000
Alexander Building Envelope		$ 7,450,000
Total Building Projects Greater than $1 Million:	**$7,200,000 /**	**$46,184,000**

**University matching funds for State Capital Outlay Project*

*** Multiyear Project – Remaining Balance/Total Funding*

APPENDIX 1

LIST OF TABLES & EXHIBITS

APPENDIX 2

Fall 2018 Undergraduate & Graduate Enrollment

By College, Department and Major

Fall 2018 Undergraduate Enrollment by College, Department and Major

College	Department	Major	Full-time	Part-time	Grand Total
AA	Continuing Education	Continuing Education	0	1	1
	University - General Studies	Early College Alliance	117	145	262
		ESL Intensive English Language	27	2	29
		Exploratory	490	77	567
		Guest/Self Improvement	5	29	34
		Individualized Studies Program	24	33	57
		Individualized Studies-Intent	5	20	25
		Undeclared	21	178	199
AA Total			**689**	**485**	**1,174**
AS	Africology&African Amer Studies	African American Studies	16	1	17
		Africology/African Am Studies	1	0	1
	Biology	Biology	328	94	422
		Biology - Teaching	3	0	3
		Pre-Chiropractic	2	0	2
		Pre-Medicine/Osteopathy	99	8	107
		Pre-Optometry/Podiatry	4	0	4
		Pre-Veterinary	44	3	47
	Chemistry	Biochemistry	57	5	62
		Biochemistry - General	59	17	76
		Chemistry	51	9	60
		Chemistry - General	18	4	22
		Chemistry - Teaching	3	0	3
		Fermentation Science	1	2	3
		Pre-Dentistry	23	0	23
		Pre-Mortuary Science	3	0	3
		Pre-Pharmacy	15	3	18
		Professional Biochemistry	7	1	8
		Professional Chemistry	5	3	8
	Comm, Media & Theatre Arts	Arts and Entertainment Mgmt	41	6	47
		Comm, Media & Thtr Arts Comp	21	6	27
		Comm, Theatre Arts - Teaching	8	4	12
		Communication	276	81	357
		Communication and Theatre Arts	4	2	6
		Digital Media Production	15	7	22
		Electrnc Media/Film -Film Conc	22	5	27
		Electronic Media-Film Studies	110	30	140
		Entertainment Design/Tech	27	4	31
		Journalism	42	9	51
		Media Studies and Journalism	40	7	47
		Public Relations	38	6	44
		Theatre Arts	64	4	68

College	Department	Major	Full-time	Part-time	Grand Total
AS (continued)	Computer Science	Computer Science	93	35	128
		Computer Science Applied	207	75	282
	Economics	Actuarial Science and Economic	5	0	5
		Economics	43	9	52
		Economics - BBA	6	5	11
		Economics - BBA Intent	8	0	8
	English Language & Literature	Child Lit/Drama/Thtr for Young	3	2	5
		Creative Writing	35	12	47
		English Language	25	9	34
		English Linguistics	27	8	35
		Language, Literature and Writg	39	13	52
		Language, Litr, Writg - Tchrs	79	22	101
		Literature	11	7	18
		Public Relations	20	8	28
		Written Communication	22	6	28
	Geography & Geology	Earth Science	13	6	19
		Earth Science - Teaching	2	0	2
		Geography	20	7	27
		Geography/History Comp Maj	1	0	1
		Geology	21	14	35
		Geospatial Info Sci & Tech	14	1	15
		Urban and Regional Planning	18	1	19
	History & Philosophy	History	88	35	123
		History/Geography Comp Maj	3	4	7
		Philosophy	21	8	29
		Religious Studies	1	0	1
		Social Stu/Economics Comp Maj	1	0	1
		Social Stu/Geography Comp Maj	3	0	3
		Social Stu/History Comp Maj	62	18	80
		Social Stu/Poli Sci Comp Maj	5	1	6
	Interdiscip Arts & Sciences	Data Science & Analytics	9	2	11
		Environ Sci & Society Interdis	35	10	45
		Interdisc Environ Sci/Society	43	19	62
		Neuroscience Interdisciplinary	73	6	79
	Mathematics and Statistics	Actuarial Science and Economic	19	4	23
		Elem Ed Math Comprehensive	12	1	13
		Elementary Educ Mathematics	26	16	42
		Mathematics	43	20	63
		Mathematics/ConcentrStatistics	9	4	13
		Mathematics-Secondary Educ	56	6	62
	Music and Dance	Dance	15	4	19
		Music	45	8	53
		Music Education - Intent	24	1	25
		Music Education, Instrumental	58	9	67
		Music Education, Vocal	26	3	29
		Music Performance	16	5	21
		Music Therapy	59	13	72
		School of MUSD - Intent	1	0	1
	Physics and Astronomy	Integrated Science Sec Teach	12	1	13
		Physics	12	3	15
		Physics - Teaching	1	2	3
		Physics-Engineering	13	8	21
		Physics-Research	7	4	11
		Science Lit for Earth Science	1	0	1
		Science Literacy for Bio	2	0	2
		Science Literacy for Chemistry	2	0	2
		Science Literacy for Physics	1	0	1

College	Department	Major	Full-time	Part-time	Grand Total
AS (continued)	Political Science	Combined MPA Program - Intent	1	0	1
		International Affairs	46	10	56
		Political Science	152	17	169
		Political Science - Teaching	0	1	1
		Pre-Law Undeclared	19	5	24
		Public Administration	1	2	3
		Public and Nonprofit Administr	22	5	27
		Public Law and Government	0	1	1
		Public Safety Administration	8	11	19
	Psychology	Psychology	628	152	780
	School of Art and Design	Art	109	51	160
		Art - 30 Hour	35	7	42
		Art - Teaching	1	1	2
		Art History	8	4	12
		K-12 Visual Art Education	22	4	26
	Sociology/Anthro/Criminology	Anthropology	47	15	62
		Criminology and Criminal Justc	400	85	485
		Sociology	42	12	54
	Women's and Gender Studies	Women's and Gender Studies	15	5	20
	World Languages	French	9	0	9
		French - Teaching	2	3	5
		German Language and Literature	3	0	3
		Japanese Lang, Cult -Teaching	2	0	2
		Japanese Language & Culture	37	10	47
		K12 Certification in French	1	0	1
		K12 Certification in German	1	1	2
		K12 Certification in Spanish	5	0	5
		Lang & Int'l Careers - French	2	1	3
		Lang & Int'l Careers - Spanish	5	0	5
		Language & Int'l Careers	10	4	14
		Language and Internatnl Trade	10	0	10
		Spanish	10	4	14
		Spanish - Teaching	3	1	4
		Tchng Eng to Spkrs Other Langs	1	0	1
		TESOL	1	0	1
AS Total			**4,621**	**1,188**	**5,809**
BU	Accounting & Finance	Accounting	68	47	115
		Accounting Information Sys-Int	4	1	5
		Accounting Information Systems	4	4	8
		Accounting/Accounting 150 hrs	62	16	78
		Accounting/Accounting 150 Int	1	0	1
		Accounting/Taxation 150 hr Int	11	1	12
		Accounting/Taxation 150 hrs	2	1	3
		Accounting-Int	118	32	150
		AIS/Accounting 150 hrs	2	0	2
		Finance	76	31	107
		Finance-Intent	67	17	84
	Business Administration	Business Administration-Undecl	190	38	228
		International Business	2	0	2
		International Business-Intent	37	5	42
	Computer Information Systems	Computer Information Sys-Intnt	22	12	34
		Computer Information Systems	37	24	61
	Management	Entrepreneurship	19	5	24
		Entrepreneurship-Intent	43	5	48
		General Business	23	35	58
		General Business-Intent	66	21	87
		Management	112	62	174
		Management-Intent	78	30	108

College	Department	Major	Full-time	Part-time	Grand Total
BU (continued)	Marketing	International Bus/Accounting	1	0	1
		International Bus/Economics	2	1	3
		International Bus/Finance	1	0	1
		International Bus/Gen Bus	1	0	1
		International Bus/Management	3	2	5
		International Bus/Marketing	7	1	8
		International Bus/SupplChnMgmt	2	0	2
		Marketing	147	52	199
		Marketing-Intent	169	30	199
		Supply Chain Management	72	49	121
		SupplyChain Management Intent	48	21	69
BU Total			**1,497**	**543**	**2,040**
ED	Special Education	Elem Cognitive Impairment	51	22	73
		Elem Emotional Impairment	8	10	18
		Elem Phy/Other Health Impair	1	0	1
		Elem Speech/Language Impair	6	1	7
		Elem Visual Impairment	0	1	1
		K-12 Autism Spectrum Dis - Elm	26	3	29
		K-12 Autism Spectrum Dis - Sec	9	0	9
		Secdry Cognitive Impairment	25	10	35
	Special Education (continued)	Secdry Emotional Impairment	4	2	6
		Secdry Speech/Language Impair	1	0	1
		Spec Ed Learning Dis - Elem	14	3	17
		Spec Ed Learning Dis - Sec	8	0	8
		Special Education-Undeclared	55	13	68
		Speech & Language Pathology	2	0	2
		Speech/Lang Path - Health Care	86	20	106
	Teacher Education	Children and Families	47	18	65
		Early Childhood Education	26	22	48
		Elem Ed Early Childhood Comp	107	32	139
		Elem Ed Integrated Sci Comp	7	1	8
		Elem Ed Language Arts Comp	46	9	55
		Elem Ed Reading Comprehensive	14	7	21
		Elem Ed Social Studies Comp	16	3	19
		Elementary Education-Intent	144	17	161
		Integrated Science El Teaching	17	5	22
		Language Arts Group	8	7	15
		Liberal Arts Elementary Tchg	4	2	6
		Reading	4	1	5
		Secondary Education-Intent	87	15	102
		Social Studies Grp for Elem Ed	5	8	13
		Teacher Prep - Elementary	9	6	15
		Teacher Prep - Secondary	21	28	49
		Two Minors - Elem Ed	80	17	97
ED Total			**938**	**283**	**1,221**

College	Department	Major	Full-time	Part-time	Grand Total
HH	School of Health Sciences	Clin Lab Sci - Cytogenetics	4	1	5
		Clin Lab Sci - Histotechnology	4	1	5
		Clin Lab Sci - Med Lab PreProf	9	0	9
		Clin Lab Sci - Med Lab Sci Int	3	2	5
		Clin Lab Sci - Med Lab Science	15	6	21
		Clinical Lab Sciences (Clinic)	25	9	34
		Clinical Lab Sciences (Profes)	8	1	9
		Combined OT (BS/MOT)	22	0	22
		Dietetics	37	1	38
		Dietetics-Intent	41	76	117
		Health Administration	81	40	121
		Health Administration Intent	79	49	128
		Health Informatics	1	0	1
		Pre-OT	116	17	133
		Public Health	27	13	40
		Public Health - Intent	27	9	36
		Therapeutic Recreation	57	34	91
	School of Hlth Prom/Human Perf	Athletic Training	5	0	5
		Athletic Training Educ-Intent	9	1	10
		Combined Athl Trng - Intent	34	4	38
		Exercise Science	40	22	62
		Exercise Science-Intent	168	14	182
		K-12 Physical Ed Tchg - Intent	7	1	8
		K-12 Physical Education Tchng	9	1	10
		Physical Education	0	1	1
		Physical Education Teaching	1	1	2
		Sport Management	82	15	97
		Sport Management - Intent	97	12	109
		Sport Perf & Fitness Entr	73	12	85
		Sports Medicine-Intent	1	2	3
	School of Nursing	Nursing	231	29	260
		Nursing - 2nd Bachelor	42	22	64
		Nursing - BSN Completion	0	7	7
		Nursing - Collaborative WCC	0	6	6
		Nursing (Completion)-Intent	24	7	31
	School of Nursing (continued)	Nursing Intent	486	108	594
		RN to BSN Nursing	37	592	629
		RN to BSN Nursing - Intent	1	86	87
	School of Social Work	Social Work	232	92	324
		Social Work - Intent	179	60	239
HH Total			**2,314**	**1,354**	**3,668**
TC	Engineering Tech, School of	Applied Tech (Transfer)	1	5	6
		Computer Engineering Tech	103	16	119
		Electrical & Comp Engineering	16	3	19
		Electronic Engineering Technol	38	21	59
		Industrial Technology-Undeclrd	2	1	3
		Mechanical Eng Tech - Intent	65	10	75
		Mechanical Engineering	23	2	25
		Mechanical Engineering -Intent	73	13	86
		Mechanical Engineering Technol	50	10	60
		Pre-Engineering	11	1	12
		Product Design & Development	51	26	77
		Product Dsgn Engineering Tech	4	2	6
	Info Sec & App Comp, School of	Info Assrnce & Cyber Def - Int	10	2	12
		Info Assurance & Cyber Defense	117	35	152
		Information Assurance	31	30	61
		Information Technology	3	0	3
		Information Technology -Intent	2	1	3

College	Department	Major	Full-time	Part-time	Grand Total
TC (continued)	Tech & Prof ServMgt,School of	Aviation Flight Tech	29	17	46
		Aviation Flight Tech - Intent	65	5	70
		Aviation Management Technology	35	9	44
		Aviation Mgmt Tech - Intent	14	3	17
		Bus, Mgmt, Mktg, Tech	39	9	48
		Hotel and Restaurant Mgmt	55	18	73
		Industrial Distribution	0	1	1
		Legal Assistant	1	4	5
		Paralegal	15	12	27
		Paralegal - Intent	13	8	21
		Technology Management	28	70	98
	Technology Studies, School of	Info Assrnce & Cyber Def - Int	10	2	12
	Visual&Built Envmt, School of	Apparel, Textile Merchandising	49	26	75
		Communication Technology	20	8	28
		Construction Management	102	43	145
		Interior Design	82	16	98
		Pre-Architecture	5	3	8
		Simulation, Animation & Gaming	182	42	224
TC Total			**1,344**	**474**	**1,818**

Fall 2018 Graduate Enrollment by College, Department and Major

College	Department	Major	Full-time	Part-time	Grand Total
AA	Graduate Studies - University	Undeclared	1	23	24
	University - General Studies	Guest/Self Improvement	0	6	6
AA Total			**1**	**29**	**30**
AS	Africology & African Amer Studies	African American Studies	0	1	1
		Africology/African Am Studies	1	1	2
	Biology	Ecology, Evolution & Organ Bio	2	14	16
		Biology General	3	6	9
		Molecular/Cellular Biology	3	12	15
	Chemistry	Chemistry	3	29	32
	Comm, Media & Theatre Arts	Applied Drama/Theatre Young	6	1	7
		Arts Administration	7	5	12
		Communication	7	18	25
		Interp/Performance Studies	0	1	1
		Theatre Arts - Drama/Theat/Yng	0	1	1
		Theatre Arts - General	2	1	3
		Theatre Arts - Interp/Perform	3	0	3
	Computer Science	Computer Science	27	19	46
	Economics	Applied Econometrics	1	2	3
		Applied Economics	0	3	3
		Economics	1	1	2
		Health Economics	4	2	6
		International Econ & Devlpmnt	4	1	5
		Trade & Development	2	0	2
	English Language & Literature	Children's Literature	5	7	12
		Creative Writing	5	7	12
		English Linguistics	2	6	8
		English Studies for Teachers	0	3	3
		Literature	2	9	11
		Written Communication	4	11	15

College	Department	Major	Full-time	Part-time	Grand Total
AS (continued)	Geography & Geology	Earth Science Education	0	1	1
		Geographic Info Systems	5	10	15
		GIS Professional	0	1	1
		Historic Preservation	7	34	41
		Transportation Plng & Model	0	1	1
		Urban and Regional Planning	2	5	7
	History & Philosophy	History	6	27	33
		Philosophy	4	10	14
		Social Science	0	6	6
	Mathematics and Statistics	Applied Statistics	5	8	13
		Mathematics	5	13	18
	Music and Dance	Music Education	0	2	2
		Music Performance	2	6	8
		Piano Pedagogy	0	1	1
	Physics and Astronomy	Physics	0	7	7
		Physics/Physics Education	0	2	2
	Political Science	Mgmt Public Healthcare Svcs	1	1	2
		Nonprofit Management	1	5	6
		Public Administration	19	31	50
	Psychology	Clinical Behavioral Psychology	16	2	18
		Clinical Psych Pre-Doctorate	0	1	1
		Clinical Psychology	22	3	25
		Clinical Psychology - PhD	17	26	43
		Psychology	3	5	8
	School of Art and Design	K-12 Visual Art Education	0	4	4
		Studio Art - MA	2	3	5
		Studio Art - MFA	10	1	11
	Sociology/Anthro/Criminology	Criminology and Criminal Justc	4	12	16
		Cultural Museum Studies	0	1	1
		Schools, Society and Violence	1	2	3
		Sociology	4	8	12
	Women's and Gender Studies	Women's and Gender Studies	2	11	13
	World Languages	French	0	2	2
		German	0	2	2
		Japanese Language Teaching	0	1	1
		Language and Internatnl Trade	0	1	1
		Spanish	0	6	6
		TESOL	5	66	71
AS Total			**237**	**489**	**726**
BU	Accounting & Finance	Accounting	9	30	39
		Accounting/Accounting 150 hrs	26	18	44
		Accounting/Taxation 150 hrs	6	4	10
		AIS/Accounting 150 hrs	3	3	6
		Taxation	2	5	7

College	Department	Major	Full-time	Part-time	Grand Total
BU (continued)	Business Administration	Business Administration	17	89	106
		Business Analytics	3	6	9
		E-Business	3	3	6
		Entrepreneurship	2	0	2
		Finance	18	17	35
		Human Resources	6	44	50
		Information Systems	5	5	10
		Internal Auditing	0	3	3
		International Business	0	2	2
		Management	6	27	33
		Marketing	2	12	14
		Nonprofit Management	0	7	7
		Organizational Development	0	4	4
		Sport Management	2	1	3
		Supply Chain Management	3	15	18
	Computer Information Systems	Information Systems	13	12	25
	Management	Entrepreneurship	2	8	10
		Human Resource/Org Dev-China	30	0	30
		Human Resource/Org Develpmnt	5	66	71
	Marketing	Integrated Marketing Comm	31	32	63
BU Total			**194**	**413**	**607**
ED	Leadership & Counseling	Academic Advising	1	0	1
		Basic School Admin	1	28	29
		Clinical Mental Health Counsel	20	30	50
		College Counseling	5	3	8
		Educational Leadership	2	104	106
		Higher Ed General Admin	0	10	10
		Higher Ed Student Affairs	24	42	66
		K12 Administration	14	90	104
		School Counseling	4	9	13
	Special Education	Autism Spectrum Disorders	4	31	35
		Cognitive Impairment	1	8	9
		Emotionally Impaired	0	2	2
		Learning Disabilities	2	13	15
		Physic,Otherwise Hlth Impaired	0	2	2
		SEM-T El Ed Cognitive Impair	9	4	13
		SEM-T El Ed Emotional Impair	1	1	2
		SEM-T El Ed Speech Language	1	0	1
		SEM-T Sec Ed Cognitive Impair	1	5	6
		SEM-T Sec Ed Emotional Impair	3	1	4
		SEM-T Sec Ed Speech Language	0	1	1
		Sp Ed Admin & Supervision	3	31	34
		Special Education	2	7	9
		Speech & Language Pathology	68	23	91
	Teacher Education	Curriculum & Instruction	1	28	29
		Early Childhood Education	1	35	36
		Educational Media & Technology	1	10	11
		Educational Psychology	0	35	35
		Educational Studies	4	37	41
		Learning Technology & Design	0	2	2

College	Department	Major	Full-time	Part-time	Grand Total
ED (continued)	Teacher Education	Prof Cert Elementary Ed	0	2	2
		Reading	2	20	22
		Secdry Tching - Bio Conc	0	1	1
		Secdry Tching - Chem Conc	0	1	1
		Secdry Tching - Engl Conc	13	1	14
		Secdry Tching - Int Sci Conc	2	1	3
		Secdry Tching - Math Conc	2	4	6
		Secdry Tching - Physics Conc	1	0	1
		Secndry Comm Taught World Lang	1	2	3
		Social Foundations	2	10	12
		Teacher Certification Renewal	0	3	3
		Teacher Endorsement	1	5	6
		Urban/Diversity Education	0	1	1
ED Total			**197**	**643**	**840**
HH	School of Health Sciences	Clinical Research Admin	6	18	24
		Combined OT (BS/MOT)	19	2	21
		Dementia	0	2	2
		Dietetics	24	1	25
		Gerontology	0	1	1
		Health Administration	7	27	34
		Health Informatics	0	1	1
		Human Nutrition	5	34	39
		Occupational Therapy	33	1	34
	School of Hlth Prom/Human Perf	Athletic Training	1	0	1
		Combined Athl Trng (BS/MATR)	2	0	2
		Exercise Physiology	13	11	24
		Health Education	3	10	13
		Orthotics/Prosthetics	44	0	44
		Physician Assistant Studies	60	0	60
		Sport Management	14	18	32
	School of Nursing	Adlt Gert Prim Nur PostMasters	1	0	1
		Adlt-Gert Clin Nurs - Post BSN	2	5	7
		Adlt-Gert Primary Nur Post-BSN	11	25	36
		Clinical Research Nursing	0	1	1
		Health Care Systems Teaching	0	1	1
		Nursing Education	0	7	7
	School of Social Work	Family & Children's Services	8	91	99
		Mental Health & Chemical Dep	6	72	78
		Services to the Aging	0	16	16
HH Total			**259**	**344**	**603**
TC	Coll of Technology Interdisc	Technology Doctorate	7	29	36
	Engineering Tech, School of	Computer Aided Engineering	10	6	16
		Engineering Management	20	72	92
		Polymers and Coatings Technlgy	1	26	27
		Project Leadership	0	1	1
		Quality	0	2	2
		Quality Management	2	34	36
	Tech & Prof ServMgt,School of	Technology Studies	8	50	58
	Visual&Built Envmt, School of	Apparel, Textile Merchandising	2	3	5
		Construction Management	11	9	20
		Interior Design	7	2	9
TC Total			**68**	**234**	**302**