

# Program Review

## **Facility Management Certificate & Facility Planning Management Minor Facility Operations Management Minor**

Ferris State University  
College of Engineering Technology  
School of Built Environment  
Architecture and Facility Management

Submitted August 15, 2014

## **Background Information**

### **Minors / Certificates Awarded:**

Facility Planning Management Minor  
Facility Operations Management Minor  
Facility Management Certificate

### **Degrees awarded but not part of this APR report include:**

Associate of Applied Science in Architectural Technology  
Bachelor of Science in Facility Management  
Bachelor of Science in Architecture and Sustainability

### **Program Review Panel:**

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### **Individual With Special Interest to Program:**

NA

### **Faculty Member Outside the College of Engineering Technology:**

NA

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## **Program Name and History**

The Architecture and Facility Management Department (ATFM) offers three educational programs that prepare and meet the needs of various individuals who plan to or currently deal with facilities and the facility management profession. They are:

1. Bachelor of Science in Facility Management (FM)
2. Facility Management Certificate
3. Facility Planning Management Minor and Facility Operations Management Minor

The focus of this review is on the **Certificate and Minors**; however references will be made to the BS in Facility Management as it serves as the spirit and foundation for the Certificate program and Minors; and all courses within the Certificate and Minors are part of the BS in FM degree program. Furthermore, it was suggested that this review not follow the APR Guide and Outline precisely, but rather capture sufficient and relevant information for an effective review by the APRC.

### **Bachelor of Science in Facility Management (FM)**

The BS program, launched in 1989, was designed as a unique baccalaureate degree option for graduates of Ferris and community college Associate Degree Programs in Architectural Technology. During the 1980's Facility Management was an emerging, growing profession, and virtually no FM related educational programs existed at that time. Ferris' Architectural Technology program seized the opportunity to be one of the first national baccalaureate programs (along with Colorado State University and Brigham Young University).

In addition to being one of the first national universities to create a BS in FM it should be noted that Ferris State is among the original academic programs recognized and accredited by the International Facility Management Association (IFMA) Foundation. There are currently nine accredited baccalaureate level facility management programs in North America and sixteen in the world.

Furthermore, several Ferris faculty have been instrumental in the evolution of the Accreditation Standard used to accredit programs. The program was initially accredited in 1996 and successfully reaccredited in 2002 and 2008. The BS program is currently being accredited with an IFMA Site Visit scheduled for October 2014; of which the report has been sent to the APR committee as a separate document.

Ferris' accredited baccalaureate program in FM provides education in the eleven core competencies identified by IFMA. All competencies must be addressed, at least to an awareness level, in accredited baccalaureate degrees in facility management. The current competencies are:

- Leadership and Management
- Operations and Maintenance

- Project Management
- Communication
- Finance and Business
- Human Factors
- Quality
- Real Estate and Property Management
- Technology
- Emergency Preparedness and Business Continuity
- Environmental Stewardship and Sustainability

It should be noted that the FM program is the second half of a 2+2 degree, the first being the AAS in Architectural Technology. The educational philosophy of the FM program is to provide a core of general education, business and management, architectural and building technology, and facility management coursework to provide graduates with the skills, knowledge, and abilities for employment in the growing field of facility management.

### **Facility Management Certificate**

To address the growing interest and demand for FM education for individuals already employed in an FM related profession, a **Facility Management Certificate** was launched and offered at the Applied Technology Center (ATC) in Grand Rapids in 1992. The program originally included the following five classes:

- FMAN 321 – Principles of Facility Management
- FMAN 322 – Project Management
- FMAN 331 – Facility Programming and the Design Process
- FMAN 441 – Property Development and Planning
- FMAN 451 – Planning and Budgeting for Operations

For 10 years the FM Certificate program flourished with successful enrollment and graduation rates at the ATC. One to two classes were offered each term or semester in the late afternoon or evening to accommodate the non-traditional, working adult student. However, over time the program had saturated the west Michigan market and its potential for steady or increased enrollment was declining. In 2003 the decision was made, in part due to the saturated west Michigan market and in part due to the growing regional and national interest in FM education, to discontinue the offering of the Certificate at the ATC and move the program Online. At that time the Certificate program was reduced from five to four classes with the elimination of FMAN 441 –Property Development and Planning. This curriculum change was made for the following reasons: 1) teaching loads at the time were such that it would place an overload burden on faculty, and 2) to allow students to complete the certificate in one year or less.

Currently the program consists of the following four classes:

- FMAN 321 – Principles of Facility Management
- FMAN 322 – Project Management
- FMAN 331 – Facility Programming and the Design Process
- FMAN 451 – Planning and Budgeting for Operations

Each is a 3-credit hour, full semester course. It typically takes a student 3 to 4 semesters to complete the certificate. This includes the 14-week summer semester session.

The following table maps the competencies and the depth to which each is addressed in each of the courses in the certificate. The darker the shade, the more in depth the competency is addressed.

IFMA Competency	FMAN 321	FMAN 322	FMAN 331	FMAN 451
Leadership and Management				
Operations and Maintenance				
Project Management				
Communication				
Human Factors				
Quality				
Environmental Stewardship and Sustainability				

### **Facility Management Minors**

In 2006 two Facility Management Minors: **Facility Planning Management Minor** and **Facility Operations Management Minor** were created to provide options and an additional skill set for students enrolled in other BS or higher level degrees at Ferris. The Minor options help prepare non-technically oriented students to effectively participate in the facility planning & facility operation processes where they may be employed and may be required to manage a facility.

The Minors are most appropriate for students pursuing baccalaureate degrees in: Architecture & Sustainability, Construction Management, Hotel Management, HVACR, Music Industry Management, Resort Management, Recreation and Leisure Management, and Allied Health programs.

At this time the IFMA Foundation does not accredit Certificates or Minors. However, all courses within the Certificate and Minors employ courses from the accredited BS program; as such the coursework provides Certificate and Minor graduates with the skills, knowledge, and abilities for employment in the field of facility management consistent with IFMA’s core competencies.

In particular the following seven of eleven competencies, as noted previously, are covered in either the Certificate or Minors:

- Leadership and Management
- Operations and Maintenance
- Project Management
- Communication
- Human Factors
- Quality
- Environmental Stewardship and Sustainability

## **Program Mission**

### **Ferris State University – Mission Statement**

Ferris State University prepares students for successful careers, responsible citizenship, and lifelong learning. Through its many partnerships and its career-oriented, broad-based education, Ferris serves our rapidly changing global economy and society.

### **College of Engineering Technology – Mission Statement**

Our mission is to prepare graduates who have met the high academic standards of our programs for current and future industrial and business needs of the state, the nation and the global market.

### **BS in Facility Management – Mission Statement**

The mission of the Bachelor of Science in Facility Management degree program is to be a nationally recognized program that provides students with a foundation of concepts, skills and values to effectively begin the practice of facility management and instill the value of life-long learning.

The FM Certificate and the FM Minors do not have stand-alone mission statements; as such they incorporate and follow the BS in FM mission statement. In essence, the career-oriented Certificate and Minors incorporate and align with the FSU mission and the CET mission by contributing to the workforce needs of Michigan (and beyond) and by preparing students to be lifelong learners in a rapidly changing and diverse world. All decisions regarding curriculum are rooted in providing career-oriented education that fulfills the needs of the facility management profession, and guarantees graduate success.

In order to help each student maximize his or her potential, acquire FM skills, and develop an ethic of responsibility for the social and environmental well-being of our built environment, the FM mission statement is highlighted at student receptions, reviewed in FMAN courses, and communicated through informal exchanges with students. In particular the mission is emphasized as students prepare for the summer internship course (FMAN 393).

The FM mission statement is reviewed for relevancy every three years by the faculty and FM Advisory Board to assure alignment with Ferris' mission statement and the program's vision. Additionally, the mission statement is reviewed every six years during the IFMA accreditation review and report.

All three program areas specifically align with the following Ferris Core Values:

- **Learning:** Ferris State University values education that is career-oriented, balances theory and practice, develops critical thinking, emphasizes active learning, and fosters responsibility and the desire for the lifelong pursuit of knowledge.



- **Opportunity:** Ferris, with a focus on developing career skills and knowledge, provides opportunities for civic engagement, leadership development, advancement, and success.

Additionally the programs are aligned with the following Ferris Vision Statement:

- The preferred choice for students who seek specialized, innovative, career- and life-enhancing education.

## Program Goals

There are three specific goals for the **Facility Management Certificate**.

1. To provide working adults the opportunity to increase their skill sets and basic understanding of FM for immediate use within their current work or for transition into a new career and profession. Typically, individuals with job titles and responsibilities such as facility manager, building manager/supervisor, building owner, facility planner and support staff, architect, architectural technician, designer, furniture industry designer, and facility management services consultant, enroll in the program and benefit from these courses. These students find the course content to be directly applicable to their careers and meet the needs of their employers.
2. To prepare the non-traditional student to sit for the Certified Facility Management exam and earn the credential of Certified Facility Manager (CFM). This credential sets the industry standard for ensuring professional excellence and recognition.
3. To provide courses that qualify for the IFMA CFM maintenance points. CFM's must demonstrate a continued commitment to growth and excellence by earning a required number of maintenance points in at least two of the following four categories: continuing education, practice, professional involvement, or development of the profession.

The overall goal of the **Facility Management Minors** is to provide Ferris students, who are pursuing baccalaureate level degrees, the opportunity to increase their skill sets for future employment and basic understanding of FM in preparation for careers that may involve the management, design or planning of facilities.

Program goals are communicated through the program web site and brochures, through course student learning outcomes, through course introductions and discussion with students.

Program goals are reviewed each year in preparation for and during the annual FM Advisory Meeting, and every six years in preparation for the IFMA accreditation review and report. In the Certificate and Minor program areas the program has achieved success by addressing seven of the eleven core IFMA competencies. These include:

- Leadership and Management

- Operations and Maintenance
- Project Management
- Communication
- Human Factors
- Quality
- Environmental Stewardship and Sustainability

## Curriculum

### Curriculum Check Sheet Information:

Facility Management Certificate Check Sheet (see Appendix A and link below)

<http://catalog.ferris.edu/programs/338/>

Facility Planning Management Minor Check Sheet (see Appendix A and link below)

<http://catalog.ferris.edu/programs/424/>

Facility Operations Management Minor Check sheet (see Appendix A and link below)

<http://catalog.ferris.edu/programs/425/>

**Course Outlines:** See Appendix B

Program requirements for the **FM Certificate** regarding admission, class sequencing and graduation requirements are communicated during the initial contact with the Program Coordinator (PC). At that time a one-year academic curriculum plan is created. Prior to Early Registration the PC reviews each student's progress toward completion of the plan, and contacts each student via email reminding them to enroll in the next scheduled class.

Curriculum and program requirements for the two **FM Minors** regarding admission, class sequencing and graduation requirements are communicated during the initial meeting with the Program Coordinator. At that time an academic curriculum plan, in conjunction with the student's major courses, is created. Typically these plans range from two to three years. Prior to Early Registration the Program Coordinator reviews each student's progress toward completion of the plan, and contacts each student via email reminding them to enroll in the next scheduled class.

In 2012 the Facility Planning Management Minor was altered to include a set of four required courses and a set of four elective courses from which the students would select two courses. The rationale for this change was due to the fact that three of the six required courses (ARCH 112, ARCH 115, and FMAN 322) were part of the Architecture & Sustainability (ARST) major; as such this minor in its original format (of 6 required courses) had 3 courses that overlapped the major. This exceeded the allowable number of "overlap" courses preventing the ARST students from obtaining this minor. The change provided students pursuing the BS in ARST degree the opportunity to complement their primary program with a Minor in Facility Planning and acquire

a recognizable level of knowledge and proficiency in facility management. Earning of this minor enhances their job readiness and career potential with a highly sought after skill.

In addition, the ability to choose 2 courses from a list of 4 courses allowed students, from a broader range of BS programs, to tailor the curriculum to their interests while still fulfilling the Minor graduation requirements. Since this change took effect, a more diverse group of students has expressed interest in and enrolled in the Facility Planning Management Minor. This includes more business students and integrative studies students. Additionally students can attain the minor in an easier fashion as it helps minimize scheduling conflicts.

No curricular changes are currently under consideration for either the Certificate or Minors.

## **Assessment of Student Learning**

The process for creating, measuring and monitoring program-level student learning outcomes occurs in conjunction with bi-annual collection, review, and entry of TracDat information for FMAN related courses. Refer to Appendix B for Course Student Learning Outcomes.

Moreover, ongoing assessment of both employer and student needs occurs through yearly advisory board meetings, student surveys, and small focus group student meetings conducted by the program coordinator. Comments and concerns expressed by these groups are annually reviewed by faculty and changes are implemented if appropriate.

As previously stated the mission of the Certificate and Minors is to be a nationally recognized program that provides students with a foundation of concepts, skills and values to effectively begin the practice of facility management. The program also seeks to instill the value of life-long learning.

Assessment that measures the fulfillment of this mission includes:

- Student demonstration of critical thinking skills partnered with vocational readiness.
- Student demonstration of awareness, knowledge and/or competency in course specific skills and content.
- Course outlines are designed to address and weigh content in terms of awareness, knowledge and/or competency based on the core competencies developed by IFMA (International Facility Management Association).
- The ability of students to successfully find employment and/or continue their education.

## Program Profile

### **FM Certificate: Introduction**

The majority of **FM Certificate** students are “non-traditional” students. Most are working adults who desire to enhance their understanding of facility management, are seeking a job or career promotion, or are changing careers. FM Certificate students are attending part time and are completing the FM coursework online. Interest in the FM Certificate by students majoring in the BS in HVACR has increased during the last few years. The BS in HVACR is an online curriculum and the online FM Certificate allows them to complete an additional credential to enhance their employability and complement their baccalaureate degree.

### **FM Certificate: Apps, Admits, and Enrolled**

**Table 1:**

**Enrollment Information – FM Certificate (off-campus)** *(Source: Institutional Research and Testing)*

<b>Year</b>	<b>Applicants</b>	<b>Admits</b>	<b>Enrolled</b>
2009	NA	NA	11
2010	NA	NA	16
2011	NA	NA	11
2012	NA	NA	7
2013	NA	NA	6
<b>2009-2013</b>			<b>51</b>

**Table 2:**

**Enrollment Information – FM Certificate (off-campus)** *(Source: ATFM program data)*

<b>Year</b>	<b>Applicants</b>	<b>Admits</b>	<b>Enrolled</b>
2009	NA	NA	23
2010	NA	30	25
2011	NA	20	17
2012	NA	18	14
2013	NA	21	18
<b>2009-2013</b>			<b>97</b>

The above tables indicate a discrepancy between IR & T data and ATFM enrollment data. Because many students begin the program during the summer semester, ATFM program data is collected for and includes summer + fall + spring semesters. Historically the program has a high number of students that begin the program, complete one or two courses, but are not able to complete the 4 course program due to family or work demands and obligations. It should also be noted that it is common for many students to take a semester or two off and then re-apply and ultimately complete the program.

The decline in enrollment numbers since 2011 is primarily due to the elimination of educational programs of corporations and organizations. In general, many of our certificate students rely on a tuition-compensation program that is provided by their employer. With the downturn in the economy a noticeable decrease in support by employers has occurred and impacted enrollment. Also the initial marketing efforts of the College of Professional Studies (Ferris Statewide and Online) have decreased over the years. During recruitment visits and meetings, we focus on and promote the cost / benefit aspect to prospects and applicants in an effort to maintain and increase enrollment. Some recognize that the long-term benefits outweigh the short-term cost of tuition.

**FM Certificate: Enrollment – Headcounts** *(Source: Institutional Research and Testing)*

Year		On-Campus	On-line	Total
2009	Freshman		7	7
	Sophomore		1	1
	Junior		1	1
	Senior	1	1	2
				<b>11</b>
2010	Freshman		10	10
	Sophomore		2	2
	Junior		1	1
	Senior	1	2	3
				<b>16</b>
2011	Freshman		4	4
	Sophomore		2	2
	Junior		2	2
	Senior		2	2
				<b>*10</b>
2012	Freshman		3	3
	Sophomore		0	0
	Junior		4	0
	Senior		0	4
				<b>7</b>
2013	Freshman		3	3
	Sophomore		0	1
	Junior		1	2
	Senior		2	0
				<b>6</b>

\*Note: Total enrollment number does not match Table 1 under **Apps, Admits, and Enrolled** section nor Table 2.

Given the number of faculty and the delivery of the certificate as an on-line program, faculty believe that the ideal number for online instruction and evaluation is 16-18 students per class. Per program data, the program is at, and in some years, has exceeded capacity.

**FM Certificate: Student Credit Hour Trends** *(Source: Institutional Research and Testing)*

Year		On-Campus	On-line	Total
2009	Freshman		21	21
	Sophomore		3	3
	Junior		3	3
	Senior	3	3	6
				<b>33</b>
2010	Freshman		30	30
	Sophomore		6	6
	Junior		3	3
	Senior	3	6	9
				<b>48</b>
2011	Freshman		12	12
	Sophomore		6	6
	Junior		6	6
	Senior		6	6
				<b>30</b>
2012	Freshman		9	9
	Sophomore		0	0
	Junior		0	0
	Senior		12	12
				<b>21</b>
2013	Freshman		15	15
	Sophomore		0	0
	Junior		9	9
	Senior		6	6
			0	<b>30</b>

**FM Certificate: Productivity**

Not Available

**FM Certificate: Residency** (Source: Institutional Research and Testing)

Year	Residency		Ave. Age	FSU GPA	Ave. ACT
	Resident	Non-Resident			
2009	11	0	41	3.44	20
2010	16	0	41	3.28	23
2011	11	0	41	3.24	23
2012	7	0	45	3.39	13
2013	6	0	44	3.29	-

**FM Certificate: Gender** (Source: Institutional Research and Testing)

Year	Enrolled	Enrolled	Male	Female
	(IR & T data)	(ATFM data)	(IR & T data)	(IR & T data)
2009	11	23	9	2
2010	16	25	13	3
2011	11	17	8	3
2012	7	14	6	1
2013	6	18	6	0

**Note:** IR & T data does not match ATFM program data. For example during the academic year of 2013/2014 four females were enrolled in FMAN certificate classes; one completed and received her Certificate diploma in May of 2014.

**FM Certificate: Ethnicity** (Source: Institutional Research and Testing)

Year	Unknown	Black	Hispanic	Native	Asian	White	Multi	Foreign
2009	2	2	0	0	0	7	0	0
2010	2	1	0	0	0	13	0	0
2011	1	2	1	0	1	6	0	0
2012	1	0	0	0	0	5	1	0
2013	0	0	0	0	0	6	0	0

**FM Certificate: Full/Part Time** (Source: Institutional Research and Testing)

Year	Enrolled	Full Time	Part Time
	(IR & T data)		
2009	11	0	11
2010	16	0	16
2011	11	0	11
2012	7	0	7
2013	6	0	6

**FM Certificate: Retention**

Year	Admits	Enrolled	Program Capacity	Retention
2009		?	25	
2010	30	25	25	15
2011	20	17	25	11
2012	18	14	25	9
2013	21	18	25	13

As mentioned above, historically the program has a high number of students that begin the program, complete one or two courses, but are not able to complete the 4 course program due to family or work demands and obligations. Trends are such that many students take a semester or two off and then re-apply and re-enroll to ultimately complete the program. For example, several students who began the program in the past few years are slowly progressing to completion. As such, the retention numbers indicated above change each year. As students graduate this number is adjusted in order to monitor completion / graduation rates.

Email reminders are sent each semester prior to and during early registration to encourage students to complete the program. Additionally, the Program Coordinator reminds and guides students through the re-application process to assure program re-enrollment.

**FM Certificate: Graduates**

Year	On-campus	On-Line	Total
2009	4	5	9
2010	0	4	4
2011	0	6	6
2012	2	8	10
2013	1	8	9

**FM Minors: Introduction**

The majority of **FM Minor** students would be considered “traditional” students: students who come to Ferris directly from a Michigan high school and are pursuing a baccalaureate degree. The majority of FM Minor students are full time students, and are completing the FM coursework on the Big Rapids campus.

**FM Minors: Apps, Admits, and Enrolled**

Institutional Research and Testing does not compile data for Minors. As such the following information has been collected and compiled by the ATFM program.



**Enrollment Information – FM Minors (on-campus)** (Source: ATFM program data)

Semester	Admits	Enrolled	Average GPA
2009			
2010	5	3	3.71
2011	3	2	3.14
2012	11	9	3.20
2013	18	16	3.25

Overall, the program has shown steady growth in total enrollment over the past five years.

**Gender Information – FM Minors** (Source: ATFM program data)

Semester	Total Enrolled	Male	Female	Average Age
2009				
2010	3	3 (100%)	0 (0%)	20
2011	2	0 (0%)	2 (100%)	19
2012	9	7 (77%)	2 (23%)	19
2013	16	14 (88%)	2 (12%)	19

## **Program Value beyond Productivity and Enrollment Numbers**

The most positive impact the program has on the School and College, beyond hard numbers, is the national publicity and recognition of all 3 program areas among the FM profession. By providing three FM degrees that meet the needs of traditional students, students in allied degrees and professions, and working adults we place more “Ferris People” in more professional environments.

A value of both the Certificate and Minor are that they help students understand their profession in a more comprehensive manner. For example, architectural and construction management students understand architecture from a client’s perspective. HVACR students understand HVACR from a management perspective and also learn to view HVACR as a system within a larger building, instead of a separate entity of its own. Students from a business program learn to appreciate the complexity of buildings and the need to manage and maintain building in a sustainable fashion.

Because the BS degree is accredited by the IFMA Foundation, the IFMA Foundation lists Ferris State on their web site, as having an accredited program and provides contact information. As such, many prospective out-of-state students who cannot come to Ferris express an interest in and attend the online Certificate.

## **Program Flexibility and Access**

As an Online program the **FM Certificate** naturally offers accessibility to a worldwide audience of potential students. The program is flexible in that coursework is completed at the student's convenience and links professional faculty and students from around the country and world. Due to a high desire of certificate students to complete the certificate in a timely manner, one or two courses are offered fall, spring and summer semesters allowing students to complete the program in three semesters. Students are encouraged to begin the program with the introductory course (FMAN 321) which is offered in the spring or summer semester. However, depending on the student's resume, exceptions are made and many students begin the program without the introductory course.

**FM Minor** students are generally traditional full-time students who are prepared to complete their coursework on the Big Rapids campus as full-time students. Advising is a critical part of ensuring access to the courses necessary for timely graduation. Each student is assigned an FM advisor and careful attention is given to help students plan a strategy to meet entry requirements, schedule prerequisite courses, and meet other minor requirements in conjunction with major requirements.

All courses within the FM Minors are offered during the day and are delivered face to face; however, if conflicts occur with major courses students have the option of taking the FMAN course online via the Certificate program.

All courses are enhanced via FerrisConnect. This allows faculty to provide students with lectures, study guides, assignments, and other enhancements that improve the quality of the course and use time and resources more efficiently.

## **Visibility and Distinctiveness**

The pioneering FM curriculum at Ferris has a proud record of providing relevant, professional facility management education. In particular the BS and Certificate programs are recognized among professionals, professional associations, corporations, and academic institutions as producing qualified and employable graduates with respected technical and managerial skills. As such, students enter the program knowing they will obtain a valued education and will enjoy successful careers in facility management or other professions of the built environment.

As previously outlined, Ferris offers three educational programs in Facility Management designed to meet the needs of traditional and non-traditional students who plan to manage facilities or currently do so. All three utilize courses that comprise the baccalaureate degree program. They are:

- Bachelor of Science Degree in Facility Management. The degree accredited by the IFMA Foundation.
- Certificate Degree in Facility Management. The FM Certificate is designed for non-traditional students who are currently working or have worked in facility management or a related area. It is ideal for tradespersons who wish to move to a management position, persons who have facility management responsibilities with minimal facility related training, etc. The courses offered in the certificate are fully online.
- Minor in Facility Management. These minors are designed for students in other majors at Ferris. While any major is acceptable, the degree was intended for students who plan to have some responsibility for facilities such as Construction Management, HVACR, Recreation and Leadership, Hospitality Management, Architecture and Sustainability, etc.

While the Certificate and Minors address an educational need and attract new students to Ferris, they also benefit the program and the university by improving program productivity.

While many facility management programs have been offered at various institutions, few have endured and achieved success. The success of Ferris' curriculum can to some extent be credited to the process by which it was conceived and implemented. The International Facility Management Association (IFMA) developed and periodically redefines areas of competency for facility managers. Ferris' curriculum is based on these competency areas and regularly modifies to address changes identified by the faculty, advisory board members, and other facility management professionals. Thus, the curriculum is not based solely on theory, but has also evolved from the benefit of practice.

## Demand

Student interviews and advising meetings indicate that students choose the **Certificate** or **FM Minors** because of the program's reputation, technical emphasis, and focus on facilities. Over the last five years, the interest and enrollment in FM Minors has grown significantly, due in part to the high placement rate of our BS in FM graduates.

The FM Minors are also useful for transfer students who find that they have holes in their schedules and desire to take relevant built environment courses that complement their major. Graduates who hold the BS in HVACR and the Facility Operations Minor are highly sought after due to a high demand for energy management skills and an understanding of sustainability in facilities. Graduates who hold the BS in Architecture and Sustainability and the Facility Planning Minor afford more job and career opportunities with the additional skill set.

*While job growth is expected to be about 12 percent, about as fast as average, from 2008-2018 for Administrative Services Managers, demand for Facility Managers is expected to be higher. Applicants for higher level management jobs will have strong competition, while less competition is expected for lower level management jobs.*

*While continued downsizing by companies and the increased use of technology may result in a more streamlined management structure with fewer levels of management, demand for facility managers should remain strong. This is due to businesses increasingly realizing the importance of maintaining, securing, and effectively operating their facilities. Cost cutting measures to improve profitability and compete globally will continue in many organizations, resulting in more outsourcing of facility management services, or in hiring qualified facility managers who are capable of achieving these goals in house.*

*Consulting opportunities should grow as companies look to outsource administrative and specialized tasks such as food services, janitorial services, space planning and design, energy management, telecommunications, information technology, energy conservation, and grounds and equipment maintenance and repair.*

Labor Market Demand Source: US Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook, 2014 Edition. <http://www.bls.gov/oco/>

In general, job prospects should be better for those who can manage a wide range of responsibilities, than for those who specialize in particular functions. In addition to job opportunities resulting from growth, many job openings will stem from the need to replace workers who transfer to other jobs, retire, or otherwise leave the occupation. Note: The General Services Administration, US State Department, and Public Works Canada have all expressed concern over retiring baby boomers with few mid-career replacements.

## Faculty Composition and Engagement

There are seven FTE positions (five tenured faculty and two FTE tenure-track faculty), and one adjunct teaching within the ATFM program area. Additional SBE faculty teach program required courses as follows: one Construction Management faculty member teaches ARCH 223 and ARCH 323 (see teaching load table below), and two HVAC faculty members teach HVAC 337 and HVAC 483.

The seven ATFM FTE faculty, along with one adjunct, and the other additional SBE faculty adequately serve our program needs and structure.

<b>Distribution of Teaching Loads</b>			
<b>Faculty</b>	<b>% in BS FM (on-campus)</b>	<b>% FM Certificate (online)</b>	<b>% Architecture (on-campus)</b>
<b>Tenured Faculty</b>			
Mary Brayton	12.5%	0%	87.5%
Gary Gerber	12.5%	0%	87.5%
Dane Johnson	12.5%	25% summer	87.5%
Diane Nagelkirk	12.5%	12.5% 33% summer	75%
Joe Samson	54.2%	37.5% 33% summer	8.3%
<b>Tenure-track Faculty</b>			
Chris Cospers	0%	0%	100%
Paul Long	0%	0%	100%
<b>Adjunct</b>			
Lauren Liebler	0%	0%	25%
<b>TOTALS</b>			
	104.2%	141%	570.8%

<b>Faculty Teaching Loads - Academic Year 2013 - 2014</b>									
<b>Faculty</b>	<b>Course</b>	<b>Cr.</b>	<b>Config.</b>	<b>Notes</b>	<b>Course</b>	<b>Cr.</b>	<b>Config.</b>	<b>Notes</b>	<b>Total (24/36)</b>
	<b>Fall Semester</b>				<b>Spring Semester</b>				
<b>Mary Brayton</b>	ARCH 101	3	2+4		ARCH 102	4	2+6		
	ARCH 112	4	3+2		ARCH 115	3	3+0		
	ARCH 112	4	3+2		FMAN 432	3	2+2	FM students	
		<b>11</b>	<b>16</b>			<b>10</b>	<b>15</b>		<b>21/31</b>
<b>Chris Cospers</b>	ARCH 101	3	2+4		ARCH 290	3	2+2		
	ARCH 241	3	2+2		ARCH 362	3	3+0		
	ARCH 361	3	3+0		ARCH 499	5	3+6		
		<b>9</b>	<b>13</b>			<b>11</b>	<b>16</b>		<b>20/29</b>
<b>Gary Gerber</b>	ARCH 203	4	2+6		ARCH 204	4	2+6		
	ARCH 110	2	1+3	HVAC students	ARCH 110	2	1+3	HVAC students	

	ARCH 110	2	1+3	HVAC students	ARCH 250	3	2+2	FM students	
	FMAN 441	3	3+0						
		<b>11</b>	<b>19</b>			<b>9</b>	<b>16</b>		<b>20/35</b>
<b>Dane Johnson</b>	ARCH 241	3	2+2		ARCH 245	3	3+0		
	ARCH 244	3	3+0		ARCH 246	3	3+0		
	FMAN 431	3	3+0		ARCH 342	5	3+6		
	FSUS 100	1	1+0						
		<b>10</b>	<b>12</b>			<b>11</b>	<b>15</b>		<b>21/27</b>
<b>Paul Long</b>	ARCH 203	4	2+6		ARCH 102	4	2+6		
	ARCH 441	5	3+6		ARCH 204	4	2+6		
	KCAD	3	3+0	Release time					
		<b>12</b>	<b>20</b>			<b>8</b>	<b>16</b>		<b>20/36</b>
<b>Diane Nagelkirk</b>	ARCH 341	5	3+6		FMAN 322	3	3+0		
	Pr. Coord.	6	9		FMAN 322	3	3+0	Certificate	
					Pr. Coord.	6	9		
		<b>11</b>	<b>18</b>			<b>12</b>	<b>15</b>		<b>23/33</b>
<b>Joe Samson</b>	FMAN 321	3	3+0		FMAN 331	3	2+2		
	FMAN 451	3	3+0		FMAN 321	3	3+0	Certificate	
	FMAN 451	3	3+0	Certificate	FMAN 499	3	2+2		
	FMAN 489	1	1+0		ARCH 285	3	2+2		
		<b>10</b>	<b>10</b>			<b>12</b>	<b>15</b>		<b>22/25</b>
<b>Adjuncts:</b>									
Lauren Liebler	ARCH 421	3	3+0		FMAN 432	3	2+2	ARST students	
					FMAN 432	3	2+2	ARST students	
		<b>3</b>	<b>3</b>			<b>6</b>	<b>8</b>		<b>9 / 11</b>
Bob Eastley	ARCH 223	3	3+0		ARCH 323	3	3+0		
		<b>3</b>	<b>3</b>			<b>3</b>	<b>3</b>		<b>6 / 6</b>

FTE Faculty:

**Mary E. Brayton, Professor**

**Licensed Architect MI**

AAS Arts, Grand Rapids Community College

AAS Ornamental Horticulture Technology, Ferris State University

BS Architecture, University of Michigan

Master of Architecture, University of Michigan

**Christopher Cosper, AIA, LEED AP, Assistant Professor**

**Licensed Architect MS**

Bachelor of Architecture, Mississippi State University

Master of Arts, English, Mississippi State University

Master of Design Studies, Harvard University

**Gary Gerber, AIA, CSI, CDT, LEED AP, USGBC, Associate Professor  
Licensed Architect MI**

AAS Architectural Technology, Ferris State University  
BS Architecture, University of Michigan  
MBA, Grand Valley State University

**Dane A Johnson, Associate Professor**

**Licensed Architect MI, Certified Historic Architect, US Department of the Interior**

BS Architecture, Lawrence Technological University  
B of Architecture, Lawrence Technological University  
Master of Architecture, Lawrence Technological University  
MS Career and Technical Education, Ferris State University

**Paul W Long, AIA, NCARB, LEED AP, Assistant Professor**

**Licensed Architect CO**

BS Architecture, University of Idaho  
Master of Architecture, University of Idaho  
MS City Design and Social Sciences, London School of Economics

**Diane L Nagelkirk, Professor/Program Coordinator**

**Licensed Architect MI**

BS Architecture, Lawrence Technological University  
B of Architecture, Lawrence Technological University  
Master of Architecture, Lawrence Technological University  
MS Green Building, San Francisco Institute of Architecture (pending August 2015)

**Joe M Samson, CFM, Professor**

**Licensed Architect MI/OH**

**Certified Facility Manager (CFM)**

B of Architecture, Kent State University  
Master of Architecture, Kent State University

Adjunct Faculty:

**Lauren Liebler, LEED AP**

**Licensed Architect MI**

BS Architecture, Lawrence Technological University  
BS Interior Architecture, Lawrence Technological University  
Master of Architecture, Lawrence Technological University

To date all faculty members are licensed architects, with one faculty member also being a Certified Facility Manager. All members have been or are currently practicing architecture and bring a real world perspective to the classroom. All are involved in professional organizations and strive to remain current with the latest technological and practice oriented developments.

In addition to professional expertise, maintaining current and relevant teaching and learning methodologies is valued and demonstrated through participation in continuing education on an annual basis.

The department seeks to hire and nurture individuals who are committed to teaching, dedicated to academia, and able to enhance our vision of providing relevant architectural and facility management education. The minimum qualifications for a tenure-line, full time temporary, or adjunct faculty include: Master of Architecture, 5 years of professional experience, and preferred teaching experience.

## Facilities and Equipment

### Space:

The ATFM program utilizes a variety of class formats: traditional classroom, studio classroom, hand drafting, model building, digital drawing, and informal meeting and group study areas; the program spaces are designed to accommodate the diverse learning activities which they support. The following table presents the characteristics of the spaces assigned to ATFM.

### **Summary of Spaces Assigned to Architecture and Facility Management Program Area**

Space	Cap.	Use	Teaching Equipment	Condition	HVAC	Finishes	Other
Swan 218	36	Lecture	Computer, Projector, Screen, Whiteboard	Good	Heat and AC	Painted CMU walls, lay-in ceiling with dimmable fluorescent lighting, carpet.	
Swan 218 was transferred to the ATFM program in August of 2013 to serve as the dedicated Facility Management Learning lab. While it is still primarily used for FM classes, it is occasionally used for architecture courses as well as other college and university wide courses (English, Surveying, etc).							
Swan 202	32	Lecture	Computer, Projector, Screen, Whiteboard	Good	Heat only	Painted CMU walls, lay-in ceiling with dimmable fluorescent lighting, carpet, single pane operable windows.	Shelves for construction material display, Lecture seating, cabinets with sink.
Swan 202 is used for various lecture classes, but is specifically designed for construction materials courses due to installed models of construction framing systems, storage for construction materials, and adjacency to Swan 202A, a storage room.							
Swan 202A	NA	Storage	NA	Fair	Heat only	Painted CMU walls, lay-in	Shelves for storage of



						ceiling with fluorescent lighting, carpet, single pane operable windows.	construction materials, student work, repair tools, etc.
Swan 202A is a storage area located between Swan 202 and Swan 203.							
Swan 203	20	Lecture & Studio	Computer, Projector, Screen, Whiteboard	Fair	Heat only	Painted CMU and drywall walls, lay-in ceiling with fluorescent lighting, carpet, single pane operable windows.	Lockers, drawing files, cabinets with sink, Lecture seating, hand drafting stations.
Swan 203 is used for classes that feature hand drafting and model building. A lecture area is located near the front of the class, and the drafting stations (drafting tables/reference tables) are located away from the lecture area.							
Swan 205	22	Lecture & Studio	Computer, Projector, Screen, Whiteboard, tack surface.	Good	Heat Window AC Units	Painted CMU and drywall walls, lay- in ceiling with dimmable pendant mounted indirect fluorescent lighting, and recessed dimmable incandescent lighting, single pane operable windows.	Drawing files, Lecture seating, digital drafting stations, cabinets.
Swan 205 was renovated in 2005 as a donation from John Wheeler of Rockford Construction. It is typically used for upper level studios in both Architectural Technology and Facility Management. The combination lecture and studio area is ideal for these courses.							
Swan 208	NA	Printing Plotting	Printer, Plotter	Good	Heat only	Painted CMU and drywall walls, lay-in ceiling with fluorescent lighting, carpet.	Drawing files, recycling bins, shelves.
Swan 208 is shared as a printing and plotting station for all academic computers used by students in the program. It is accessible from Swan 205 and Swan 212.							
Swan 208A	NA	Group Work, Reference	Whiteboard, bookshelves.	Fair	Heat only	Painted CMU and drywall walls, lay-in ceiling with	Lounge seating, tables, bookshelves.

						fluorescent lighting, carpet, single pane operable windows.	
Classes are not scheduled in Swan 208A. It is used as an informal meeting area for students for independent and group study. It also is supplied with some material samples, reference materials, and journals.							
Swan 212	20	Lecture Studio	Computer, Projector, Screen, Whiteboard.	Fair	Heat Window AC Units	Painted CMU and drywall walls, lay in ceiling with dimmable fluorescent lighting, carpet, single pane operable windows.	Drawing files, Lecture seating, digital drafting stations, cabinets with sink.
Swan 212 is used as a digital drafting studio for various courses. The combination lecture and studio area is ideal for these courses.							
Swan 226	18	Junior Studio		Good	Heat only	Painted CMU walls, lay-in ceiling fluorescent lighting, carpet, single pane operable windows.	18 work stations
Swan 225	18	Senior Studio		Poor	Heat only	Painted CMU walls, exposed ceiling, concrete floor, fluorescent lighting, NO windows.	18 work stations
Swan 307	NA	Digital Center	NA	Fair	Heat only	Painted CMU and drywall walls, lay-in ceiling with fluorescent lighting, single pane operable windows.	Plotters, Laser cutter 3D printer
Swan 307 was added to the program area in 2010. It has been outfitted with equipment to be used primarily by students in the upper level Architecture and Sustainability program.							
Swan 313	NA	Model Shop		Fair	Heat only	Painted CMU and drywall walls, lay-in ceiling with fluorescent	

						lighting, carpet, single pane operable windows.	
Swan 314	NA	Program Office		Good	Heat and Window AC Unit	Painted CMU and drywall walls, lay-in ceiling with fluorescent lighting, carpet, single pane operable windows.	

The Architecture and Facility Management Program Mission Statements match Ferris’ mission of preparing students for careers. This endeavor is supported and fulfilled by a quality curriculum and a committed faculty group. The facilities and instructional environment, however, do not enhance learning or match program goals. As professions of the built environment, it is critical that the ATFM programs have physical spaces that are aesthetically and functionally of the highest quality. A program goal is to create an environment that mirrors the environment of a professional office or design studio. Current ATFM spaces do not fulfill this goal.

The faculty believes that the entirety of spaces assigned to the program impact the effectiveness of program efforts and recruitment and retention. This is especially true in a curriculum which focuses on teaching students how to provide clients with spaces that support the mission of their organizations, and spaces that are functional and aesthetically pleasing. Thus, the spaces assigned to the ATFM program area are lacking in the following areas:

1. Poor Spatial Adjacencies: Effective organizations have their spaces arranged in a manner that promotes interaction and communication, as well as creating a “home space” that physically defines that organization.
  - The ATFM program is part of the School of Built Environment (SBE). However, the SBE office and the other two programs (HVAC and CM) are located in the Granger Center, while the ATFM program is located in Swan Building – approximately ¼ mile to the south. Better adjacency with the SBE would enhance cross discipline communication and innovation efforts.
  - The physical area assigned to the ATFM program is physically obsolete and obviously dated in comparison to the Granger Center. This may send a subtle message to students regarding the status of the program.
  - Within the Swan Building, ATFM spaces are located on two different floors; most classrooms are on the second floor located in two separate wings; the program office,

digital center, and model shop room are on the third floor. As such, there is no centralization or home space of the ATFM program.

- Partial program secretarial support is located in the Granger Center.
  - The faculty offices are in Johnson Hall, a building near the Swan Building. In effect, program faculty are not adjacent to program students and teaching spaces, the program coordinator, or other SBE peers who are housed in the Granger Center.
2. Outdated Aesthetics, Finishes and Furnishings: While Swan 205 features comfortable and cohesive furnishings due to the 2005 donation by Rockford Construction, the other spaces feature a less cohesive design. The program has repurposed, repaired, and creatively reused furnishings in these rooms. Thus, most could benefit from a facelift that would also serve to recruit and retain students; since many incoming students indicate that their high school spaces were more up to date, attractive and effective learning environments.
  3. Thermal Comfort: Most teaching spaces do not have air conditioning. It is hot and unpleasant for students to focus and produce detailed work the first few weeks of Fall Semester. In the spaces that do have window air conditioning units, the noise is distracting. Many rooms in the winter time are cold and drafty.

In addition to the above issues that impact learning, other factors that impact student attentiveness and learning are: poor ergonomics, uncomfortable seating, broken equipment, outdated computer hardware, and dreary aesthetics. A program that teaches and stresses design excellence should model this value which it is trying to instill in its students.

### Computers:

Computers for student use are located in Swan 205 and Swan 212. These studios are used for both Architecture and Facility Management classes. When classes are not in session students can work in these rooms on a first come, first served basis. The program also hires student monitors to enable the studios to be open limited evening and weekend hours.

The computers in Swan 212 were purchased in Fall 2010 to replace old computers that were unable to process current software needs. Due to lack of funding from the university or college these computers were purchased with program funds. The computers in Swan 205 are 10 years old. They function adequately. However, with standard computing requirements for architectural software moving from digital drafting to digital modeling, they will be obsolete shortly. There is no replacement process for classroom teaching space or lab spaces. These are done as departmental funds are available or as a case is made to allocate funding for replacement. Hopefully, a better mechanism will be found to replace these computers. The program feels that the university and college should take a leadership role in ensuring that state of the art computers are available to students and faculty.

All junior and seniors are required to purchase their own laptop; this has reduced the demand on computers outside of classes.

Other technical resources include:

- Scanner in Swan 208
- 11x17 black and white printer in Swan 208
- 36" color plotter in Swan 208
- 48" wide color plotter in Swan 307
- Laser cutter (for model making) in Swan 307
- 3D printer (for model making) in Swan 307
- CNC router (for model making) in Swan 313

**Software:**

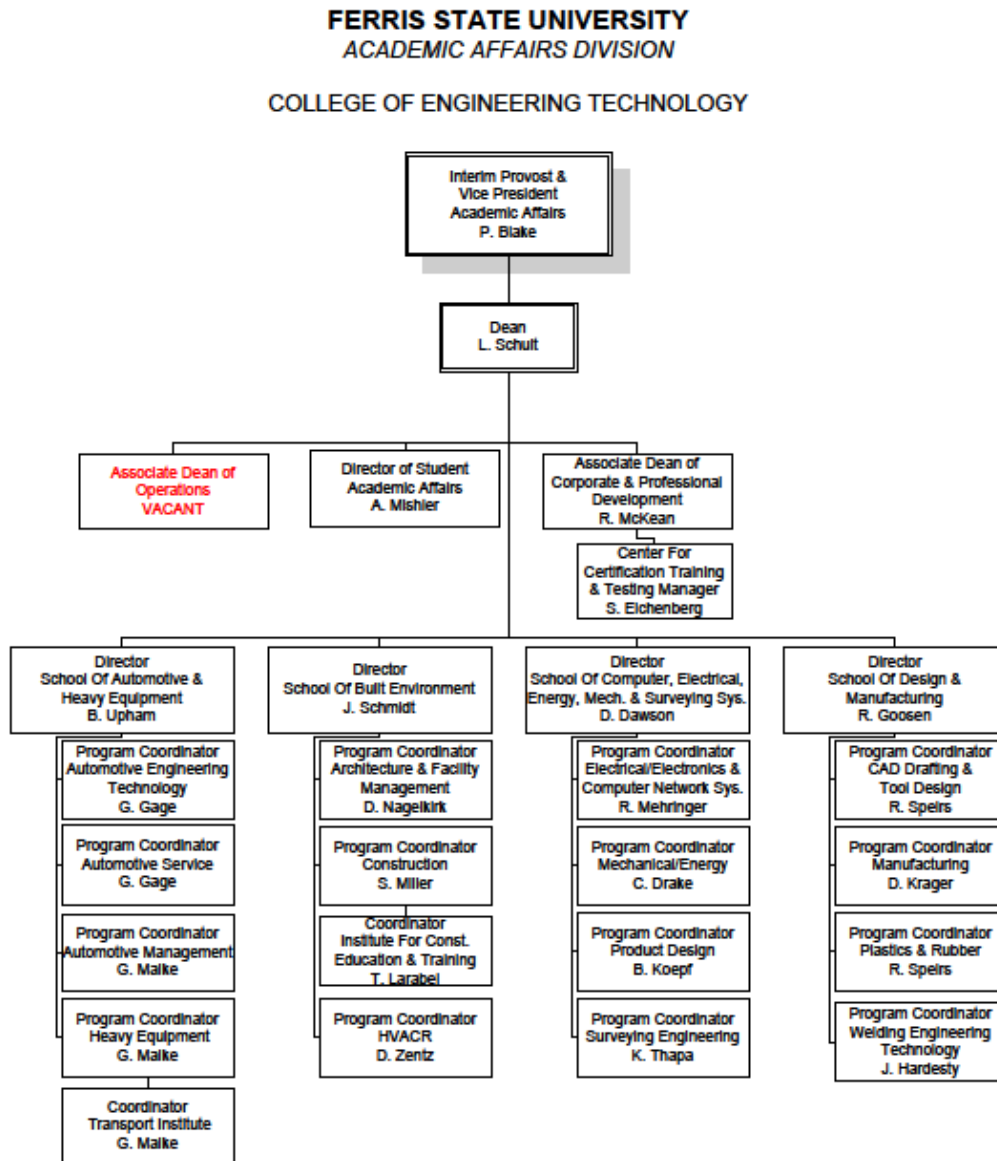
A broad array of software is utilized by the programs.

- Digital drawing software such as AutoCAD, REVIT and SketchUp are used by all programs.
- Increasingly, software, such as PhotoShop and Illustrator, are used to digitally enhance hand and digitally generated drawings.
- Technical software is also utilized to estimate materials, write specifications, and monitor and/or model buildings.
- Courses increasingly use FerrisConnect to enhance the delivery of program material.

Program S&E funds have been used to purchase SketchUp, PhotoShop, and other program specific software. AutoDesk products (AutoCAD and Revit) have traditionally been purchased by the College.

# Program Administration and Support

## CET Organizational Structure



Administrative positions that have program oversight include:

- Mr. Larry Schult, Dean – College of Engineering Technology
- Dr. John Schmidt, Director – School of Built Environment

The faculty of the ATFM program has the following concerns regarding program administration:

- The promised increase in the Supply & Expense budget was not fulfilled with the addition of the new BS in Architecture and Sustainability degree; as such the program area struggles financially to support and effectively manage the three degrees, the minors and the certificate (AAS in Architectural Technology, BS in Architecture and Sustainability, BS in Facility Management, FM Certificate and FM Minors).
- Lack of vision and continuity at the CET Dean's level since 1993 has compromised the effectiveness of the college as a whole, minimizing its ability to react to changes in the various program areas. This has led to:
  - An emphasis on stewardship, rather than a vision, plan, and implementation of change.
  - An emphasis on short term numbers instead of long term viability.
  - The necessity of program areas to "do for themselves" rather than look to the CET for program support. (While this is a good thing in many ways, it also contributes to the weakening and ineffectiveness of the college.)

The faculty of the ATFM program has the following concerns regarding staff support:

- The ATFM program has suffered from a lack of clerical support.
  - From 2003 to 2013, a variety of administrative decisions have resulted in the program enduring 7 different secretaries. The ability to create and maintain continuity and flow of office tasks and program policies and procedures is unmanageable. The constant change results in inefficiency and frustration. Faculty are concerned that this has had a negative impact on both recruitment and retention.
  - Additionally the ATFM program shares a secretary with ICET which results in a half-time office presence.
  - In effect, the Program Coordinator or faculty pick up much of the clerical load, this reduces their focus on academic duties, student needs, recruitment and retention activities.

Despite the above issues and concerns, the program area is run in an effective manner. The Program Coordinator has been proactive in identifying needs of the program and delegating tasks to faculty to ensure timely completion. However, this is a short term fix. On a long term basis, faculty must refocus on academic and teaching issues, updating skills and courses, and advising of students in order to allow the programs to remain relevant and current. While the School structure is still in its implementation, it is believed that the synergies between the program areas, especially in the School of Built Environment will be very beneficial in the future. We are encouraged by the new school Director and the leadership of Dr. John Schmidt and his hard work and commitment to our programs.

## **Appendix A:**

## **Curriculum Check Sheets**



**Ferris State University**  
**College of Engineering Technology**

**ONLINE FACILITY MANAGEMENT CERTIFICATE DEGREE**  
**Curriculum Guide Sheet**  
**Total semester hours: 12**

**Student Name:** \_\_\_\_\_ **Student ID:** \_\_\_\_\_

**Admittance requirements:**

The Online Certificate in Facility Management is a program designed for persons currently working within the profession of Facility Management or a related field who have completed an Associate Degree or have obtained equivalent academic experience.

**Required courses:**

<b>FMAN 321</b>	Principles of Facility Management (enrolled in Cert. program)	_____
<b>FMAN 322</b>	Project Management (co-requisite FMAN 321 or permission)	_____
<b>FMAN 331</b>	Facility Programming and the Design Process (FMAN 321)	_____
<b>FMAN 451</b>	Planning and Budgeting for Operations (FMAN 321)	_____

**Program Objectives:**

1. To broaden the students awareness of the Facility Management profession and facility related issues.
  - a. Instill awareness of how Facility Management activities relate and complement each other; in particular the relationship between the planning/construction and operations/maintenance efforts.
  - b. Expand awareness of Facility Management issues and methods.
  - c. Develop an understanding of the history of Facility Management.
  - d. Develop an understanding of professional organizations and institutions that support the advancement of Facility Management.
2. To develop abilities to plan and manage projects.
3. To develop abilities to program spaces, identify user and organization needs and manage the design process.
4. To develop abilities to effectively maintain a facility, to anticipate and estimate resource requirements and to evaluate and re-engineer facility maintenance and operations practices.

**Ferris State University**  
**College of Engineering Technology**

**Facility Operations Management Minor**  
**Curriculum Guide Sheet**

Total semester hours: 19

Student Name \_\_\_\_\_ Student No. \_\_\_\_\_

**Admittance requirements:**

This Minor is open to all students enrolled at Ferris State University pursuing Baccalaureate or higher degrees in majors other than Facility Management. Students are expected to meet prerequisites for all courses.

Students are required to meet with their FM faculty advisor to plan and track their progress throughout the minor.

**Minor requirements:**

19 semester hours; GPA of 2.0 or higher in minor courses; 50% of credits must be 300+ level and 50% of credits must be completed at FSU.

**Required Courses:**

ARCH 112	Structural Materials, Systems and Codes	4 (3+2)
ARCH 115	Interior and Exterior Finishes and Systems (ARCH 112)	3 (3+0)
FMAN 321	Principles of Facility Management	3 (3+0)
FMAN 322	Project Management (FMAN 321)	3 (3+0)
FMAN 451	Planning and Budgeting for Operations (FMAN 321)	3 (3+0)
HVAC 483	HVACR Building Systems	3 (3+0)

**Suggested Course Sequence:**

<b>FALL SEMESTER (sophomore or junior year)</b>		<b>Credits</b>	<b>Grade</b>
ARCH 112	Structural Materials, Systems and Codes	4 (3+2)	_____
FMAN 321	Principles of Facility Management	3 (3+0)	_____
<b>SPRING SEMESTER (sophomore or junior year)</b>			
ARCH 115	Interior and Exterior Finishes and Systems (ARCH 112)	3 (3+0)	_____
FMAN 322	Project Management (FMAN 321)	3 (3+0)	_____
<b>FALL SEMESTER (junior or senior year)</b>			
FMAN 451	Planning and Budgeting for Operations (FMAN 321)	3 (3+0)	_____
<b>SPRING SEMESTER (junior or senior year)</b>			
HVAC 483	HVACR Building Systems	3 (3+0)	_____

# Facility Planning Management Minor Curriculum Guide Sheet

Total semester hours: 18

Student Name \_\_\_\_\_ Student No. \_\_\_\_\_

**Admittance requirements:**

This Minor is open to all students enrolled at Ferris State University pursuing Baccalaureate or higher degrees in majors other than Facility Management. Students are expected to meet prerequisites for all courses. Students are required to meet with their faculty advisor to plan and track their progress throughout the minor.

**Minor requirements:**

18 semester hours; GPA of 2.0 or higher in minor courses; 50% of credits must be 300+ level and 50% of credits must be completed at FSU. A maximum of 1/3 of the credits may overlap with the student's major.

**Required Courses:** (12 credits)

FMAN 321	Principles of Facility Management	3 (3+0)
FMAN 322	Project Management (FMAN 321)	3 (3+0)
FMAN 331	Facility Programming and the Design Process (FMAN 321)	3 (2+2)
FMAN 441	Property Development and Planning (FMAN 321)	3 (3+0)

**Elective Courses:** (choose 2)

ARCH 112	Structural Materials, Systems and Codes	4 (3+2)
ARCH 115	Interior and Exterior Finishes and Systems (ARCH 112)	3 (3+0)
FMAN 431	Principles of Space Planning	3 (2+2)
FMAN 432	Principles of Interior Architecture (FMAN 431)	3 (2+2)

**Suggested Course Sequence for Architecture & Sustainability students:**

<b>FALL SEMESTER (sophomore or junior year)</b>	<b>Credits</b>	<b>Grade</b>
FMAN 321 Principles of Facility Management	3 (3+0)	_____
FMAN 431 Principles of Space Planning	3 (2+2)	_____
<b>SPRING SEMESTER (sophomore or junior year)</b>		
FMAN 331 Facility Programming and Design Process (FMAN 321)	3 (2+2)	_____
<b>FALL SEMESTER (junior or senior year)</b>		
*FMAN 322 Project Management (FMAN 321)	3 (3+0)	_____
FMAN 441 Property Development and Planning (FMAN 321)	3 (3+0)	_____
<b>SPRING SEMESTER (junior or senior year)</b>		
*FMAN 432 Principles of Interior Architecture (FMAN 431)	3 (2+2)	_____

\* Course is part of BS in Architecture & Sustainability major

**Suggested Course Sequence for Construction Management students or other Ferris students enrolled in appropriate baccalaureate programs:**

<b>FALL SEMESTER (sophomore or junior year)</b>	<b>Credits</b>	<b>Grade</b>
**ARCH 112 Structural Materials, Systems and Codes	4 (3+2)	_____
FMAN 321 Principles of Facility Management	3 (3+0)	_____
<b>SPRING SEMESTER (sophomore or junior year)</b>		
**ARCH 115 Interior and Exterior Finishes and Systems (ARCH 112)	3 (3+0)	_____
FMAN 331 Facility Programming and Design Process (FMAN 321)	3 (2+2)	_____
<b>FALL SEMESTER (junior or senior year)</b>		
FMAN 441 Property Development and Planning (FMAN 321)	3 (3+0)	_____
<b>SPRING SEMESTER (junior or senior year)</b>		
FMAN 322 Project Management (FMAN 321)	3 (3+0)	_____

\*\* Course is part of AAS in Architectural Technology major

## **Appendix B:**

## **Short Course Outlines**

**Ferris State University  
College of Engineering Technology  
School of Built Environment  
Short Course Outline**

**Course Title: ARCH 112 Structural Materials, Systems and Codes**

**Credits:** 4 Hours

**Contacts:** 3 Lecture Hours + 2 Lab Hours

**Course Description:** Survey of properties, characteristics, limitations, selection criteria, and graphic interpretation of concrete, steel, masonry and wood used in foundation, substructure, and superstructure building systems. Includes aesthetic, performance, maintainability, and cost/benefit aspects. Introduces major building codes, material and industry standards, and utilization of manufacturers' catalogs.

**Course Prerequisites:** None

**Student Learning Outcomes**

Students satisfactorily completing this course will:

1. Describe attributes (sustainability, performance, aesthetics, and economics) of building systems and their components, building codes, and material classification systems.
2. Graphically assemble structural building components.
3. Evaluate and apply building codes and material classification systems.
4. Demonstrate effective written and verbal communication skills.

<b>Instructional Unit Description and Time Allocation</b>			
	Unit Description Summary	Lecture Hours	Lab Hours
I.	Introduction to course	1	
II.	Making buildings	4	2
III.	Foundations	5	2
IV.	Concrete Construction	3	2
V.	Site-cast Concrete Framing Systems	2	2
VI.	Pre-cast Concrete Framing Systems	3	2
VII.	Brick Masonry	3	2
VIII.	Stone and Concrete Masonry	2	2
IX.	Masonry load-bearing wall construction	2	2
X.	Steel Frame Construction	4	2
XI.	Light Gauge Steel Frame Construction	3	2
XII.	Wood	3	2
XIII.	Heavy Timber Frame Construction	2	2
XIV.	Wood Light Frame Construction	4	2
XV.	Class Project		4
XVI.	Evaluation	4	
	<b>Subtotals</b>	45	30
	<b>Total Hours</b>	75	

**Ferris State University  
College of Engineering Technology  
School of Built Environment  
Short Course Outline**

**Course Title:       ARCH 115   Interior and Exterior Finishes and Systems**

**Credits:**               3 Hours

**Contacts:**             3 Lecture Hours

**Course Description:**   Survey of properties, characteristics, limitations, selection criteria, and graphic interpretation of common interior and exterior finish materials and systems used in exterior closure, roofing, and interior construction. Includes aesthetic, performance, maintainability, and cost/benefit aspects.

**Course Prerequisites:**   ARCH 112

**Student Learning Outcomes**

Students satisfactorily completing this course will:

1. Describe attributes (sustainability, performance, aesthetics, and economics) of building systems and their components, building codes, and material classification systems.
2. Graphically assemble interior and exterior building components.
3. Evaluate and apply building codes and material classification systems.
4. Demonstrate effective written and verbal communication skills.

<b>Instructional Unit Description and Time Allocation</b>		
	Unit Description Summary	Lecture Hours
I.	Introduction to course	1
II.	Exterior finishes for wood light frame construction	4
III.	Interior finishes for wood light frame construction	4
IV.	Roofing	4
V.	Glass and Glazing	4
VI.	Doors and Windows	3
VII.	Designing Cladding Systems	2
VIII.	Cladding with Masonry and Concrete	2
IX.	Cladding with Metal and Glass	3
X.	Selecting Interior Finishes	3
XI.	Interior Walls and Partitions	3
XII.	Finish Ceilings and Floors	5
XIII.	Class project presentations	3
XIV.	Evaluations	4
	<b>Total Hours</b>	<b>45</b>

**FERRIS STATE UNIVERSITY**  
**COLLEGE OF ENGINEERING TECHNOLOGY**  
**ARCHITECTURE AND FACILITY MANAGEMENT**  
**COURSE OUTLINE: FMAN 321**

Course Title:	Principles of Facility Management
Course Description:	Introduction to basic methods, concepts and procedures of facility planning, programming, budgeting, project management, office productivity measurements, and operations management. Emphasis is placed on the facility management process, terminology and organizational development.
Credit Hours:	3
Contact Hours:	3 + 0
Prerequisite:	Enrollment in a Facility Management program or instructor permission

<b>Student Learning Outcomes:</b>	
Students satisfactorily completing this course will achieve proficiency in:	
1.	Understanding the evolution of Facility Management as a profession and the role of Facility Managers as stewards of the corporate environment.
2.	Understanding the relationships between the various competency areas that define the Facility Management profession.
3.	Understanding the Facility Management Life Cycle from planning through facility disposal.
4.	Developing simple budgets from historic data and anticipated trends and needs.
5.	Evaluating simple bids and proposals for value and compliance with organization expectations.
6.	Identifying needs and developing spatial solutions to meet facility requirements as identified in organization business plan.
7.	Demonstrating effective communication in the following areas: writing, speaking, presentations, and small group interaction.

<b>Units of Instruction:</b>		<b>Time Weight:</b>
		<b>Lecture Hours</b>
I.	Course Introduction	1
II.	Overview of Facility Management	2
III.	Relationship of Facility Management to Corporate Management	2
IV.	Strategic Planning and Financial Management	3
V.	Space Planning	3
VI.	Real Estate Management	2
VII.	Project Management	5
VIII.	Programming and Design Management	5
IX.	Construction Management	2
X.	Operations and Maintenance Management	5
XI.	Indoor Air Quality	1
XII.	Green Buildings/Sustainable FM	1

XIII.	Organization and Management of Facility Management Functions	5
XIV.	Budgeting for Facility Management	4
XV.	Managing Building Technologies and Services	2
XVI.	Evaluation	2
<b>Total Hours:</b>		<b>45</b>



**FERRIS STATE UNIVERSITY  
COLLEGE OF ENGINEERING TECHNOLOGY–  
ARCHITECTURE AND FACILITY MANAGEMENT  
COURSE OUTLINE: FMAN 322**

Course Title:	Project Management
Course Description:	Overview of facility project management concepts and methods. Course topics include: development of project plans and teams, sequencing of activities, development of schedules, estimating of resources, coordinating and monitoring of projects, and relocation and move management.
Credit Hours:	3
Contact Hours:	3 lecture hours + 0
Course Prerequisite:	FMAN 321

<b>Student Learning Outcomes:</b>	
Students satisfactorily completing this course will:	
1.	Explain in professional terms the definitions, objectives and processes of the various life cycle phases of projects.
2.	Create and write project plans that include; project concept initiation, project scope, and project schedule.
3.	Explain in professional terms the definitions, objectives and processes of team development, team leadership and the coordination and monitoring phases of a project.
4.	Explain in professional terms the definitions, objectives and processes of the coordination of construction and relocation projects.
5.	Demonstrate effective communication in the following areas: writing, speaking, presentations, and small group interaction.
6.	Compute and produce project plans using various facility management and project management software.

<b>Units of Instruction:</b>		<b>Time Weight:</b>
		<b>Lecture Hours</b>
I.	Course introduction	1
II.	Project management concepts	3
III.	Management theory	3
IV.	Project management skills	3
V.	Team development and team building	3
VI.	Project planning	3
VII.	Project sequencing	3
VIII.	Planning and acquiring resources	3
IX.	Assessing risk	3
X.	Coordination of consultants	3
XI.	Estimating and budgeting	3

XII.	Purchasing and contract administration	3
XIII.	Controlling and monitoring the project	3
XIV.	Closing the project	1
XV.	Construction and relocation management	3
XVI.	Ethical responsibilities	2
XVII.	Evaluation	2
<b>Total Hours:</b>		<b>45</b>

**FERRIS STATE UNIVERSITY  
COLLEGE OF ENGINEERING TECHNOLOGY  
ARCHITECTURE AND FACILITY MANAGEMENT  
COURSE OUTLINE: FMAN 331**

Course Title: Facility Programming and the Design Process  
 Course Description: Course will enable students to understand the role of the facility manager in working with organizations and the users of space to identify facility related needs and present them to design professionals. Students will also learn the facility manager's role in strategic planning, facilitating the organization's business plan, and working with outside consultants to develop facilities.  
 Credit Hours: 3  
 Contact Hours: 2 lecture hours + 2 studio hours  
 Prerequisite: FMAN 321 or instructor permission

**Student Learning Outcomes:**

Students satisfactorily completing this course will achieve proficiency in:

1. Understanding the purpose of facility programming, how it differs from architectural programming, and its role in enabling the development of successful spaces.
2. Understanding how facility programming supports the organization's business goals.
3. Performing the research and data collection necessary to identify the issues and goals necessary for successful space development.
4. Organizing the facility program into a cohesive and operational design tool.
5. Utilizing the facility and architectural programs to evaluate design options as well as functioning spaces.
6. Demonstrating effective communication in the following areas: writing, speaking, presentations, and small group interaction.

Units of Instruction:		Time Weight:	
		Lecture	Studio
I.	Course Introduction	1	
II.	Facility Management Principles & Relationship to Programming and Design Management	1	
III.	Facility Programming and its Relationship to the Organization's Business Goals	1	
IV.	The Facility Programming Process	1	
V.	Facility Programming Goals	1	2
VI.	Human-Environment Relationships	2	2
VII.	Research Principles	3	2
VIII.	Data Sources	2	2
IX.	Data Collection Methodologies	4	4
X.	Post-Occupancy Evaluation	1	
XI.	Statistics	1	2

XII.	Graphic Methodologies	1	2
XIII.	Writing the Facility Program	2	4
XIV.	Presentation	1	2
XV.	Architectural Programming Process	1	
XVI.	Architectural Programming Goals	1	2
XVII.	Writing the Architectural Program	1	6
XVIII.	Site Selection	1	
XIX.	Evaluation of Site Plan	1	
XX.	Evaluation of Architectural Design	1	
XXI.	Evaluation	2	
<b>Subtotals:</b>		<b>30</b>	<b>30</b>
<b>Total Hours:</b>		<b>60</b>	

**FERRIS STATE UNIVERSITY  
COLLEGE OF ENGINEERING TECHNOLOGY  
ARCHITECTURE AND FACILITY MANAGEMENT  
COURSE OUTLINE: FMAN 431**

Course Title:	Principles of Space Planning
Course Description:	Introduction to space planning concepts; office layouts and furniture systems. Space development and furniture systems will be examined in terms of how they serve the business goals of organizations, including growth and contraction forecasting. The course will include an historical overview of office facilities; development of architectural programs; and teamwork exercises to expose students to multiple roles in the facility development team.
Credit Hours:	3
Contact Hours:	2 lecture hours + 2 studio hours
Course Prerequisite:	Enrollment in program

**Student Learning Outcomes:**

Students satisfactorily completing this course will achieve proficiency in:

1. Describing the history and current trends of the American office environment.
2. Identification of employee working styles.
3. Defining, analyzing and planning office projects using varied methodologies
4. Differentiating between space inventories, space forecasting, adjacencies and programming.
5. Using furniture systems to serve complex functional needs
6. Demonstrating effective communication in the following areas: writing, speaking, presentations, and small group interactions.

Units Of Instruction:		Time Weight:	
		Lecture	Studio
I.	Course Introduction	1	
II.	Review of Facility Management Principles with Regard to Space Planning	1	
III.	Overview of Principles of Space Management	2	
IV.	Review of the history of the American office environment	3	
V.	Understanding Working Styles	2	2
VI.	Planning Methodologies: Definition, Analysis, Interpretation	3	4
VII.	Overview of Space Inventory	2	
VIII.	Overview of Space Forecasting	2	
IX.	Overview of Strategic Planning	2	
X.	Programming	2	4
XI.	Relationship of Space Planning to Design	2	
XII.	Standards	1	
XIII.	Adjacencies / Blocking / Stacking	2	8

XIV.	Furniture Systems	3	
XV.	Presentations		8
XVI.	Field Trips		4
XVII.	Evaluation	2	
<b>Subtotals:</b>		<b>30</b>	<b>30</b>
<b>Total Hours</b>		<b>60</b>	

**FERRIS STATE UNIVERSITY  
COLLEGE OF ENGINEERING TECHNOLOGY  
ARCHITECTURE AND FACILITY MANAGEMENT  
COURSE OUTLINE: FMAN 432**

Course Title: Principles of Interior Architecture  
 Course Description: Overview of the elements of interior design and their application. Students apply the principles of interior design with regard to program requirements, context, environment, ergonomics, code and regulatory issues. The visual effects and physical attributes of various components of the interior space are studied.  
 Credit Hours: 3  
 Contact Hours: 2 lecture hours + 2 studio hours  
 Course Prerequisite: FMAN 431

**Student Learning Outcomes:**

Students satisfactorily completing this course will achieve proficiency in:

1. Understanding the theories, approaches and processes of interior design.
2. Developing solutions and supporting documentation for design problems within the context of interior environments.
3. Identifying and utilizing evaluation criteria in the selection of interior finishes, systems and furniture.
4. Performing research involving materials, furniture and systems utilized in building interiors.
5. Demonstrating effective communication in the following areas: writing, speaking, presentations, and small group interaction.

<b>Units Of Instruction:</b>		<b>Time Weight:</b>	
		<b>Lecture</b>	<b>Studio</b>
I.	Course Introduction	1	
II.	Origins of Interior Design	2	
III.	Basic Theories of Composition	2	2
IV.	Color in Interior Design	2	4
V.	Design as a Process	2	2
VI.	Environmental Concerns, Codes and Regulations of Interior Design	3	2
VII.	Interior Environmental Controls	2	
VIII.	Lighting for Interiors	2	2
IX.	Interior Materials and Components	2	2
X.	Architectural Systems and Interior Finishes	4	8
XI.	Furniture, Furnishings and Equipment	4	8
XII.	Current Trends and Topics	2	
XIII.	Evaluation	2	
<b>Subtotals:</b>		<b>30</b>	<b>30</b>
<b>Total Hours:</b>		<b>60</b>	

**FERRIS STATE UNIVERSITY  
COLLEGE OF ENGINEERING TECHNOLOGY  
ARCHITECTURE AND FACILITY MANAGEMENT  
COURSE OUTLINE: FMAN 441**

Course Title:	Property Development and Planning
Course Description:	Introduction to principles and processes of real estate development. The public sector's role in approving and regulating development will be examined along with the roles and responsibilities of the development team. Leasing practice from the landlord and tenant perspective is examined. Areas of study also include; history of real estate development, market analysis, demographics, zoning, feasibility studies and finance, and development practices and trends.
Contact Hours:	3
Contact Hours:	3 lecture hours + 0
Course Prerequisites:	FMAN 321, BLAW221 or permission

<b>Student Learning Outcomes:</b>	
Students satisfactorily completing this course will achieve proficiency in:	
1.	Understanding the history, processes and practices of real estate development.
2.	Understanding the roles of the development team and the public sector.
3.	Understanding the driving forces of real estate development.
4.	Understanding responsible development and management of natural and built resources.
5.	Demonstrating effective communication in the following areas: writing, speaking, presentations, and small group interaction.

<b>Units Of Instruction:</b>		<b>Time Weight:</b>
		<b>Lecture Hours</b>
I.	Introduction	1.5
II.	Real Estate Development Process	1.5
III.	Land and Demographics	3
IV.	Developers and their Partners	3
V.	History of Real Estate Development in the U.S.	6
VI.	Real Estate Finance	3
VII.	Real Estate Development Concepts	3
VIII.	Planning and Analysis: the public role	3
IX.	Planning and Analysis: the market perspective	3
X.	Development Practices	3
XI.	Real Estate Management	3
XII.	Leasing: landlord and tenant perspective	3
XIII.	Current trends, tools and topics in real estate development	3
XIV.	Presentations	3
XV.	Evaluation	3
<b>Total Hours</b>		<b>45</b>



**FERRIS STATE UNIVERSITY  
COLLEGE OF ENGINEERING TECHNOLOGY  
ARCHITECTURE AND FACILITY MANAGEMENT  
COURSE OUTLINE: FMAN 451**

Course Title: Planning and Budgeting for Operations  
 Course Description: Survey of the operating systems within facilities, and the methodologies used to keep those systems operational. Introduction to concepts such as life cycle costs and building diagnostics will be introduced along with methods for estimating and planning staff and financial resources. Common problems associated with selected systems will also be discussed.  
 3  
 Credit Hours: 3 lecture hours + 0  
 Contact Hours: FMAN 321 or instructor permission  
 Course Prerequisite:

**Student Learning Outcomes:**

Students satisfactorily completing this course will achieve proficiency in:

1. Understanding the impact of operations and maintenance costs on the organization's budget and how efficient and cost effective practices contribute to an organization's success.
2. Identifying common problems associated with building systems through the building diagnostics process and using this analysis as the basis for remedial action.
3. Developing building maintenance schedules and budgets by identifying and scheduling tasks and frequencies and using this information to build a staffing plan and budget.
4. Performing comparative analysis to determine most cost efficient course of action.
5. Demonstrating effective communication in the following areas: writing, speaking, presentations, and small group interaction.
6. Understanding common operations and maintenance management software and their application.

<b>Units of Instruction:</b>		<b>Time Weight:</b>
		<b>Lecture Hours</b>
	Course introduction	1
	How building maintenance fits into the proforma	1
	Audits and deferred maintenance	2
	Benchmarking	2
	Outsourcing	2
	Developing schedules	2
	Computer Integrated Facility Management and Operations (CIFM)	1
	General concepts of maintenance estimating and budgeting	2
	Maintenance and repair estimating	2
	Preventive and predictive maintenance estimating	2
	General maintenance estimating	1
	Reserve Funding	2

	Value engineering	2
	Site maintenance	2
	Roofing maintenance	2
	Exterior finish maintenance	2
	Interior finish maintenance	2
	Acoustics and lighting	2
	Electrical systems	1
	Indoor air quality	2
	Hazardous materials	2
	Green buildings and intelligent buildings	2
	Security, signage, and wayfinding	1
	Americans with Disabilities Act (ADA)	1
	Evaluation	2
	<b>Total Hours:</b>	<b>45</b>