



COLLEGE OF ENGINEERING

HYSLOP SITE ADDITION AND RENOVATION MASTER PLAN

November 2022

CLARK & ENERSEN

ACKNOWLEDGMENTS

This report was prepared by Clark & Enersen, along with our design partners EAPC, for the University of North Dakota College of Engineering. Thank you to the following people for their contributions to this report.



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College of Engineering & Mines	76		
Registrar	80		

LEGEND

DEPARTMENTAL ACRONYMS		SPACE TYPES ICONS	
Petroleum Engineering	PE	Teaching Laboratories	
Geology & Geological Engineering	GEO&GE	Research Laboratories	
Civil Engineering	CE	Laboratory Support	
Chemical Engineering	CHEM E	Lecture & Classroom	
Electrical Engineering & Computer Science	EE&CS	Office & Administration	
Institute for Energy Studies	IES	Other	
Mechanical Engineering	MECH E		
College of Engineering & Mines	COE		
Registrar	REG		
Bio Medical Engineering	BIO E		
GENERAL ACRONYMS			
University of North Dakota	UND		
Clark & Enersen	CE		
Gross Square Feet	GSF		
Net Square Feet	NSF		
Net-To-Gross Ratio (i.e. NSF divided by GSF)	NTG		
College of Engineering & Mines	COE		

A

EXECUTIVE SUMMARY

INTRODUCTION

This report has been assembled to create a master plan for the UND College of Engineering to respond to future growth challenges and existing deficiencies in the overall engineering complex. The college of Engineering occupies a complex of interconnected buildings built and joined together over the course of six decades. The facilities and systems that serve them are now in various states of age and condition and the evolution and enrollment of the various engineering departments has created a situation where the facilities are ill positioned to respond to modern teaching and research as well as planned growth projections within the college. The design team was asked to investigate the condition of the facilities, quantify departmental growth and distribution across the complex and make recommendations for a long-term master plan for capital improvements to be implemented over time so that the college can respond to a host of coming challenges within its curriculum. The original masterplan published in February 2022, presented several options for direct additions and targeted renovations to the existing complex.

This document has been created to react to subsequent initiatives that would vacate some of the existing areas of the complex and provide a new construction project on a site to the east of the engineering complex. This new construction project will provide sufficient space to largely relocate the teaching and research space associated with the departments of Civil Engineering, Chemical Engineering, Electrical Engineering and Computer Science, and Biomedical Engineering along with most faculty and administrative offices. The project will also be designed in conjunction with a new STEM facility for the university.

EXECUTIVE SUMMARY

APPROACH AND PROCESS

The process of analyzing and formulating recommendations for the College of Engineering Masterplan involved three primary steps as follows: (1) Investigation and documentation of existing facilities and systems that make up the current complex. This included examination of existing drawings and documentation as well as on site investigation by architects and engineers to assess the type and condition of finishes, engineered systems, fixed furnishings and accessibility features in the existing complex. (2) Interviews with each department including department heads, faculty, administration and support staff to catalogue intended enrollment growth targets, identify programmatic deficiencies, and collect ideas that would enhance the college’s ability to attract students and faculty over the coming decades. (3) Formulation of various planning approaches that would pave the way for the college to meet the demands identified in step 2. This was an iterative process that involved the design team and building committee that met regularly over the duration of the endeavor. All information collected and iterative solutions identified were included in the February 2022 document. This revised report is focused on an alternative solution involving the Hyslop/Starcher site and it’s potential integration with the STEM building initiative.

GOALS AND OBJECTIVES

The goals and objectives of the masterplan include the following primary points:

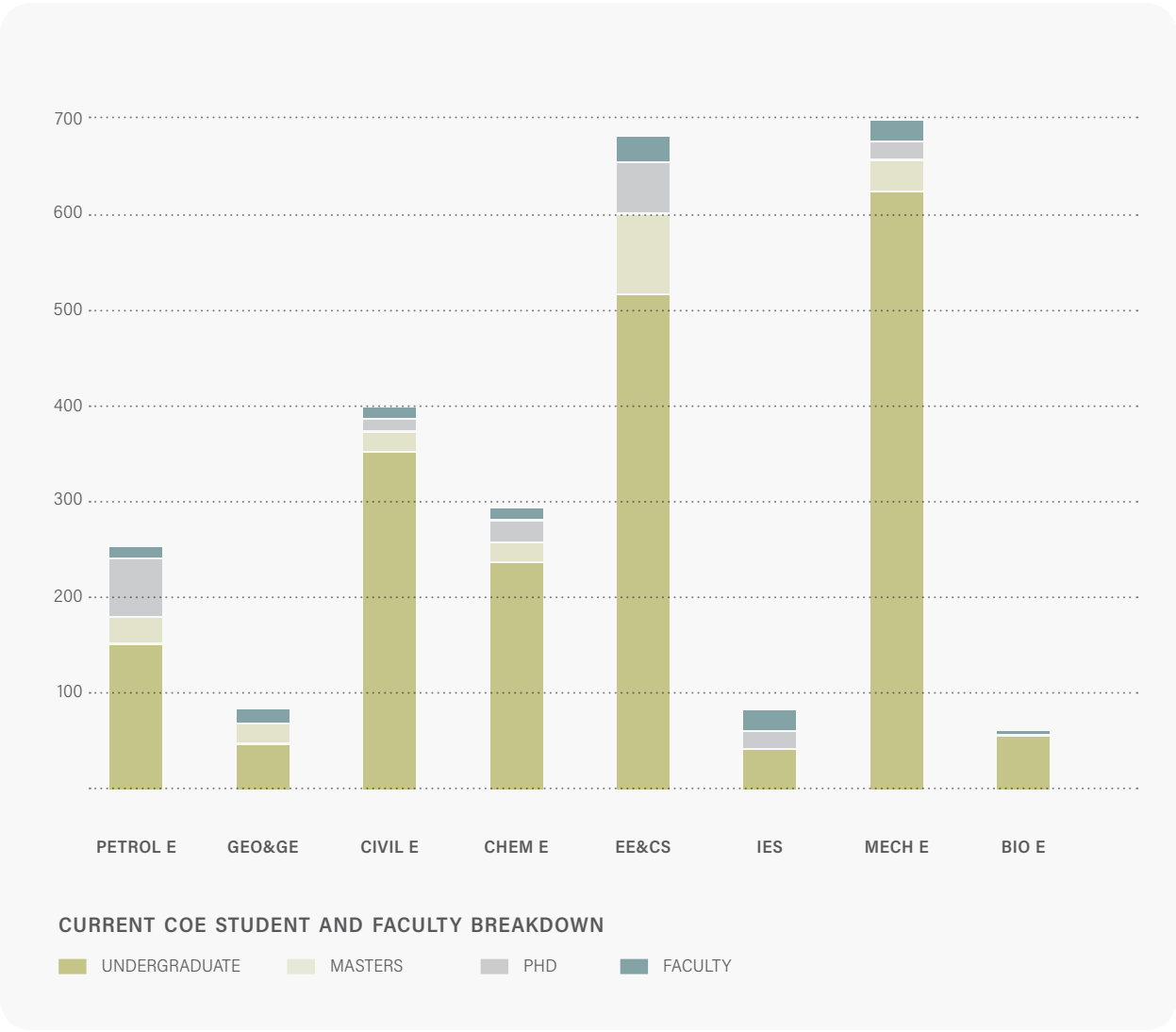
- Grow on campus enrollment to between 1,500 and 2,000 across all engineering departments
- Create a facility layout that strikes a proper balance between inter departmental collaboration and departmental identity
- Relocate some departments to new construction on the Hyslop site and vacate targeted portions of the existing complex
- Integrate Engineering Complex addition with new STEM building on the Hyslop site
- Improve connectivity and wayfinding
- Improve accessibility issues
- Organize complex to co-locate faculty groups
- Create facility that allows for greater optimization and sharing of research space and equipment
- Create a facility that improves ability to recruit both students and faculty
- Increase ability to expand faculty count to improve faculty to student ratio
- Expand access to computer classroom and work spaces
- Improve HVAC and electrical infrastructure in areas of the complex that are to remain



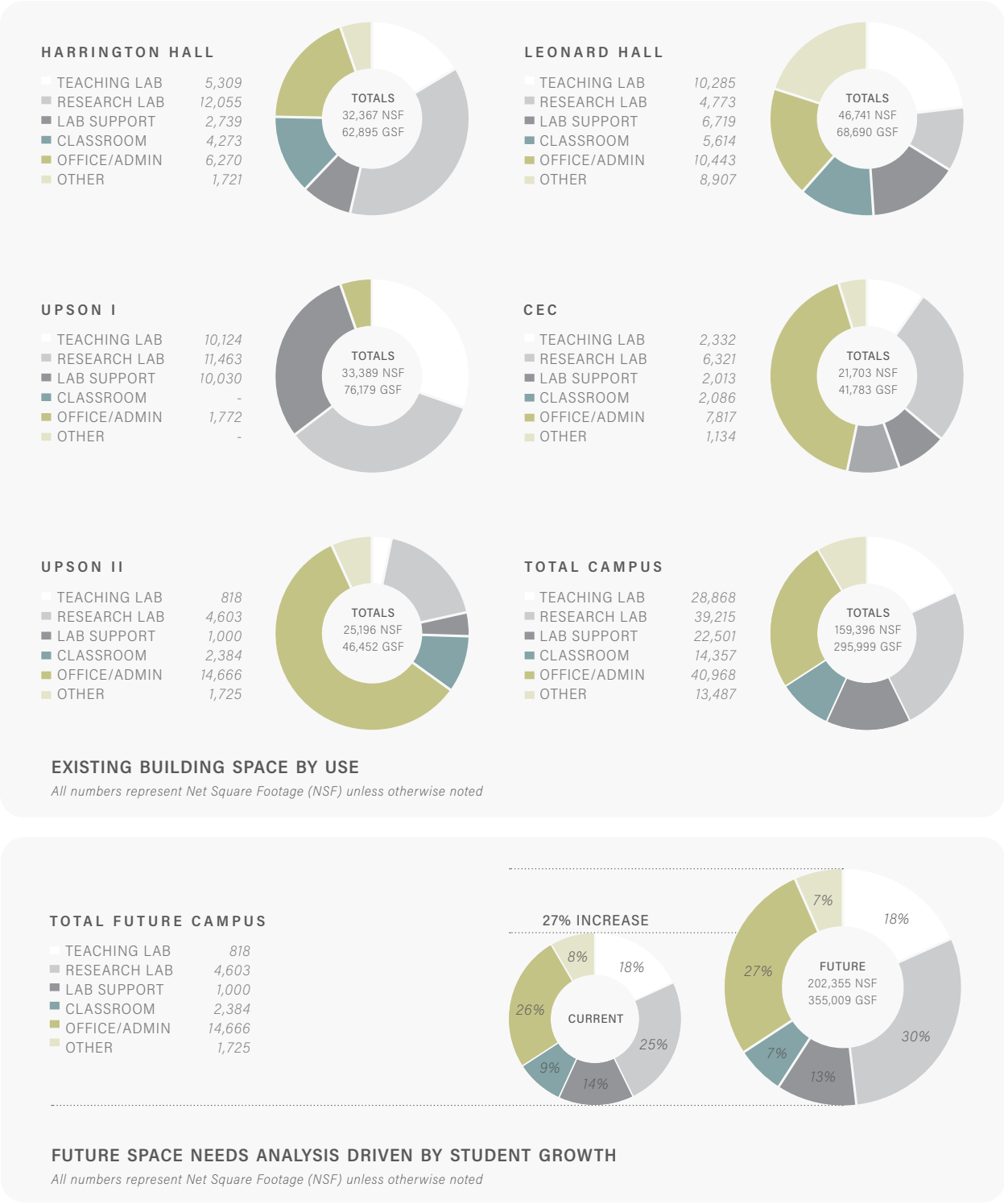
GROWTH ANALYSIS

ENROLLMENT ANALYSIS

The bar graph below shows the current student enrollment and faculty/staff counts for each of the eight primary engineering departments. These numbers were collected during the initial departmental interviews to gain a snap shot in time of the general scope of the college as a whole. Additional breakdowns of the current enrollment and employment numbers are shown in the departmental discussions later in this document. Note that the numbers shown below represent overall raw enrollment numbers and do not breakdown the counts between on-campus and on-line students. As the discussion of growth projections proceeds on the following pages and in the main body of the document, particular attention is paid to the on-campus projections as this will have a greater impact on needed facilities.

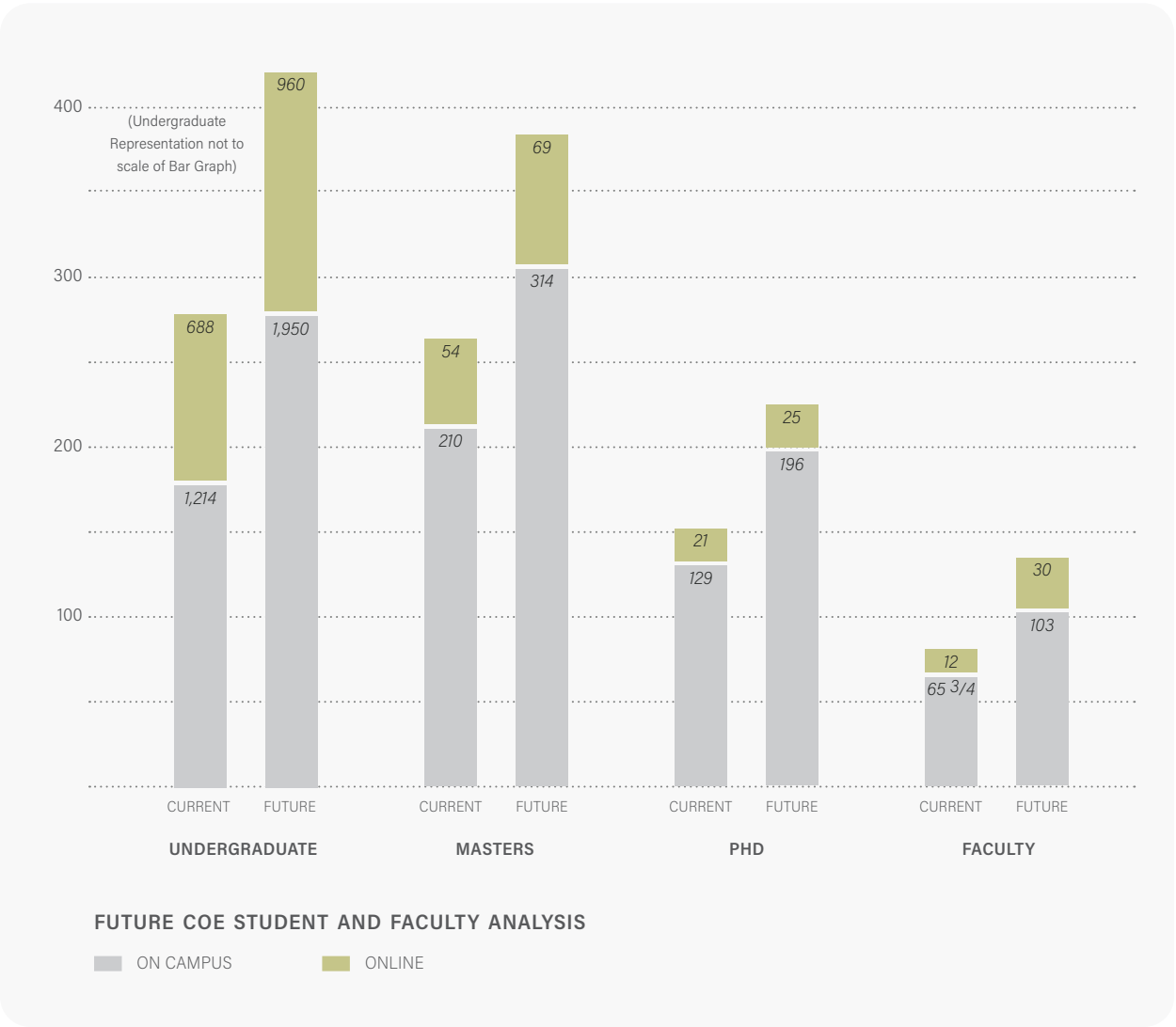


USE NSF. The graphic below indicates existing square footage identified both by use and building location within the complex.



SPACE NEEDS ANALYSIS

One of the initial steps in the departmental interview process included collecting growth projections and initiatives. The interviews where this information was established included college administration, department chairs and all faculty members. Each of the main engineering departments took part and expressed their individual wishes and these meetings were followed up and further adjusted in subsequent meetings with Dean's office and primary building committee. The graph below shows the anticipated growth projections across the entire college of engineering. This data is further broken down by department and expressed in greater detail in the main body of the masterplan later in this document. Overall growth in all departments is shown for undergraduate students, masters students, PhD students and faculty.



DEPARTMENTAL NSF

The existing net square footage numbers in the tabulation shown below were established by extensive building tours and analysis of the existing floor plans. Additional breakdown of the space allocation by department is further delineated later in this document under the departmental description sections. The proposed Net square footage column comes from the current program plan that was created through an iterative process working with the college administration and building committee. The growth in net square footage was determined by identifying needs in the following categories:

- Growth in teaching and research and industrial laboratory space based on expressed needs coming from departmental discussions and reviewed by college administration and the building committee
- Provision of faculty and staff offices in accordance with growth projections (all faculty office spaces were sized according to current university guidelines and in some cases, square footage dedicated to office space was significantly reduced
- Provision of adequate office space for on-campus masters and PhD students in accordance with growth projections
- Growth needs to accommodate new laboratory research and instructional initiatives

DEPARTMENT	EXISTING NSF	PROPOSED NSF	PROPOSED GSF	
Petroleum Engineering	9,199	17,228	30,225	87%
Geology & Geological Engineering	32,063	28,559	50,104	-11%
Civil Engineering	14,373	22,540	39,544	57%
Chemical Engineering	15,232	21,711	38,089	43%
Electrical Engineering & Computer Science	13,812	19,453	34,128	41%
Institute for Energy Studies	7,116	9,935	17,430	40%
Mechanical Engineering	27,617	35,436	62,168	28%
College of Engineering	22,952	24,404	42,814	6%
Registrar	14,362	13,387	23,486	-7%
Biomedical Engineering	2,670	9,702	17,021	263%
Totals	159,396	202,355	355,009	27%

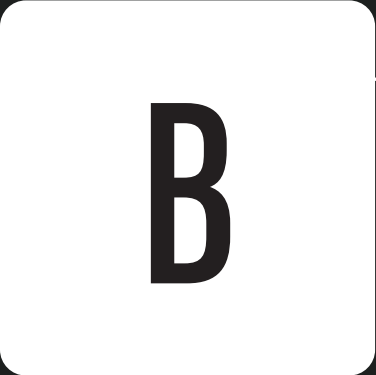
HYSLOP / STARCHER SITE

The project defined in this report calls for the demolition of the Hyslop Sports Center and subsequent construction of a new College of Engineering Addition and integrated STEM project. This summary only includes those programmatic elements for the College of Engineering as the STEM program is yet to be defined. The new construction for the College of Engineering on the Hyslop site will be comprised of approximately 179,000 gross square feet and will provide new space to serve virtually all programmatic needs for Civil Engineering, Chemical Engineering, Electrical Engineering & Computer Science and Biomedical Engineering. The new construction will also relocate most faculty offices and administrative functions for the Dean's office and College as a whole. Upon completion of the new construction on the Hyslop site, the College of Engineering will be in a position to vacate all of the existing Harrington and Upson II facilities. These current portions of the College of Engineering complex can then either be demolished or converted to other purposes.

In addition to the new construction on the Hyslop site, this report also calls for a targeted series of renovations to the Upson I facility and Leonard Hall to upgrade the facilities for the remaining departments including Mechanical Engineering, Petroleum Engineering, the Institute for Energy Studies and the department of Geology and Geological Engineering. Current cost estimates for the work in this study appearing below, do not include any soft costs, escalation or site work.

HYSLOP STARCHER SITE	COST
New Construction	\$94,000,000
Subsequent Phased Renovations to Existing Complex	\$24,600,000
Total	\$118,600,000





EXISTING FACILTIES

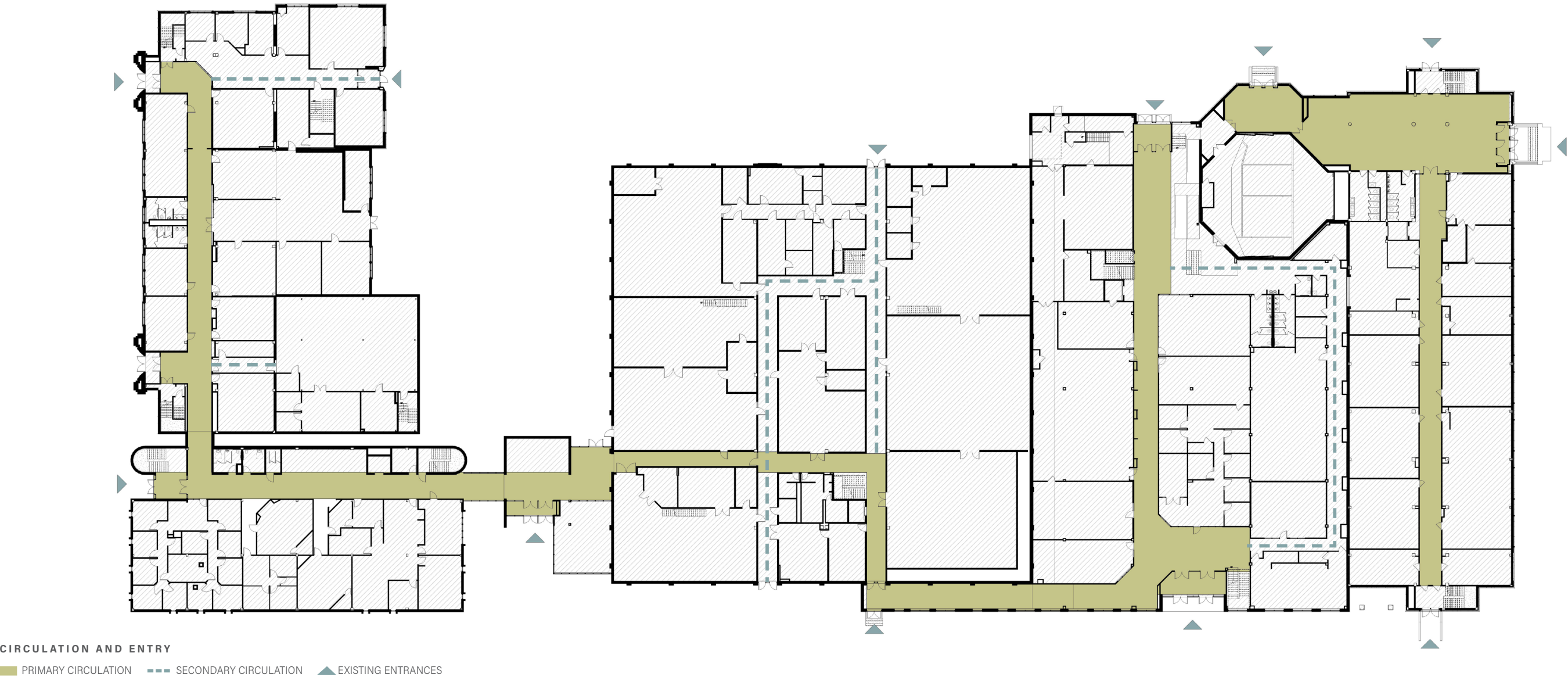
CAMPUS OVERVIEW

The college of Engineering complex includes five interconnected structures that have been built over the course of nearly 70 years. The east and west ends of the complex are the oldest and include Harrington Hall on the west, built in 1952 and Leonard Hall on the east, built in 1964. Upson I is the primary high bay laboratory space serving the college and was originally a stand-alone structure built in between Leonard and Harrington in 1971. In 1974, Upson II was constructed along the south side of Harrington Hall and was subsequently connected to Upson I via a single-story connector. The most recent major addition was the Collaborative Energy Complex, completed in 2016 between Leonard Hall and Upson I.

EXISTING FACILITIES OVERVIEW

WAYFINDING AND CIRCULATION

Wayfinding and general circulation across the engineering complex is not ideal. As the various additions have been added over the years, an east/west pathway has evolved that moves to the north and south in the area of Upson I and emerges into corridor built as part of the CEC construction before turning back to the north to enter Leonard Hall at the north end. The main on grade floors in most of the complex do align with the exception of the transition from CEC into Leonard Hall. The vertical offset in this area is approximately four feet. One of the main impediments to horizontal circulation is the varied story height of the buildings that make up the complex.





1952

62,895 GSF

The tables below show the square footage by use and department for Harrington Hall.

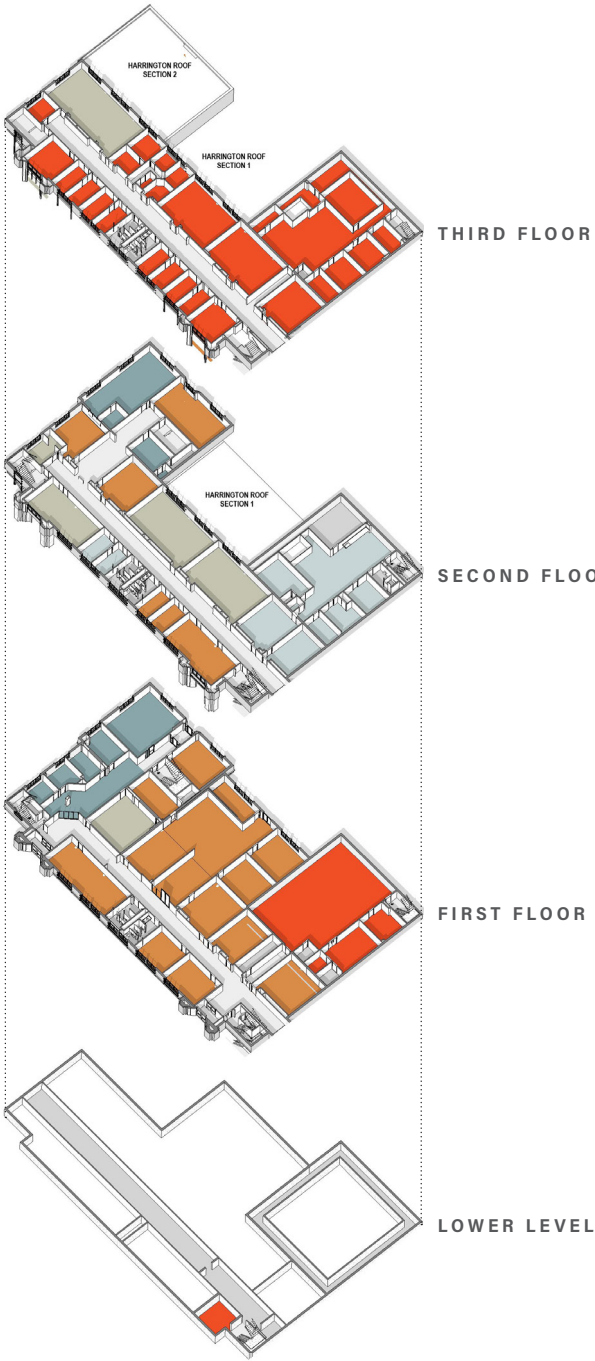
STATS	
# OF LEVELS	4
NSF	32,367 NSF
GSF	62,895 GSF
SPACE TYPES (NSF)	
PE	-
GEO E	-
CIVIL E	1,134 SF
CHEM E	13,751 SF
EE&CS	9,231 SF
IES	-
MECH E	-
BIO E	-
COE	3,978 SF
REG	4,273 SF
USE BREAKOUT	
TEACHING LAB	5,309 SF
RESEARCH LAB	12,055 SF
LAB SUPPORT	2,739 SF
LECTURE	4,273 SF
OFFICE + ADMIN	6,270 SF
OTHER	1,721 SF

HARRINGTON HALL

BUILDING SUMMARY

Harrington Hall was constructed in 1952 and is comprised of approximately 62,895 gross square feet. The building is 3 stories above grade with a largely unoccupied basement area that mostly houses mechanical HVAC equipment. It appears that Harrington Hall was the Harrington Hall is the oldest portion of the complex and was one of the original campus buildings dedicated to engineering. The original construction consisted of a cast-in-place concrete structure with a three-story portion along the west and a large single story high bay on the east. Prior to the construction of Upson II, a three-story addition was added to the southeast corner structure, apparently to provide an interconnected series of mezzanines and high bay shafts to accommodate research and teaching in Chemical engineering. The façade is mostly brick with windows lined in stone tracery in a gothic motif, primarily along the west façade. Another major addition occurred in 2008 to north end of Harrington Hall to add office and some teaching space for the JODASS program. Harrington Hall connects directly to Upson II to the south. The floors and main corridor align, but there is a slight ramp up into Upson II (about 8 inches) on several floors.

Harrington Hall accommodates shared and dedicated program space for several departments. It is fair to say that among all of the buildings that make up the complex, Harrington Hall hosts the most diverse and wide-reaching collection of departmental spaces. The first floor spaces include several computer and electrical engineering laboratories of various sizes, a registrar scheduled classroom and the first floor of the chemical engineering teaching and research areas that is housed in the southeast three-story addition. The north end of the first floor is occupied by office space for the JODASS program. The second floor of Harrington Hall houses additional JODASS space, electrical engineering teaching laboratories as well as four EE&CS faculty offices, The second level of the Chemical Engineering teaching and research laboratories, a shared senior research projects lab, civil engineering computational spaces and three centrally scheduled classrooms. The third floor of Harrington Hall mostly houses spaces dedicated to Chemical Engineering including research labs, teaching labs and faculty offices.



DEPARTMENT BREAKOUT LEGEND

- | | | |
|---|----------------------------------|-------------------------------|
| ■ CHEMICAL ENGINEERING | ■ CIVIL ENGINEERING | ■ BIOMEDICAL ENGINEERING |
| ■ ELECTRICAL ENGINEERING + COMPUTER SCIENCE | ■ COLLEGE OF ENGINEERING + MINES | ■ INSTITUTE OF ENERGY STUDIES |
| ■ GEOLOGY + GEOLOGICAL ENGINEERING | ■ PETROLEUM ENGINEERING | ■ BUILDING SUPPORT |
| ■ MECHANICAL ENGINEERING | ■ REGISTRAR | ■ CIRCULATION |



USE BREAKOUT LEGEND

- | | |
|----------------------------------|--------------------|
| ■ CLASSROOM / LABORATORY SUPPORT | ■ RESTROOMS |
| ■ CLASSROOM / LABORATORY | ■ BUILDING SUPPORT |
| ■ HIGH BAY | ■ CIRCULATION |
| ■ OFFICE / ADMINISTRATION | |



1974

46,452 GSF

The tables below show the square footage by use and department for Upson II.

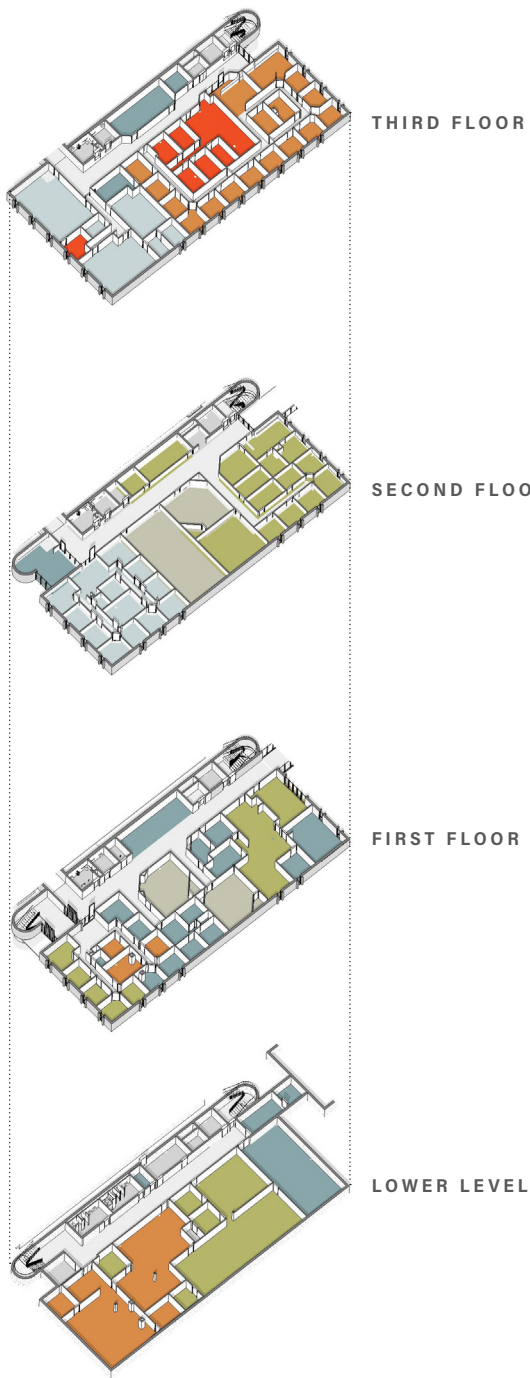
STATS	
# OF LEVELS	4
NSF	25,196 NSF
GSF	46,452 GSF
SPACE TYPES (NSF)	
PE	-
GEO E	-
CIVIL E	3,995 SF
CHEM E	1,098 SF
EE&CS	2,902 SF
IES	-
MECH E	5,008 SF
BIO E	2,670 SF
COE	7,060 SF
REG	2,463 SF
USE BREAKOUT	
TEACHING LAB	818 SF
RESEARCH LAB	4,603 SF
LAB SUPPORT	1,000 SF
LECTURE	2,384 SF
OFFICE + ADMIN	14,666 SF
OTHER	1,725 SF

UPSON II

BUILDING SUMMARY

Upson II was constructed in 1974 and is comprised of approximately 46,452 gross square feet. It includes three stories above grade plus an occupied basement. The structure occupies a narrow footprint with a cast-in-place concrete structure and brick façade with narrow aluminum framed windows and is inconsistent with the context of the adjoining Harrington Hall. Upson II mostly aligns and connects with all three floors of Harrington Hall and connects to the rest of the complex only at the ground level.

The basement of Upson II houses laboratory space for the Bio-engineering program and the Mechanical Engineering department as well as a shared core facility for imaging instrumentation. The Dean’s office for the College of Engineering and Mines is located on the first floor along with two, small underutilized classrooms and a portion of the faculty offices for Mechanical Engineering. The second floor is organized similarly to the first with two additional small classrooms and the majority of the faculty offices for Mechanical and Civil Engineering. The third floor includes the faculty offices for Electrical Engineering & Computer Science as well as faculty offices for Chemical Engineering. The third floor also includes two teaching / research laboratories for environmental engineering associated with the Chemical Engineering department and some space for graduate students in that program.



DEPARTMENT BREAKOUT LEGEND

CHEMICAL ENGINEERING

ELECTRICAL ENGINEERING + COMPUTER SCIENCE

GEOLOGY + GEOLOGICAL ENGINEERING

MECHANICAL ENGINEERING

CIVIL ENGINEERING

COLLEGE OF ENGINEERING + MINES

PETROLEUM ENGINEERING

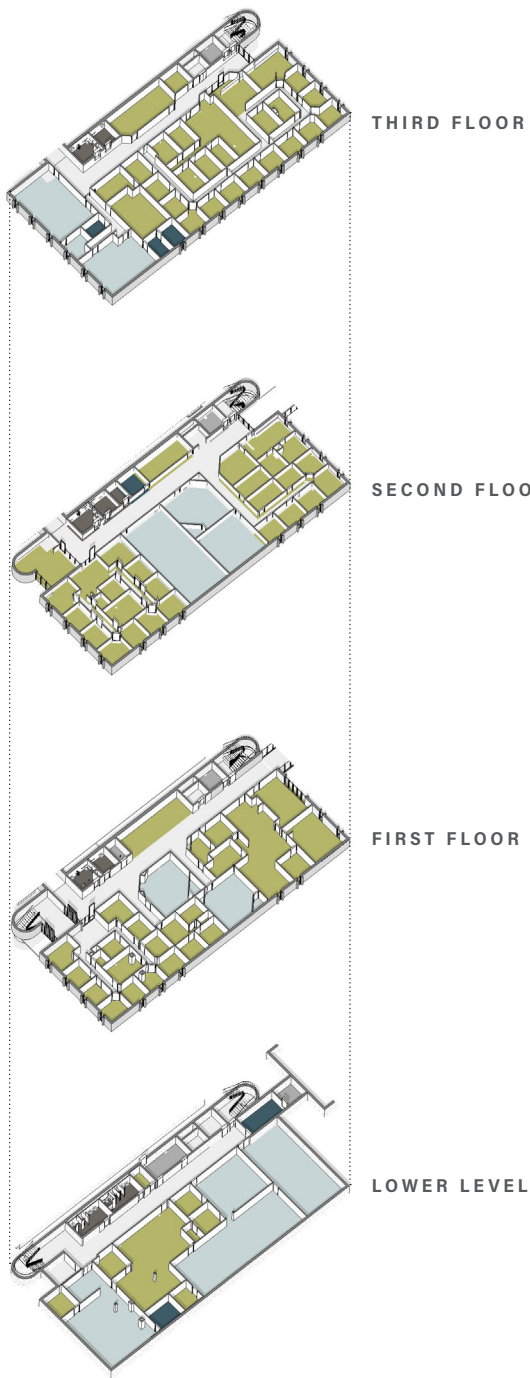
REGISTRAR

BIOMEDICAL ENGINEERING

INSTITUTE OF ENERGY STUDIES

BUILDING SUPPORT

CIRCULATION



USE BREAKOUT LEGEND

CLASSROOM / LABORATORY SUPPORT

CLASSROOM / LABORATORY

HIGH BAY

OFFICE / ADMINISTRATION

RESTROOMS

BUILDING SUPPORT

CIRCULATION



1971

76,179 GSF

The tables below show the square footage by use and department for Upson I.

STATS	
# OF LEVELS	2
NSF	33,389 NSF
GSF	76,179 GSF
SPACE TYPES (NSF)	
PE	-
GEO E	9,244 SF
CIVIL E	383 SF
CHEM E	-
EE&CS	-
IES	22,609 SF
MECH E	-
BIO E	1,153 SF
COE	-
REG	-
USE BREAKOUT	
TEACHING LAB	10,124 SF
RESEARCH LAB	11,463 SF
LAB SUPPORT	10,030 SF
LECTURE	-
OFFICE + ADMIN	1,772 SF
OTHER	-

UPSON I

BUILDING SUMMARY

Upson I was constructed in 1971 and is comprised of approximately 76,179 gross square feet. It is a two story structure and was originally constructed to provide the bulk of the high bay, industrial teaching and research space for the Mechanical and Civil Engineering programs. Approximately two-thirds of it's footprint is a single tall story for high bay space along the eastern and western thirds while the center third of the building accommodates a mezzanine level with various medium and small sized spaces that serve as teaching laboratories and small graduate office and storage spaces. The façade of the building has very few windows and provides overhead sectional doors into the high bay spaces along the west side, creating large vehicle and equipment entrances for the high bay spaces. The high bay spaces along the east side of the facility do not have sufficient overhead door access.

The first floor high bay spaces generally accommodate Mechanical Engineering operations along the west side of the first floor and Civil Engineering spaces along the east. A large portion of the high bay spaces are served on each side by three bridge cranes that can move north and south over the top of the existing concrete masonry partitions separating the large high bay spaces. The center portion of the first floor provides storage and support space such as small lab alcoves, a welding shop and a laser laboratory. The second floor mezzanine area has a single, double loaded corridor running north and south and provides space for Mechanical Engineering teaching and research labs along with small office spaces for Civil and Mechanical Engineering graduate students as well as research spaces that are shared among various departments and programs.



SECOND FLOOR

FIRST FLOOR

DEPARTMENT BREAKOUT LEGEND

- | | | |
|---|--|--|
| ■ CHEMICAL ENGINEERING | ■ CIVIL ENGINEERING | ■ BIOMEDICAL ENGINEERING |
| ■ ELECTRICAL ENGINEERING + COMPUTER SCIENCE | ■ COLLEGE OF ENGINEERING + MINES | ■ INSTITUTE OF ENERGY STUDIES |
| ■ GEOLOGY + GEOLOGICAL ENGINEERING | ■ PETROLEUM ENGINEERING | ■ BUILDING SUPPORT |
| ■ MECHANICAL ENGINEERING | ■ REGISTRAR | ■ CIRCULATION |



SECOND FLOOR

FIRST FLOOR

USE BREAKOUT LEGEND

- | | |
|--|--|
| ■ CLASSROOM / LABORATORY SUPPORT | ■ RESTROOMS |
| ■ CLASSROOM / LABORATORY | ■ BUILDING SUPPORT |
| ■ HIGH BAY | ■ CIRCULATION |
| ■ OFFICE / ADMINISTRATION | |



1964

68,690 GSF

The tables below show the square footage by use and department for Leonard Hall.

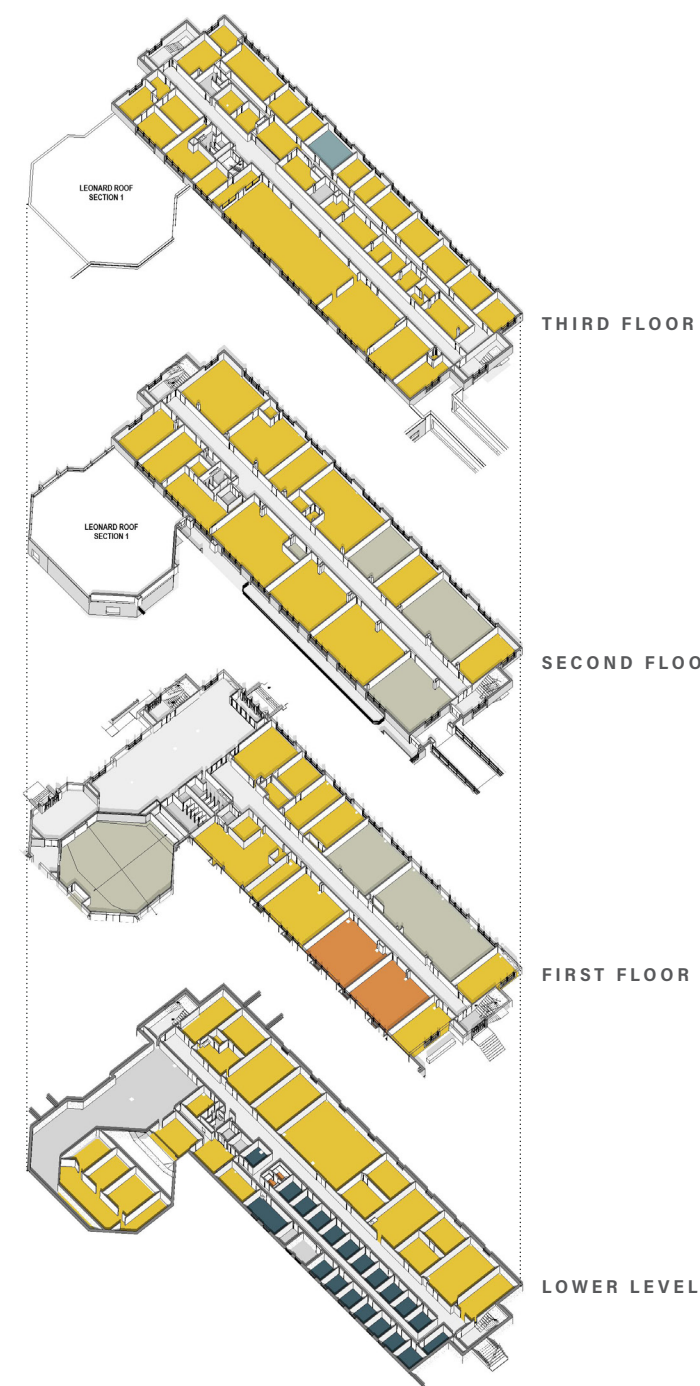
STATS	
# OF LEVELS	4
NSF	46,741 NSF
GSF	68,690 GSF
SPACE TYPES (NSF)	
PE	2,229 SF
GEO E	32,063 SF
CIVIL E	-
CHEM E	-
EE&CS	1,679 SF
IES	-
MECH E	-
BIO E	-
COE	3,144 SF
REG	7,626 SF
USE BREAKOUT	
TEACHING LAB	10,285 SF
RESEARCH LAB	4,773 SF
LAB SUPPORT	6,719 SF
LECTURE	5,614 SF
OFFICE + ADMIN	10,443 SF
OTHER	8,907 SF

LEONARD HALL

BUILDING SUMMARY

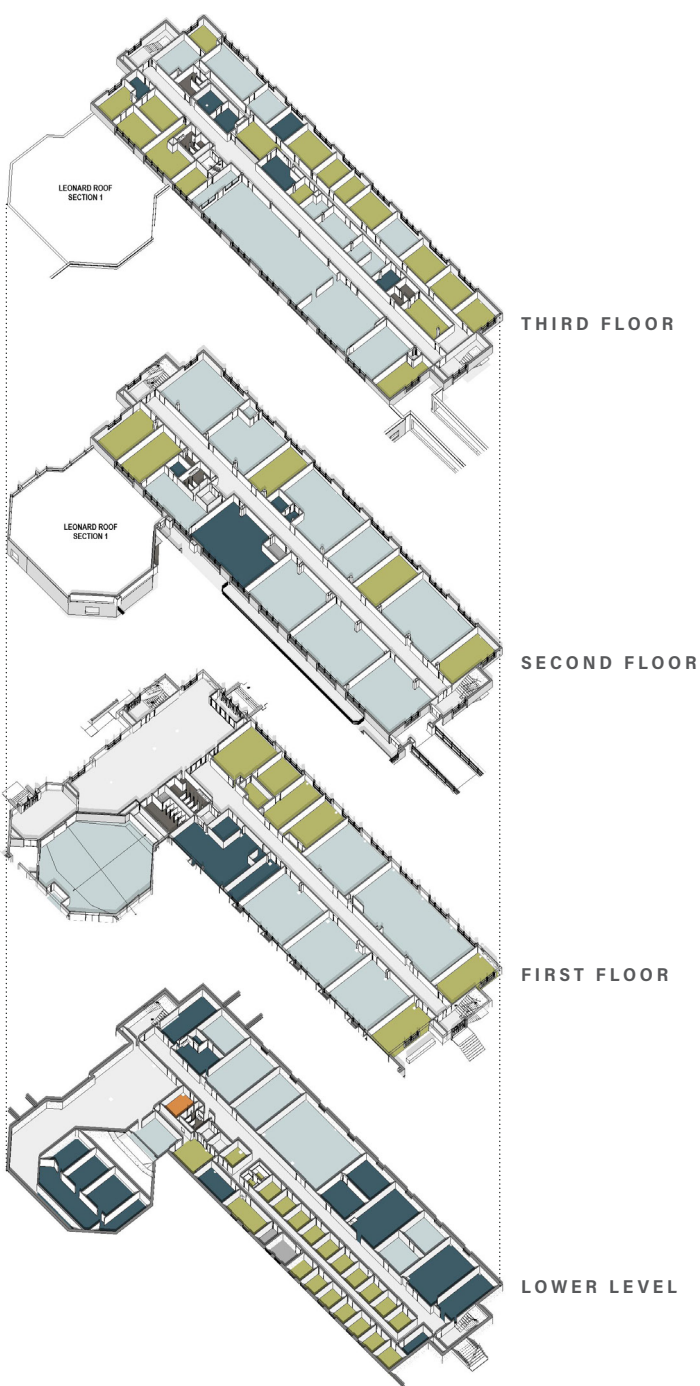
Leonard Hall was constructed in 1964 and is comprised of approximately 68,690 gross square feet in a historic structure including a basement, three floors above grade and third floor clerestory and small penthouse. It was originally built as the home of the Geology Department and the masonry exterior and interior masonry construction near the main entrance and in the main lobby are in laid with various fossils and geological specimens. All four floors are organized along a single double loaded corridor with the exception of the third floor that has a secondary corridor along the eastern half of the floor plate. The structure is cast in place concrete. The structure also houses a large lecture hall on the northwest corner of the original structure.

Most of the building is assigned to the Geology and Geological Engineering Department with a few exceptions. The eastern half of the basement layout provides a large amount of storage and industrial wet lab space to serve as storage and prep space for the Geology department's large collection of fossil and geological specimens as well as field equipment storage and some geology teaching and research space. The west half the basement floor provides a series of small rooms that are largely dedicated to graduate student office space for the Petroleum Engineering program. The north end of the first floor provides the main east entrance into the engineering complex. The lobby space in this area was originally designed as a display and open museum space that is still used in the same manner today with numerous fossil and geological specimens. The double loaded corridor extending south from this area provides access to two of the larger registrar classrooms in the complex as well as two classrooms that have been assigned to the Electrical Engineering program for use as computational teaching and research laboratories. The balance of the space is assigned to Geology and Geological Engineering and includes teaching labs and faculty offices. The faculty offices for Geology on this floor and for the floors above were originally designed to be used as office space as well as faculty research space which creates faculty offices for this program that are in some cases as large as 400 net square feet. This is well outside of the current norm and campus standards for net assignable square feet for office space. The second floor of Leonard Hall includes three additional medium sized classrooms that are centrally scheduled by the registrar with the balance of the spaces assigned to the Geology and Geological Engineering department to accommodate teaching and research labs as well as additional large faculty offices. The third floor of Leonard Hall is almost entirely assigned to Geology and Geological Engineering to accommodate some of the smaller laboratory spaces in the program, additional large faculty offices and the FD Holland Jr Geology and Geological Engineering Library. The library occupies roughly one third of the assignable square footage of the floor and includes a relocated steel library stack mezzanine over a portion of the space to expand storage capacity.



DEPARTMENT BREAKOUT LEGEND

- | | | |
|---|----------------------------------|-------------------------------|
| ■ CHEMICAL ENGINEERING | ■ CIVIL ENGINEERING | ■ BIOMEDICAL ENGINEERING |
| ■ ELECTRICAL ENGINEERING + COMPUTER SCIENCE | ■ COLLEGE OF ENGINEERING + MINES | ■ INSTITUTE OF ENERGY STUDIES |
| ■ GEOLOGY + GEOLOGICAL ENGINEERING | ■ PETROLEUM ENGINEERING | ■ BUILDING SUPPORT |
| ■ MECHANICAL ENGINEERING | ■ REGISTRAR | ■ CIRCULATION |



USE BREAKOUT LEGEND

- | | |
|----------------------------------|--------------------|
| ■ CLASSROOM / LABORATORY SUPPORT | ■ RESTROOMS |
| ■ CLASSROOM / LABORATORY | ■ BUILDING SUPPORT |
| ■ HIGH BAY | ■ CIRCULATION |
| ■ OFFICE / ADMINISTRATION | |



2016
41,183 GSF

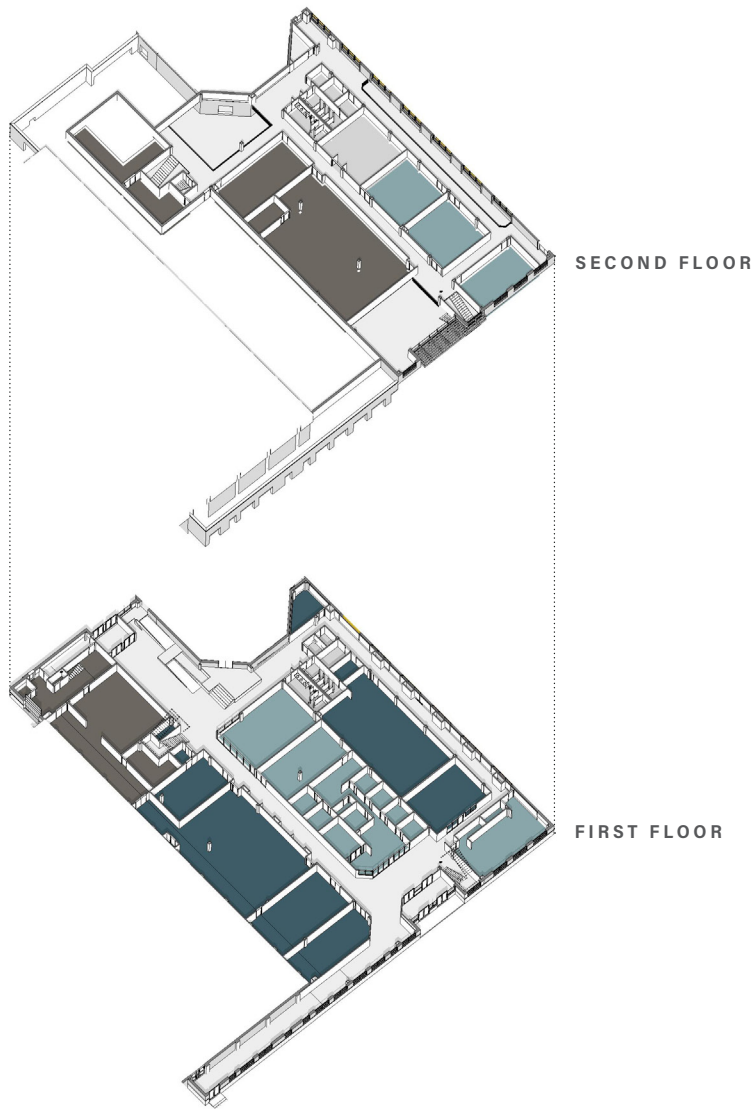
The tables below show the square footage by use and department for Collaborative Energy Center.

STATS	
# OF LEVELS	2
NSF	21,703 NSF
GSF	41,183 GSF
SPACE TYPES (NSF)	
PE	6,970 SF
GEO E	-
CIVIL E	-
CHEM E	-
EE&CS	-
IES	7,116 SF
MECH E	-
BIO E	-
COE	7,617 SF
REG	-
USE BREAKOUT	
TEACHING LAB	2,332 SF
RESEARCH LAB	6,321 SF
LAB SUPPORT	2,013 SF
LECTURE	2,086 SF
OFFICE + ADMIN	7,817 SF
OTHER	1,134 SF

COLLABORATIVE ENERGY CENTER

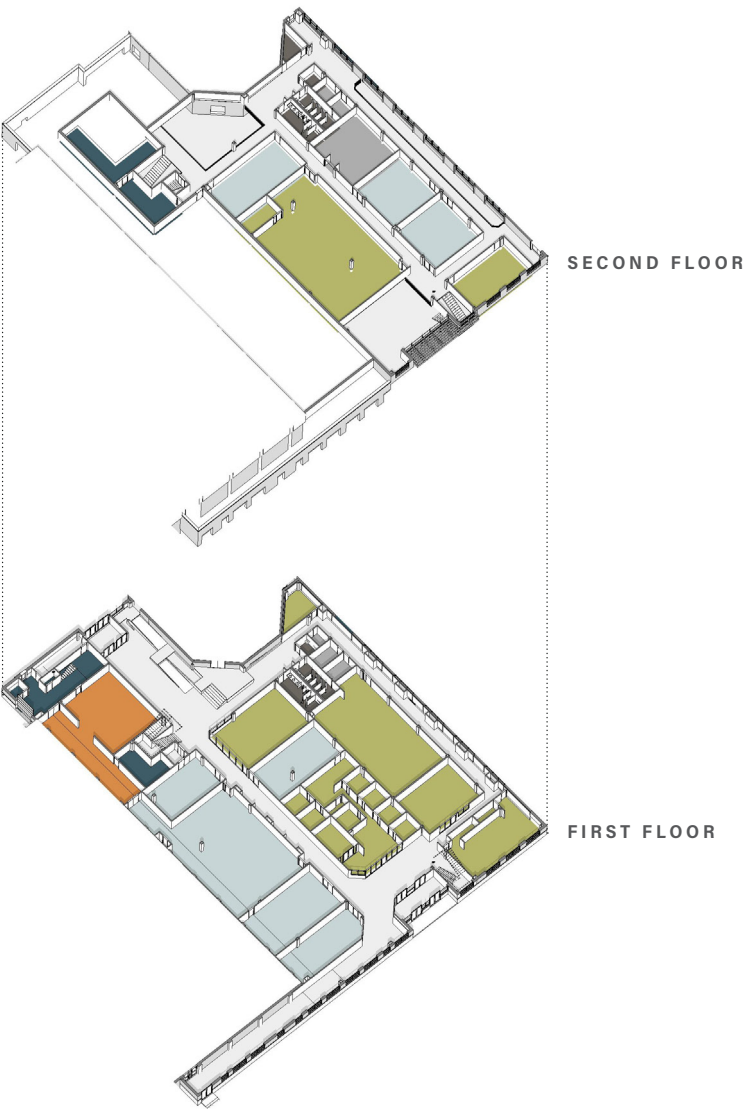
BUILDING SUMMARY

The Collaborative Energy Center was constructed in 20016 and is comprised of approximately 41,183 gross square feet. It is the most recent addition to the complex and is a steel framed, two story addition constructed between Leonard Hall and Upson I, in some cases with the existing exterior façade and windows used as the interior wall surface. It is the only building within the complex that was built without a basement level. It was built primarily to provide space for the Petroleum Engineering program and the Institute for Energy Studies. The first floor provides space for Petroleum Engineering teaching and research laboratories and associated open faculty office space. It also provides shared research and student projects space as well as the lower level of the Institute for Energy Studies High Bay research lab. A connecting overhead door connects a fabrication bay to the northeast high bay space in Upson I. The main floor aligns with the adjacent space in Upson I and is offset from the adjoining Leonard Hall by approximately 4'-0". The second floor of the facility connects with the second floor of Leonard Hall at the south end of the structure, but does not communicate with any upper story space in Upon I. The second floor of the Collaborative Energy Center includes space for IES graduate students and a small shared wet laboratory as well as teaching and classroom spaces scheduled by the college and the executive training room.



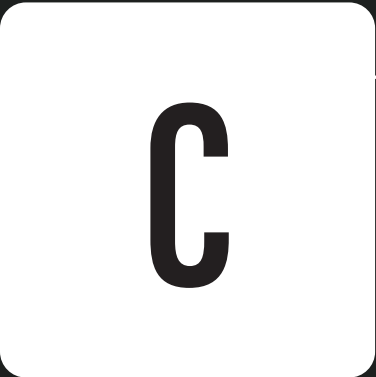
DEPARTMENT BREAKOUT LEGEND

- | | | |
|---|--------------------------------|-----------------------------|
| CHEMICAL ENGINEERING | CIVIL ENGINEERING | BIOMEDICAL ENGINEERING |
| ELECTRICAL ENGINEERING + COMPUTER SCIENCE | COLLEGE OF ENGINEERING + MINES | INSTITUTE OF ENERGY STUDIES |
| GEOLOGY + GEOLOGICAL ENGINEERING | PETROLEUM ENGINEERING | BUILDING SUPPORT |
| MECHANICAL ENGINEERING | REGISTRAR | CIRCULATION |



USE BREAKOUT LEGEND

- | | |
|--------------------------------|------------------|
| CLASSROOM / LABORATORY SUPPORT | RESTROOMS |
| CLASSROOM / LABORATORY | BUILDING SUPPORT |
| HIGH BAY | CIRCULATION |
| OFFICE / ADMINISTRATION | |



SPACE EVALUATION

INTRODUCTION

As part of this study, all departments within the College of Engineering and Mines participated in a series of interviews to discuss the current state of the department and project growth needs, both in terms of student and faculty counts as well as laboratory and office space to accommodate this growth and future expansion anticipated by new initiatives in the various programs. The following is a brief listing of those findings that were use d to formulate the long-term goals for the facilities.



PE

PETROLEUM ENGINEERING
DEPARTMENT SUMMARY

The Petroleum Engineering Department is primarily housed in the Collaborative Energy Center and the basement of Leonard Hall. The current enrollment in this program includes 140 undergraduate students, 20 master’s students and 60 PhD candidates with 7 full-time faculty positions. This enrollment typically ranks fourth in the nation among all petroleum engineering programs. The undergraduate student enrollment is projected to grow from 140 to 200 students in the near future while the graduate and PhD programs are planned to remain close to current levels into the future. With this growth, it is anticipated that 2 to 3 new faculty hires will be required for a total 10 full time positions.

The total net square footage within the existing engineering complex that is dedicated to Petroleum Engineering totals approximately 9,200 nsf. The department also utilizes a remote high bay site at a former power plant that provides additional industrial lab space that is approximately 10,200 square feet. The college uses this space for research involving large drill rigs and full-scale extraction equipment. The possibility of planning for new space to accommodate this full-scale equipment on campus as part of an expanded engineering complex was discussed, but it was decided that at this time, it would be difficult and potentially unsafe to provide access into the heart of campus for this purpose.

SPACE PROJECTIONS	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
Net Square Feet (NSF)			
TEACHING LABORATORIES	2,332	4,962	1. Petroleum Engineering Teaching Lab (146) is doubled in size
RESEARCH LABORATORIES	2,480	4,658	2. New Computational Laboratory
LABORATORY SUPPORT	-	-	3. Industrial Drill Laboratory
LECTURE AND CLASSROOM	-	-	4. Existing Wet Research Laboratory is doubled
OFFICE AND ADMINISTRATION	4,387	7,608	5. Faculty Office count grows from 7 to 10
OTHER	-	-	6. Visiting Faculty Offices are added
TOTAL	9,199	17,288	7. Staff and Administrative Office count grows from 2 to 10
			8. PhD Office count to accommodate 60 occupants (existing shown for approximately 48 occupants)
			87% Increase

PERSONNEL PROJECTIONS	CURRENT	FUTURE	NOTES
C/O: On Campus/Online			
UNDERGRADUATE STUDENTS (C/O)	140 / -	200 / -	
MASTERS STUDENTS (C/O)	20 / -	20 / -	
PHD STUDENTS (C/O)	60 / -	60 / -	
FACULTY	7	10 (+ 10 FT)	
NSF PER STUDENT ON CAMPUS	42 NSF	60 NSF	

SPACE SUMMARY



Teaching Laboratories

Virtual Reality Laboratory	140	605	1	605	605	0	1,061
PE Teaching Laboratory	146	1,000	1	2,178	2,178	1,178	3,821
Drill Simulation Laboratory	148	727	1	727	727	0	1,275
Industry Partner Computational Laboratory	New	0	1	1,452	1,452	1,452	2,547



Research Laboratories

Hess Innovation Laboratory	144	2,480	1	2,480	2,480	0	4,351
New PE Research Laboratory	New	0	1	2,178	2,178	2,178	3,821
Drill Research High Bay	-	0	0	0	0	0	0



Office & Administrative

Department Chair Office	113K	203	1	170	170	-33	298
Faculty Office	113C	124	0	0	0	-124	0
Faculty Office	113D	115	0	0	0	-115	0
Faculty Office	113E	116	0	0	0	-116	0
Faculty Office	113F	117	0	0	0	-117	0
Faculty Office	113G	114	0	0	0	-114	0
Faculty Office	113H	109	0	0	0	-109	0
Faculty Office	113J	109	0	0	0	-109	0
Faculty Office	New	0	10	120	1,200	1,200	2,105
Visiting Faculty Office	New	0	2	120	240	240	421
Staff / Administrative Offices	113A	123	0	0	0	-123	0
Staff / Administrative Offices	113B	115	0	0	0	-115	0
Staff / Administrative Offices	New	0	10	100	1,000	1,000	1,754
PhD Office	6	110	0	0	0	-110	0
PhD Office	8	110	0	0	0	-110	0
PhD Office	10	112	0	0	0	-112	0
PhD Office	12	110	0	0	0	-110	0
PhD Office	14	112	0	0	0	-112	0
PhD Office	16	110	0	0	0	-110	0
PhD Office	18	112	0	0	0	-112	0
PhD Office	20	110	0	0	0	-110	0
PhD Office	22	112	0	0	0	-112	0
PhD Office	24	110	0	0	0	-110	0
PhD Office	28	125	0	0	0	-125	0
PhD Office	30	108	0	0	0	-108	0
PhD Office	32	108	0	0	0	-108	0
PhD Office	34	108	0	0	0	-108	0
PhD Office	36	108	0	0	0	-108	0
PhD Office	38	108	0	0	0	-108	0
PhD Office	40	108	0	0	0	-108	0
PhD Office	42	244	0	0	0	-244	0

PhD Office

45

104

0

0

0

-104

0

PhD Office Cubicles

113 no.

715

0

0

0

-715

0

PhD Open Office

New

0

60

80

4,800

4,800

8,421

Student Work Space

113 so.

198

1

198

198

0

347

TOTALS

9,199

17,228

8,029

30,225



GEO E

The tables below show the net square footage, enrollment and full-time faculty numbers for both the current and future state associated within the Geology and Geological Engineering department to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve the department.

GEOLOGY + GEOLOGICAL ENGINEERING
DEPARTMENT SUMMARY

The Geology and Geological Engineering Department is primarily housed in Leonard Hall. The current enrollment in this program includes 45 undergraduate students and 15 master's students with 10 full-time faculty positions. This department differs from most others within the college in that it's curriculum includes a major earth science division that provides instruction to a broad portion of the campus (Geology 101 which serves 100 to 150 students per semester in multiple sections). Total enrollment in the program was 109 students as recently as 2015. It is assumed that current enrollment is at a low ebb and will recover quickly in the coming years. The undergraduate student enrollment is projected to grow from 45 to 120 students in the near future while the graduate program is projected to grow from 15 to 40 students. It is assumed that the current faculty count will be able to accommodate the expanded enrollment with little or no growth.

The total net square footage within the existing engineering complex that is dedicated to Geology and Geological Engineering is just over 32,000 nsf. While the department is projecting some growth and certain teaching labs need expansion, the right sizing of existing faculty office spaces creates a projection in net square footage that is actually less than the current totals.

SPACE PROJECTIONS <small>Net Square Feet (NSF)</small>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	6,129	6,519	1. Geology 101 Teaching Laboratory is enlarged and Prep Space added
RESEARCH LABORATORIES	4,773	5,136	2. Faculty offices are reduced from 11 spaces to 10 spaces and reduced in size
LABORATORY SUPPORT	6,719	4,184	3. Average existing faculty office space size of those identified is 362 square feet
LECTURE AND CLASSROOM	212	212	4. Grad Student / PhD Office space to accommodate 36 occupants (existing shown for approximately 18 occupants)
OFFICE AND ADMINISTRATION	8,214	6,492	
OTHER	6,016	6,016	
TOTAL	32,063	28,559	12% Decrease

PERSONNEL PROJECTIONS <small>C/O: On Campus/Online</small>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (c/o)	45 / -	120 / -	
MASTERS STUDENTS (c/o)	15 / -	40 / -	
PHD STUDENTS (c/o)	- / -	- / -	
FACULTY	10	10	
NSF PER STUDENT ON CAMPUS	541 NSF	197 NSF	

SPACE SUMMARY



Teaching Laboratories

Instruct / Res. Lab - Environmental Eng.	3B	304	1	304	304	0	533
Instruct / Res. Lab - Geomorphology	9	1,289	1	1,289	1,289	0	2,261
Instruct / Res. Lab - Geo Engineering	13	274	1	274	274	0	481
Instruct / Res. Lab - Hydrology	13A	274	1	274	274	0	481
Geology Computer Laboratory	108	849	1	849	849	0	1,489
Mineralogy Teaching Laboratory	201	921	1	921	921	0	1,616
Instruct / Res. Lab - Microscopy	210	875	1	875	875	0	1,535
Sedimentology Instructional Laboratory	212	1,062	1	1,452	1,452	390	2,547
Computer Teaching Laboratory	315	281	1	281	281	0	493



Research Laboratories

Research Lab - Geo Eng.	5	608	1	608	608	0	1,067
Geochemistry Research Laboratory	205	809	1	809	809	0	1,419
Mineralogy Research Laboratory	206	595	1	595	595	0	1,044
Paleontology Research & Teaching Laboratory	209	1,123	1	1,123	1,123	0	1,970
Geo Research Laboratory	301	280	1	280	280	0	491
Geo EARL Laboratory (Chem)	303A	459	1	459	459	0	805
Geo EARL Laboratory	303	243	1	243	243	0	426
Geo EARL Laboratory (office)	305	178	1	178	178	0	312
Research Lab	314A	230	1	230	230	0	404
Geo Research Laboratory	322A	248	1	248	248	0	435
Geology 101 Prep Lab	New	0	1	363	363	363	637



Laboratory Support

Geo Specimen Storage	1	376	0	376	0	-376	0
Field Equipment Storage	11	611	1	611	611	0	1,072
Storage / Shop	44	216	1	216	216	0	379
Geo & Geo Eng Storage	2A	457	0	457	0	-457	0
Geo & Geo Eng Storage	2B	125	0	125	0	-125	0
Geo & Geo Eng Storage	2C	130	0	130	0	-130	0
Geo & Geo Eng Storage	2D	170	0	170	0	-170	0
Geo & Geo Eng Storage	2E	115	0	115	0	-115	0
Rock Prep	3	258	1	258	258	0	453
Rock Prep Storage	3A	37	1	37	37	0	65
Hydrology Equipment	4	142	1	142	142	0	249
Rock Saw Room	9B	301	1	301	301	0	528
Geology Sample Recovery	9A	300	1	300	300	0	526
Geology Field Gear & Collections	15	617	1	617	617	0	1,082
Geo Collections	17	378	0	378	0	-378	0
Paleontology Collections	104	774	0	774	0	-774	0
Instructional Collections	106	274	0	274	0	-274	0
Paleontology Collections	208	1,056	0	1,056	0	-1,056	0
Prep Lab?	304	151	1	151	151	0	265
Prep Lab?	304A	118	1	118	118	0	207
Dark Room	316	113	1	113	113	0	198
High Density Specimen Storage	New	0	1	1,320	1,320	1,320	2,316



Lecture and Classroom

Instructional Recording Studio	308	212	1	212	212	0	372
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Office & Administrative

Department Chair Office	103	389	1	170	170	-219	298
Faculty Office	114	426	0	0	0	-426	0
Faculty Office	202	454	0	0	0	-454	0
Faculty Office	204	454	0	0	0	-454	0
Faculty Office	207	430	0	0	0	-430	0
Faculty Office	213	468	0	0	0	-468	0
Faculty Office	313	281	0	0	0	-281	0
Faculty Office	317	281	0	0	0	-281	0
Faculty Office	322B	254	0	0	0	-254	0
Faculty Office	322C	218	0	0	0	-218	0
Faculty Office	324	362	0	0	0	-362	0
Faculty Office	330A	329	0	0	0	-329	0
Faculty Office	New	0	10	120	1,200	1,200	2,105
Visiting Faculty Office	321	236	1	120	120	-116	211
Staff / Administrative Offices	101	564	1	564	564	0	989
Staff / Administrative Offices	101A	286	1	286	286	0	502
Staff / Administrative Offices	101B	143	1	143	143	0	251
Conference Room	105	446	1	446	446	0	782
Lab Director Office	300	165	1	120	120	-45	211
Faculty Lounge	306	269	1	269	269	0	472
Grad Student Offices	217	423	0	0	0	-423	0
Grad Student Offices (2)	309	178	0	0	0	-178	0
Grad Student Offices (2)	311	166	0	0	0	-166	0
Grad Student Offices (2)	312	114	0	0	0	-114	0
Grad Students (5)	319	281	0	0	0	-281	0
FD Holland Jr. Library - Dir. Office	326B	174	1	174	174	0	305
Grad Students / PhD Offices	New	0	36	80	2,880	2,880	5,053
Emeritus Faculty	113	423	1	120	120	-303	211



Other

Student Study Area	7	554	1	554	554	0	972
Storage / Library	314	233	1	233	233	0	409
Geo Break Area	318	274	1	274	274	0	481
FD Holland Jr. Geo Library	326	1,793	1	1,793	1,793	0	3,146
FD Holland Jr. Library - Workroom	326A	199	1	199	199	0	349
FD Holland Jr. Geo Library - Mezzanine - 1	326	1,297	1	1,297	1,297	0	2,275
FD Holland Jr. Geo Library - Mezzanine - 2	328	315	1	315	315	0	553
FD Holland Jr. Geo Library - Map Room - 1	328	848	1	848	848	0	1,488
FD Holland Jr. Geo Library - Map Room - 2	330	503	1	503	503	0	882

TOTALS

32,063

28,559

-3,504

50,104



CIVIL E

The tables below show the net square footage, enrollment and full-time faculty numbers for both the current and future state associated within the Civil Engineering department to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve the department.

CIVIL ENGINEERING
DEPARTMENT SUMMARY





The Civil Engineering Department is primarily housed in Upson I and Upson II Halls. The current enrollment in this program has a significant on-line student component and includes 342 undergraduate students (89 on-campus; 253 on-line), 15 master's students and 7 PhD candidates with 7 full-time faculty positions. The enrollment is projected to grow to 360 undergraduate students (one-half on-line), 30 master's students and up to 20 PhD candidates. This enrollment growth will also lead to a full time faculty demand of 12 positions in an effort to improve the faculty to student ratio.


The total net square footage within the existing engineering complex that is dedicated to Civil Engineering is just over 14,000 nsf. The department has identified the need for additional conventional and high bay laboratory space to accommodate new initiatives in teaching and research centered around structural aging and assessment as well as student projects.

SPACE PROJECTIONS <small>Net Square Feet (NSF)</small>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	6,872	6,872	<div>1. Addition of 3 major research laboratory spaces:<ul style="list-style-type: none">• High Bay Research Lab• Small Scale Bridge Laboratory• MICA (Modern Infrastructure Condition Assessment) Laboratory</div> <div>2. Faculty Office count grows from 9 to 12</div> <div>3. Grad Student / PhD Office space to accommodate 16 occupants (existing shown for approximately 12 occupants)</div>
RESEARCH LABORATORIES	1,340	8,712	
LABORATORY SUPPORT	3,139	3,139	
LECTURE AND CLASSROOM	-	-	
OFFICE AND ADMINISTRATION	2,517	3,312	
OTHER	505	505	
TOTAL	14,373	22,540	56% Increase

PERSONNEL PROJECTIONS <small>C/O: On Campus/Online</small>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (C/O)	89 / 253	180 / 360	
MASTERS STUDENTS (C/O)	15 / -	30 / -	
PHD STUDENTS (C/O)	6 / 1	20 / 4	
FACULTY	7	12	
NSF PER STUDENT ON CAMPUS	130 NSF	97 NSF	

SPACE SUMMARY

	Teaching Laboratories								
	Concrete and Asphalt Laboratory	112	3,130	1	3,130	3,130	0	5,491	
	Steel and Concrete Laboratory	113	3,342	1	3,342	3,342	0	5,863	
	Computational Laboratory	215	400	1	400	400	0	702	
	Research Laboratories								
	Environmental Engineering Lab 1	362	734	1	726	726	-8	1,274	
	Environmental Engineering Lab 2	363	606	1	726	726	120	1,274	
	Industrial Research Laboratory	New	0	1	2,904	2,904	2,904	5,095	
	Bridge Lab	New	0	1	1,452	1,452	1,452	2,547	
	MICA Laboratory	New	0	1	2,904	2,904	2,904	5,095	
	Laboratory Support								
	Basement Storage	2	370	1	370	370	0	649	
	Basement Storage	3	370	1	370	370	0	649	
	Basement Pump Room	18	380	1	380	380	0	667	
	Equipment Storage	100A	141	1	141	141	0	247	
	Surveying Equipment	106I	155	1	155	155	0	272	
	Asphalt Binding Room	106H	261	1	261	261	0	458	
	Water Sampling Equipment	106F	41	1	41	41	0	72	
	Curing Room	112A	103	1	103	103	0	181	
	Equipment Room	112B	101	1	101	101	0	177	
	Storage Room	112C	156	1	156	156	0	274	
	Storage Room	112D	101	1	101	101	0	177	
	Mezzanine	227	689	1	689	689	0	1,209	
	Lab Storage	363A	90	1	90	90	0	158	
	Lab Storage	363B	104	1	104	104	0	182	
	Prep Lab	364	77	1	77	77	0	135	
		Office & Administrative							
		Department Chair Civil E	260P	120	1	170	170	50	298
		Faculty Office	260A	157	0	0	0	-157	0
Faculty Office		260B	110	0	0	0	-110	0	
Faculty Office		260C	108	0	0	0	-108	0	
Faculty Office		260D	120	0	0	0	-120	0	
Faculty Office		260E	105	0	0	0	-105	0	
Faculty Office		260J	164	0	0	0	-164	0	
Faculty Office		260K	108	0	0	0	-108	0	
Faculty Office		260L	96	0	0	0	-96	0	
Faculty Office		260M	108	0	0	0	-108	0	
Faculty Office		New	0	12	120	1,440	1,440	2,526	
CE Reception Area		260	203	1	203	203	0	356	
Conference Room		260F	183	1	183	183	0	321	
Mail Room		260G	36	1	36	36	0	63	

	ROOM #	EXISTING NSF	PROPOSED QTY	NSF EACH	PROPOSED NSF	NSF DIFF.	PROPOSED GSF
Grad Students	205	70	0	0	0	-70	0
Grad Students	211	72	0	0	0	-72	0
Grad Students	213	72	0	0	0	-72	0
Grad Students	214	70	0	0	0	-70	0
Grad Students	223	229	0	0	0	-229	0
Grad Students	361	386	0	0	0	-386	0
Grad Students / PhD Offices	New	0	16	80	1,280	1,280	2,246
<div></div> <div>Other</div>							
	CE Commons / Student Groups	216	505	1	505	505	0
TOTALS		14,373			22,540	8,167	39,544



CHEM E

The tables below show the net square footage, enrollment and full-time faculty numbers for both the current and future state associated within the Chemical Engineering department to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve the department.

CHEMICAL ENGINEERING DEPARTMENT SUMMARY

The Chemical Engineering Department is primarily housed in Harrington Hall and Upson II. The current enrollment in this program has a significant on-line student component and includes 235 undergraduate students (110 on-campus; 125 on-line), 15 master's students (one-half on-line) and 15 PhD candidates (one-half on-line) with 7 full-time faculty positions. The enrollment is projected to grow to 400 undergraduate students (one-half on-line), 24 master's students (one-half on-line) and up to 24 PhD candidates (one-half on-line). This enrollment growth will also lead to a full time faculty demand of 12 positions in an effort to improve the faculty to student ratio to a target value of 25:1.

The total net square footage within the existing engineering complex that is dedicated to Chemical Engineering is just over 15,000 nsf. The department has identified the need for additional wet chemistry research and teaching laboratory space as well as a consolidation and modernization of unit operations instruction laboratories. The existing unit operations labs are located in the aging 3 story expansion on the east side of Harrington Hall and the area is in need of replacement to function efficiently and safely.

SPACE PROJECTIONS <small>Net Square Feet (NSF)</small>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	3,410	5,156	1. Expansion of Wet Chemistry Teaching Space
RESEARCH LABORATORIES	4,953	5,692	2. Consolidation and expansion of Unit Operations Teaching Laboratories
LABORATORY SUPPORT	2,426	3,188	3. Expansion of Wet Chemistry Research Laboratory Space
LECTURE AND CLASSROOM	-	-	4. Faculty Office count grows from 9 to 12
OFFICE AND ADMINISTRATION	3,654	6,886	5. Grad Student / PhD Office space to accommodate 48 occupants (existing shown for approximately 7 occupants)
OTHER	789	789	
TOTAL	15,232	21,711	42% Increase

PERSONNEL PROJECTIONS <small>C/O: On Campus/Online</small>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (c/o)	110 / 125	200 / 200	
MASTERS STUDENTS (c/o)	8 / 7	12 / 12	
PHD STUDENTS (c/o)	8 / 7	12 / 12	
FACULTY	7	12	
NSF PER STUDENT ON CAMPUS	120 NSF	91 NSF	

SPACE SUMMARY



Teaching Laboratories

Wet Chemistry Teaching Laboratory	304	332	2	726	1,452	1,120	2,547
Teaching Laboratory (Unit Ops 3)	316	334	0	0	0	-334	0
Computational Laboratory	320	800	1	800	800	0	1,404
Teaching Laboratory (Unit Ops 1)	321	794	1	1,089	1,089	295	1,911
Teaching Laboratory (Unit Ops 2)	360	1,150	0	0	0	-1,150	0
Unit Operations Teaching Laboratory	New	0	1	1,815	1,815	1,815	3,184



Research Laboratories

Pilot Scale Systems Research	100B	383	1	383	383	0	672
Chem E Research	160	2,244	1	2,178	2,178	-66	3,821
Wet Chemistry Research	260	1,190	1	1,815	1,815	625	3,184
Hoffman Energetics Laboratory	322B	107	1	107	107	0	188
Research Laboratory	360B	243	1	363	363	120	637
Research Laboratory	360C	238	1	363	363	125	637
Research Laboratory	360E	428	1	363	363	-65	637
Electrolysis Laboratory	362A	120	1	120	120	0	211



Laboratory Support

Chem E Shop / Tool Storage	160A	403	1	484	484	81	849
Fittings and Material Storage	160B	240	1	242	242	2	425
Chem E Shop Storage	160C	83	1	121	121	38	212
Chemistry Prep	260B	240	1	242	242	2	425
Instrumentation Laboratory	260C	220	1	242	242	22	425
Instrumentation Laboratory	261	350	1	363	363	13	637
Storage	322A	42	1	42	42	0	74
Teaching Lab Prep	360A	164	1	242	242	78	425
Glassware Prep / Chemical Storage	360D	160	1	363	363	203	637
Flue Mezzanine	360F	140	1	242	242	102	425
Chemical Storage	360G	283	1	363	363	80	637
Chemical Storage	360H	101	1	242	242	141	425



Office & Administrative

Department Chair Chem E	365B	120	1	170	170	50	298
Faculty Office	305	156	0	0	0	-156	0
Faculty Office	307	161	0	0	0	-161	0
Faculty Office	313	168	0	0	0	-168	0
Faculty Office	314	159	0	0	0	-159	0
Faculty Office	315	151	0	0	0	-151	0
Faculty Office	365C	126	0	0	0	-126	0
Faculty Office	365D	126	0	0	0	-126	0
Faculty Office	365E	126	0	0	0	-126	0
Faculty Office	New	0	11	120	1,320	1,320	2,316
Lab Manager's Office	260A	164	1	120	120	-44	211

Department Office	365	499	1	499	499	0	875
Conference Room	325	144	1	144	144	0	253
Mail Room	365A	101	1	101	101	0	177
Grad Students	223	229	0	0	0	-229	0
Faculty Office	308	156	0	0	0	-156	0
Grad Students	312	159	0	0	0	-159	0
Grad Students	322C	118	0	0	0	-118	0
Grad Students	322D	99	0	0	0	-99	0
Grad Students / PhD Offices	New	0	48	80	3,840	3,840	6,737
Break Room	306	161	1	161	161	0	282
Student Lounge	318	531	1	531	531	0	932
Other							
Storage	1	236	1	236	236	0	414
Storage	3	238	1	238	238	0	418
Unused	323	140	1	140	140	0	246
Unused	323A	175	1	175	175	0	307



TOTALS		15,232			21,711	6,479	38,089
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EE&CS

The tables below show the net square footage, enrollment and full-time faculty numbers for both the current and future state associated within the Electrical Engineering and Computer Science department to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve the department.

ELECTRICAL ENGINEERING + COMPUTER SCIENCE DEPARTMENT SUMMARY

The Electrical Engineering and Computer Science Department is primarily housed in Harrington Hall and Upson II, but also includes two computational labs in Leonard Hall on the opposite side of the complex. The department supports undergraduate and graduate/PhD majors in several areas including electrical engineering, computer science, data science and cyber security. At present, it also includes bio-medical engineering, but the current plan is for that program to become a stand-alone department (see section on Bio-medical Engineering later in this document). Current enrollment within the department includes 520 undergraduate students and approximately 130 students in various graduate/PhD programs and a current full-time faculty count of 18. The enrollment in EE/CS is projected to grow by approximately 50% in the next 10 years to numbers approaching 750 undergraduate students and 190 students in the graduate and PhD programs with a full-time faculty goal of 30.

The total net square footage within the existing engineering complex that is dedicated to Electrical Engineering and Computer Science is just under 14,000 nsf. The department has identified the need for expanded instructional laboratory space a new computational research facility as well as additional office space for graduate and PhD candidates.

SPACE PROJECTIONS <small>Net Square Feet (NSF)</small>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	3,178	3,476	1. Consolidation and slight increase in Teaching Laboratory space
RESEARCH LABORATORIES	6,646	7,733	2. New Computational Research Laboratory
LABORATORY SUPPORT	209	209	3. Faculty Office count grows from 17 to 31
LECTURE AND CLASSROOM	-	-	4. Grad Student / PhD Office space to accommodate 40 occupants (existing shown for approximately 25 occupants)
OFFICE AND ADMINISTRATION	3,779	8,035	
OTHER	-	-	
TOTAL	13,812	19,453	21% Increase

PERSONNEL PROJECTIONS <small>C/O: On Campus/Online</small>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (c/o)	520 / -	520 / -	
MASTERS STUDENTS (c/o)	86 / -	125 / -	
PHD STUDENTS (c/o)	45 / -	65 / -	
FACULTY	18	30	
NSF PER STUDENT ON CAMPUS	24 NSF	21 NSF	

SPACE SUMMARY



Teaching Laboratories

EE&CS Teaching Laboratory	110	842	0	0	0	-842	0
EE&CS Teaching Laboratory	112	837	0	0	0	-837	0
EE&CS Teaching Laboratory	New	0	1	1,815	1,815	1,815	3,184
EE&CS Embedded Systems Teaching Lab	120C	572	1	572	572	0	1,004
EE&CS Undergraduate Teaching Lab	220	506	0	0	0	-506	0
EE&CS Circuits & Power Teaching Lab	222	421	0	0	0	-421	0
EE&CS Circuits & Power Teaching Lab	New	0	1	1,089	1,089	1,089	1,911



Research Laboratories

EE&CS Research Laboratory	100H	461	1	461	461	0	809
Power and Energy Research Laboratory	109	734	1	734	734	0	1,288
EE&CS Research Laboratory	112	333	1	333	333	0	584
EE&CS Research Laboratory	113	391	1	391	391	0	686
EE&CS Maker Space	120	2,219	1	2,178	2,178	-41	3,821
EE&CS Research Laboratory	120A	406	1	363	363	-43	637
EE&CS Research Laboratory	120F	434	1	363	363	-71	637
EE&CS Research Laboratory	126	573	1	726	726	153	1,274
EE&CS Research Laboratory	211	153	1	153	153	0	268
EE&CS Research Laboratory	212	177	1	177	177	0	311
EE & CS Computer Laboratory	123	442	1	442	442	0	775
Senior Design Lab	213	323	1	323	323	0	567
Computational Research Laboratory	New	0	1	1,089	1,089	1,089	1,911



Laboratory Support

EE & CS Maker Space Support	120B	209	1	209	209	0	367
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Office & Administrative

Department Chair Office	366B	269	1	170	170	-99	298
Faculty Office	160I	96	0	0	0	-96	0
Faculty Office	160L	107	0	0	0	-107	0
Faculty Office	366A	125	0	0	0	-125	0
Faculty Office	366C	107	0	0	0	-107	0
Faculty Office	366D	107	0	0	0	-107	0
Faculty Office	366E	117	0	0	0	-117	0
Faculty Office	366G	107	0	0	0	-107	0
Faculty Office	366H	110	0	0	0	-110	0
Faculty Office	366J	110	0	0	0	-110	0
Faculty Office	366K	110	0	0	0	-110	0
Faculty Office	366L	110	0	0	0	-110	0
Faculty Office	366M	110	0	0	0	-110	0
Faculty Office	366N	118	0	0	0	-118	0
Faculty Office	366P	106	0	0	0	-106	0
Faculty Office	366Q	110	0	0	0	-110	0

Faculty Office	366R	130	0	0	0	-130	0
Faculty Office	369	107	0	0	0	-107	0
Faculty Office	New	0	30	120	3,600	3,600	6,316
EE&CS Reception Area	366	270	1	270	270	0	474
Conference Space	160F	183	1	183	183	0	321
Copy Room	366F	120	1	120	120	0	211
GTA Office	120D	319	1	319	319	0	560
Grad Student Offices	205	176	0	176	0	-176	0
Grad Student Offices	206	153	0	153	0	-153	0
Grad Student Offices	223	229	0	229	0	-229	0
Grad Students / PhD Offices	New	0	40	80	3,200	3,200	5,614
Storage	366S	173	1	173	173	0	304

TOTALS		13,812			19,453	5,641	34,128
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IES

The tables below show the net square footage, enrollment, faculty and research staff numbers for both the current and future state associated within the Institute for Energy Studies to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve the department.

INSTITUTE FOR ENERGY STUDIES
DEPARTMENT SUMMARY




The Institute for Energy Studies is housed entirely in the Collaborative Energy Center. It differs significantly from most other departments within the college. Founded in 2010, it is a department that focuses on grant funded research and hosts graduate level programs in energy engineering and environmental engineering. Current research focus areas are in carbon capture, rare earth metals mining and energy storage. The department employs a single full-time faculty member and a research and grant writing staff of 12. In addition, the institute regularly employs graduate and undergraduate students from other departments to assist with its research initiatives. The enrollment of students pursuing graduate degrees within the institute is expected to grow to as much as 50 in Master's and PhD programs. In addition, the institute expects to grow its resident research staff to 20 in the future.

The total net square footage currently assigned to the institute is just over 7,000 nsf and includes office space, flexible research laboratories and a research high bay space. Being located in the Collaborative Energy Center, all the space assigned to the institute is relatively new.

SPACE PROJECTIONS <small>Net Square Feet (NSF)</small>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	-	-	1. Increase in Equipment Test High-Bay Research space
RESEARCH LABORATORIES	2,355	2,918	2. Increase in Fabrication Bay space
LABORATORY SUPPORT	2,013	2,367	3. Staff Office count grows from 7 to 20 (includes office space for new Instructor and Grant Writer positions)
LECTURE AND CLASSROOM	-	-	4. Grad Student / PhD Office space to accommodate 26 occupants (existing shown for approximately 20 occupants)
OFFICE AND ADMINISTRATION	2,748	4,650	
OTHER	-	-	
TOTAL	7,116	9,935	39% Increase

PERSONNEL PROJECTIONS <small>C/O: On Campus/Online</small>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (C/O)	- / -	- / -	
MASTERS STUDENTS (C/O)	18 / 17	9 / 9	
PHD STUDENTS (C/O)	- / -	25 / 7	
FACULTY	1 / 12	1 / 20	
NSF PER STUDENT ON CAMPUS	395 NSF	292 NSF	

SPACE SUMMARY

	Research Laboratories							
	IES High Bay Equip. Test Laboratory	134	982	1	982	982	0	1,723
	IES High Bay Equip. Test Laboratory (Mezz)	234	526	1	1,089	1,089	563	1,911
	IES Wet Laboratory	240	847	1	847	847	0	1,486
	Laboratory Support							
	IES Receiving and Loading	130	542	1	542	542	0	951
	Air Compressor	130A	52	1	52	52	0	91
	Storage	130B	31	1	31	31	0	54
	IES Fabrication Bay	132	735	1	1,089	1,089	354	1,911
	IES Sample Processing	136	289	1	289	289	0	507
	IES Research Control Room	236	364	1	364	364	0	639
	Office & Administrative							
	IES Department Chair Office	246A	179	1	170	170	-9	298
	IES Instructor's Office	New	0	1	120	120	120	211
	IES Grant Writer's Office	New	0	1	120	120	120	211
	IES Staff Office	246B	120	0	0	0	-120	0
	IES Staff Office	246C	120	0	0	0	-120	0
	IES Staff Office	246D	196	0	0	0	-196	0
	IES Staff Office	246E	119	0	0	0	-119	0
	IES Staff Office	246F	119	0	0	0	-119	0
	IES Staff Office	246G	119	0	0	0	-119	0
	IES Staff Office	246H	119	0	0	0	-119	0
	IES Staff Office	New	0	18	120	2,160	2,160	3,789
	Grad Student Cubicles	246	1,657	0	0	0	-1,657	0
	Grad Students / PhD Offices	New	0	26	80	2,080	2,080	3,649
TOTALS			7,116			9,935	2,819	17,430



MECH E

MECHANICAL ENGINEERING DEPARTMENT SUMMARY

The Mechanical Engineering Department is primarily housed in Upson I and Upson II Halls. The current enrollment in this program has a significant on-line student component and includes 620 undergraduate students (one-half on-line), 26 master's students (one-half on-line) and 11 PhD candidates with 14 full-time faculty positions. The enrollment is projected to grow to 800 undergraduate students (one-half on-line), 36 master's students and up to 16 PhD candidates. This enrollment growth will also lead to a full time faculty demand of 21 positions.

The total net square footage within the existing engineering complex that is dedicated to Mechanical Engineering is over 27,000 nsf. The department has identified the need for additional space to accommodate heavy equipment and machine space in support of its existing high bay labs and the addition of a dedicated freshman research projects laboratory.

The tables below show the net square footage, enrollment and full-time faculty numbers for both the current and future state associated within the Mechanical Engineering department to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve the department.

SPACE PROJECTIONS <i>Net Square Feet (NSF)</i>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	3,111	4,968	1. Expansion of High-Bay Instructional Machine Shop space
RESEARCH LABORATORIES	12,390	16,414	2. Increase in Freshman Projects Research Laboratory space
LABORATORY SUPPORT	7,542	8,290	3. Increase in High-Bay Machine Shop space
LECTURE AND CLASSROOM	-	-	4. Increase in Welding Shop space
OFFICE AND ADMINISTRATION	4,574	5,764	5. Faculty office count grows from 16 to 20
OTHER	-	-	6. Grad Student / PhD Office space to accommodate 32 occupants (existing shown for approximately 22 occupants)
TOTAL	27,617	35,436	28% Increase

PERSONNEL PROJECTIONS <i>C/O: On Campus/Online</i>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (c/o)	310 / 310	400 / 400	
MASTERS STUDENTS (c/o)	13 / 13	18 / 18	
PHD STUDENTS (c/o)	10 / 1	14 / 2	
FACULTY	14	21	
NSF PER STUDENT ON CAMPUS	82 NSF	83 NSF	

SPACE SUMMARY



Teaching Laboratories

ME Instructional Measurement Lab	221	931	1	1,089	1,089	158	1,911
ME Computational Laboratory	264	510	1	510	510	0	895
ME Instructional Machine Shop new	New	0	1	1,699	1,699	1,699	2,981
ME Instructional Machine Shop exg	102	1,568	1	1,568	1,568	0	2,751
ME Recording Room	280	102	1	102	102	0	179



Research Laboratories

ME Research Laboratory (hi-temp/manuf)	12D	1,310	1	1,310	1,310	0	2,298
ME Faculty Research Laboratory	100	2,015	1	2,015	2,015	0	3,535
ME Freshman Projects	101	470	1	726	726	256	1,274
ME Student Projects Laboratory	New	0	1	1,815	1,815	1,815	3,184
Laser Laboratory	105B	426	1	660	660	234	1,158
ME Undergraduate Robotics Lab	106A	366	1	366	366	0	642
ME Faculty Research Laboratory	106C	260	1	260	260	0	456
ME Formula Car Cage	114A	1,110	1	1,110	1,110	0	1,947
ME Student Projects Research Laboratory	114	1,741	1	1,741	1,741	0	3,054
ME Faculty Research Laboratory	115	360	1	360	360	0	632
ME Machine Shop new	New	0	1	1,719	1,719	1,719	3,016
ME Machine Shop exg	104	1,911	1	1,911	1,911	0	3,353
Machine Vision Laboratory	200	357	1	357	357	0	626
Machine Vision Laboratory	200A	105	1	105	105	0	184
Mechanical Testing Laboratory	201A	667	1	667	667	0	1,170
ME Faculty Research Laboratory	201C	368	1	368	368	0	646
Senior Design Lab	213	323	1	323	323	0	567
ME Faculty Research Laboratory	217	220	1	220	220	0	386
ME Faculty Research Laboratory	219	381	1	381	381	0	668



Laboratory Support

Chemical Storage	12E	108	1	108	108	0	189
Electrical Equipment	12A	135	1	135	135	0	237
Machining Shop	12B	135	1	135	135	0	237
Storage	2	370	1	370	370	0	649
Storage	3	370	1	370	370	0	649
ME 3D Printing	100C	207	1	207	207	0	363
ME High Bay Support	102A	246	1	246	246	0	432
Welding Shop	105	1,232	1	1,980	1,980	748	3,474
Welding Supply	105A	126	1	126	126	0	221
ME Storage / Dock Area	106	2,285	1	2,285	2,285	0	4,009
ME Foundry	106D	332	1	332	332	0	582
Storage	106E	139	1	139	139	0	244
Storage	106G	181	1	181	181	0	318
ME Foundry Support	106K	71	1	71	71	0	125

Storage	106M	187	1	187	187	0	328
Secure Storage	106B	150	1	150	150	0	263
ME Wood Shop	111	479	1	479	479	0	840
ME Vibration Equipment Cage	114B	395	1	395	395	0	693
ME 3D Printing	201	394	1	394	394	0	691
Office & Administrative							
ME Department Chair	270	108	1	170	170	62	298
Faculty Offices	160A	157	0	0	0	-157	0
Faculty Offices	160B	108	0	0	0	-108	0
Faculty Offices	160C	108	0	0	0	-108	0
Faculty Offices	160D	120	0	0	0	-120	0
Faculty Offices	160E	105	0	0	0	-105	0
Faculty Offices	220	260	0	0	0	-260	0
Faculty Offices	266A	126	0	0	0	-126	0
Faculty Offices	266B	100	0	0	0	-100	0
Faculty Offices	267	208	0	0	0	-208	0
Faculty Offices	268	127	0	0	0	-127	0
Faculty Offices	269	129	0	0	0	-129	0
Faculty Offices	271	110	0	0	0	-110	0
Faculty Offices	272	88	0	0	0	-88	0
Faculty Offices	273	108	0	0	0	-108	0
Faculty Offices	274	109	0	0	0	-109	0
Faculty Offices	275	129	0	0	0	-129	0
Faculty Offices	New	0	20	120	2,400	2,400	4,211
Lab Manager's Office	106L	110	1	120	120	10	211
ME Department Office	266	258	1	258	258	0	453
ME Conference Room	278	256	1	256	256	0	449
Grad Student Offices	200B	405	0	0	0	-405	0
Grad Student Offices	200C	111	0	0	0	-111	0
Grad Student Offices	200D	108	0	0	0	-108	0
Grad Student Offices	202	68	0	0	0	-68	0
Grad Student Offices	206	72	0	0	0	-72	0
Grad Student Offices	207	70	0	0	0	-70	0
Grad Student Offices	208	72	0	0	0	-72	0
Grad Student Offices	209	70	0	0	0	-70	0
Grad Student Offices	210	72	0	0	0	-72	0
Grad Student Offices	212	70	0	0	0	-70	0
Graduate Student Cubicles	12	632	0	0	0	-632	0
Grad Students / PhD Offices	New	0	32	80	2,560	2,560	4,491

TOTALS		27,617			35,436	7,819	62,168
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BIO E

The tables below show the net square footage, enrollment and full-time faculty numbers for both the current and future state associated within the Biomedical Engineering department to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve the department.

BIOMEDICAL ENGINEERING
DEPARTMENT SUMMARY





The Biomedical Engineering Department is entirely housed in the basement of Upson II. This program has only recently been established as a stand-alone program and at this time only offers graduate degrees. The current enrollment in this program includes 35 graduate students (17 on-line) and a full-time faculty count of 1.75 through joint appointments. In the near future, the department plans to create an undergraduate program accommodating 100 students and to grow its graduate program to 60 student (projecting on-half of those to be on-line). The department expects the faculty count under this enrollment to reach 7 full-time positions.

The total net square footage within the existing engineering complex that is dedicated to Biomedical Engineering is approximately 2,600 nsf. The future needs of the department include expansion of teaching laboratory space as well as significant growth in research space for wet lab, optics and exercise research.

SPACE PROJECTIONS	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
Net Square Feet (NSF)			
TEACHING LABORATORIES	206	1,452	1. Expansion of Teaching Laboratory
RESEARCH LABORATORIES	924	4,356	2. Expansion of Research Laboratory Space
LABORATORY SUPPORT	152	484	3. Creation of Laboratory Space for:
LECTURE AND CLASSROOM	-	-	• Wet Chemistry
OFFICE AND ADMINISTRATION	1,388	3,410	• Optics
OTHER	-	-	• Exercise
TOTAL	2,670	9,702	• Faculty office count grows from 1 to 7
			4. Grad Student / PhD Office space to accommodate 30
			360% Increase

PERSONNEL PROJECTIONS	CURRENT	FUTURE	NOTES
C/O: On Campus/Online			
UNDERGRADUATE STUDENTS (c/o)	- / -	100 / -	
MASTERS STUDENTS (c/o)	13 / 17	60 / 30	
PHD STUDENTS (c/o)	- / -	- / -	
FACULTY	1.75	7	
NSF PER STUDENT ON CAMPUS	76 NSF	74 NSF	

SPACE SUMMARY

	Teaching Laboratories							
	Biomed Eng Teaching Laboratory	10	206	1	1,452	1,452	1,246	2,547
	Research Laboratories							
	Biomedical Engineering Laboratory	10A	924	1	1,815	1,815	891	3,184
	Biomedical Research Wet Laboratory	New	0	1	1,089	1,089	1,089	1,911
	Biomedical Optics Laboratory	New	0	1	726	726	726	1,274
	Biomedical Exercise Laboratory	New	0	1	726	726	726	1,274
	Laboratory Support							
	Biomed Lab Storage	10C	152	1	363	363	211	637
	Biomedical Secure Records Storage	New	0	1	121	121	121	212
	Office & Administrative							
	Department Chair Office	New	0	1	170	170	170	298
	Faculty Office	New	0	7	120	840	840	1,474
	Biomed E Office	11A	149	0	149	0	-149	0
	Biomed Eng Grad Office / Conference	11	1,111	0	1,111	0	-1,111	0
	Biomed PhD Office	10B	128	0	128	0	-128	0
	Grad Students / PhD Offices	New	0	30	80	2,400	2,400	4,211
TOTALS			2,670			9,702	7,032	17,021



COE

COLLEGE OF ENGINEERING
DEPARTMENT SUMMARY

In addition to the departmental space tabulations identified earlier, the college also possesses a significant amount of shared program space that includes the Dean's office and administration, core research labs, classrooms, student amenities, storage and the JODASS program. A moderate amount of growth associated with shared core space is anticipated. One of the primary shared research areas requested includes space to accommodate research by several departments involving the use of drones which is shown in the projected table.

The tables below show the net square footage numbers for both the current and future state associated within the core facilities of the College of Engineering and Mines to achieve the programmatic changes identified on the right. The tables on the following pages provide a listing of current and future space allocation throughout the complex to serve these needs.

SPACE PROJECTIONS <small>Net Square Feet (NSF)</small>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	1,153	1,153	1. New High-Bay Drone Laboratory (shared space requested by both Civil and EE/CS)
RESEARCH LABORATORIES	3,354	4,806	
LABORATORY SUPPORT	301	301	
LECTURE AND CLASSROOM	2,389	2,389	
OFFICE AND ADMINISTRATION	9,707	9,707	
OTHER	6,048	6,048	
TOTAL	22,952	24,404	6% Increase

PERSONNEL PROJECTIONS <small>C/O: On Campus/Online</small>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (C/O)	- / -	- / -	1. Space utilized by all departments inside the College of Engineering
MASTERS STUDENTS (C/O)	- / -	- / -	
PHD STUDENTS (C/O)	- / -	- / -	
FACULTY	- / -	- / -	
NSF PER STUDENT ON CAMPUS	- / -	- / -	

SPACE SUMMARY



Teaching Laboratories

Mezzanine Teaching Laboratory?

Research Laboratories

Core Imaging Laboratory

Undergraduate Computer Laboratory

Mezzanine Research Laboratory

CEM Computer Laboratory

Drone Laboratory



Laboratory Support

CEM Computer Lab Support

Imaging Prep Laboratory



Lecture and Classroom

Executive Training Room

Multi-Purpose Classroom

Multi-Purpose Classroom

General Classroom (COE)



Office & Administrative

COE Admin. - Reception

COE Admin. - Deans Office

COE Admin. - Assistants Office

COE Admin - Business Officer Office

COE- Admin Office

COE Dean's Conference Room

COE Admin - Support Specialist Office

COE Admin Office

COE Admin Office

COE Admin - Online Program Coord. Office

COE Admin - Online Program Support Office

COE Admin Office

COE Admin - Copy Room

COE Admin Office

COE Admin Office

COE Admin Grant Manager's Office

COE Admin. Grant Manager's Office

COE Admin. - Undergrad Program Coord. Office

COE Admin. - Grad Program Coord. Office

COE Admin. - Linux Administrators Office

COE Admin. -IT Coord. Office

Office - IT?

Office - IT?

COE Storage



COE Copy Room

Conference Room

AE2S Board Room

AE2S BR Storage

AE2S BR Coats

Reception Area (ME; EE&CS)

Jodsaas Center Lobby

Jodsaas Center Admin Office

Jodsaas Center Admin Office

Jodsaas Center Admin Office

Jodsaas Center Admin Office

Jodsaas Center Conference Room

Student Organization Office / Storage

Solberg Student Success Center

Kitchenette

Lounge - Kitchenette

Faculty Lounge



Other

Student Lounge

1st Floor Lobby / Museum (Leonard Hall)

Big Ideas Gym

Storage

Vending

Storage

Closet

Instructional Services Office?

COE Hall of Fame

Open Lounge

Student Study Space

Unknown

TOTALS



REG

REGISTRAR DEPARTMENT SUMMARY




The current engineering complex includes several teaching spaces that are centrally scheduled by the registrar and are regularly used by the various colleges within the university. These spaces include several medium and small classrooms as well as the main lecture hall at the northwest corner of Leonard Hall. Two of these existing classrooms located in Upson II are underutilized and are shown to be removed from the program.

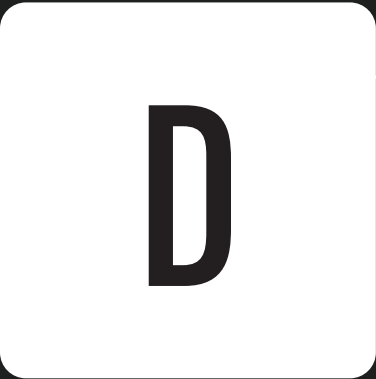
The tables below show the net square footage numbers for both the current and future state associated within the instructional spaces that are centrally scheduled by the Registrar.

SPACE PROJECTIONS <small>Net Square Feet (NSF)</small>	CURRENT NSF	FUTURE NSF	PROGRAMMATIC CHANGES
TEACHING LABORATORIES	2,477	2,477	1. Eliminate two small classrooms that are underutilized (161 & 164 Upson II)
RESEARCH LABORATORIES	-	-	
LABORATORY SUPPORT	-	-	
LECTURE AND CLASSROOM	11,756	10,860	
OFFICE AND ADMINISTRATION	-	-	
OTHER	129	50	6% Decrease
TOTAL	14,362	13,387	

PERSONNEL PROJECTIONS <small>C/O: On Campus/Online</small>	CURRENT	FUTURE	NOTES
UNDERGRADUATE STUDENTS (C/O)	- / -	- / -	1. Space utilized by all departments inside the College of Engineering
MASTERS STUDENTS (C/O)	- / -	- / -	
PHD STUDENTS (C/O)	- / -	- / -	
FACULTY	- / -	- / -	
NSF PER STUDENT ON CAMPUS	- / -	- / -	

SPACE SUMMARY

	Teaching Laboratories							
	Shared Teaching Laboratory / Classroom	107	847	1	847	847	0	1,486
	Shared Teaching Laboratory / Classroom	211	561	1	561	561	0	984
	Shared Teaching Laboratory / Classroom	215	1,069	1	1,069	1,069	0	1,875
	Lecture and Classroom							
	Lecture Hall	100	2,500	1	2,500	2,500	0	4,386
	Classroom	108	608	1	608	608	0	1,067
	Classroom	109	1,681	1	1,681	1,681	0	2,949
	Classroom	161	447	0	0	0	-447	0
	Classroom	164	449	0	0	0	-449	0
	Classroom	204	646	1	646	646	0	1,133
	Classroom	214	918	1	918	918	0	1,611
	Classroom (Interactive)	217	925	1	925	925	0	1,623
	Classroom	218	949	1	949	949	0	1,665
	Classroom (Interactive)	261	1,026	1	1,026	1,026	0	1,800
	Classroom	263	462	1	462	462	0	811
	Classroom	324	1,145	1	1,145	1,145	0	2,009
	Other							
	Projection Booth	100A	50	1	50	50	0	88
	Projection Booth	161A	43	0	0	0	-43	0
	Projection Booth	164A	36	0	0	0	-36	0
TOTALS			14,362			13,387	-975	23,486



CONCEPTUAL PLANNING

INTRODUCTION

The following pages illustrate the iterative conceptual design process that was engaged as the design team and building committee investigated various ways to make achieve the future facility scope.

CONCEPTUAL DESIGN

INTRODUCTION

Upon completion of the departmental interviews, an initial programmatic scope was established. The initial findings indicated an approximate need of 205,000 in overall net square footage to achieve the enrollment and faculty growth while also providing some additional programmatic space for new initiatives within the college. The existing engineering complex comprises approximately 159,400 net square feet. At the time, this calculation included the scope associated with the remote drill lab. Through the review process with the committee, it was decided that the remote drill lab should remain at its current site as access for the large equipment used there would prove to be difficult and potentially hazardous to maneuver through campus. Later on in the process, it was also decided that new teaching, research and office space should be created to expand the Biomedical Engineering operations as that program is planned in the immediate future to become a stand-alone department. As the program is now envisioned, the complex will need to include 202,355 net square feet and will accommodate space for teaching and research, faculty and grad student office accommodations, student amenities, and the addition of some spaces to respond to emerging initiatives in the engineering curriculum. There were also some reductions reflected in the overall net square footage including reduction in the size of some spaces and the elimination of some underutilized spaces such as old classrooms. Assuming a net to gross conversion of 57%, it was determined that the overall gross square footage to meet the future goals of the combined college of engineering and mines would need to be approximately 355,000 gross square feet. The detailed take off of the existing plans indicated that the current complex.

DESIGN CONSIDERATIONS

The aim of the design process centered around the goals and objectives established in the early kick-off meetings for the project. These concepts guided the design process once the program need was established and included the following major features.

ENROLLMENT: Expand enrollment with a focus on on-campus participation. The overall enrollment in the fall of 2020 was approximately 2,200 which included roughly 47% on-campus enrollment. The committee set the goal for on-campus enrollment at 1,500 to 2,000 over the next 10 to 15 years which would represent an approximate increase of between 45% and 93%. It is assumed that over the course of this time frame, on-line enrollment will continue to be in the 50% range of overall enrollment.

DEPARTMENTAL GROWTH: All departments expect steady growth well into the future which should be reflected in the goals of the facility maser plan. Mechanical Engineering is the largest program and that is expected to remain the case, but the fastest growing program is Electrical Engineering and Computer Science. Demand for Petroleum Engineering has fallen off in recent years, but moderate growth should be accommodated as future booms in the energy industry are anticipated. Biomedical Engineering will become it's own department in near future and should be poised for significant expansion. Civil Engineering is an important discipline in North Dakota and the college has determined that it is not meeting local demand. Civil Engineering is currently 75% on-line and that department has set a goal for improving that ratio to accommodate more students on-campus.

FOSTERING COLLABORATION: A proper balance between collaboration and departmental identity should be identified and be readily apparent in the solution. Faculty within departments should be located near one another to foster intra-departmental collaboration. Over the years, some of this co-location has become decentralized, but it has improved in recent years after the construction of the Collaborative Energy Center.

CELEBRATE THE UNIQUENESS OF UND ENGINEERING AND MINES: The college is small enough that students get to know one another and the faculty leading to collaboration and cross pollination. The solution should continue to foster and preserve this family like atmosphere and promote a sense of community. It should also celebrate that portion of the student body that is non-traditional with many students that are older and engaged in re-training.

RESEARCH SPACE: The facility should create an environment where resources are shared among all disciplines and across faculty and students with the goal of increasing undergraduate involvement in research initiatives.

RECRUITMENT AND RETENTION: The facility should be designed with recruitment in mind. The various disciplines within the college should be put on display to help with retention which has always been difficult in engineering, broadly. The entry procession into the complex should celebrate engineering and the vast number of career choices available with an engineering degree should be displayed.

INTERACTION WITH OTHER COLLEGES: The College of Engineering and specific departments within it regularly collaborate with other programs across campus. These collaborations are mostly based in research and will include interface with Aerospace Engineering, the Medical School, the department of Chemistry and the college of Business. The spaces created through the course of masterplan implementation should be situated to take advantage of these arrangements and future detailed designs should seek input from other campus entities that could benefit.

FACULTY: Current faculty count is 65 with a total staff of approximately 100. The faulty counts are too low leading to a poor faculty to student ratio which is close to 1:50 in some departments. This number should be closer to 1:30. A facility master plan should look at ways the faculty/student ratio can be improved over time by providing adequate space not only for faculty offices, but for shared research space to improve opportunities for faculty recruitment.

CLASSROOM SPACE: The masterplan should provide adequate conventional classroom space, but it should be sized appropriately (several existing registrar scheduled classrooms are too small to be effectively utilized). It should also take into account available classroom space in adjacent buildings in this region of campus and may include enclosed links between Harrington Hall and the Education Building to the north. The large lecture hall in Leonard Hall is widely used and needs to be preserved. Computer classrooms should also be planned that can be used for both instruction and student projects.

APPROACH

The original conceptual design approach included a series of massing studies that were investigated to achieve the following aims:

- Provide the addition of net and gross square footage to achieve the growth identified in the planning phase
- Provide new swing space sufficient to implement a partial phased renovation of the remaining areas of the complex.
- Create new dynamic space that would aid in recruitment and celebrate the engineering disciplines
- Improve way-finding and continuity
- Eliminate programmatic elements that were underused or determined to be unneeded in the future
- Correct spaces that were oversized

HYSLOP/STARCHER SITE

PROGRAMMATIC SCOPE

The new construction on the Hyslop / Starcher site is intended to provide new space for several major departments which will allow for the vacation of both Harrington and Upson II Halls by the College of Engineering. This new building will be designed to interface with a new STEM building wing that is in the initial study phases and is sized to accommodate the following programmatic departmental needs within the College of Engineering:

CIVIL ENGINEERING

- Teaching, research and high-bay spaces
- Faculty, staff and departmental offices
- Graduate student and post-doctoral office spaces
- Support and Storage Space

CHEMICAL ENGINEERING

- Teaching, research and unit ops spaces
- Faculty, staff and departmental offices
- Graduate student and post-doctoral office spaces
- Support and Storage Space

ELECTRICAL ENGINEERING & COMPUTER SCIENCE

- Teaching and research spaces
- Faculty, staff and departmental offices
- Graduate student and post-doctoral office spaces
- Support and Storage Space

MECHANICAL ENGINEERING

- Non-high bay teaching laboratories (currently located in the mezzanine of Upson I)
- General industrial and wet laboratory research spaces for faculty and students (currently located in the mezzanine of Upson I and the basement of Upson II)
- Faculty, staff and departmental offices
- Support and Storage Space

COLLEGE OF ENGINEERING

- Shared teaching and computational spaces
- Core Imaging and support laboratories
- Drone Lab
- Dean's office suite
- Conference space
- Faculty Lounge
- Note that several shared educational, research, office and building amenity spaces under this heading are currently located in Leonard & CEC would be slated to remain.

REGISTRAR

- Classroom spaces that are currently located in Upson II and Harrington will be recreated on the Hyslop site.

BIOMEDICAL ENGINEERING

- Teaching and research spaces
- Faculty, staff and departmental offices
- Graduate student and post-doctoral office spaces
- Support and Storage Space



- LEGEND
- Existing Building
 - College of Engineering & Mines Building
 - STEM Building
 - New UND Building
 - Building Slated for Demolition
 - Building Slated for Study
 - Skywalk
 - Hyslop/Starcher Site Boundary

SQUARE FOOTAGE TABULATION

The spaces and functions planned for the new construction are comprised of approximately 98,500 NSF with a total Gross square footage of approximately 179,130 GSF. The table on the following pages identifies all programmed spaces that are slated to be included in the new College of Engineering wing on the Hyslop / Starcher site.

SPACE SUMMARY

	ROOM #	EXISTING NSF	PROPOSED QTY	NSF EACH	PROPOSED NSF	NSF DIFF.	PROPOSED GSF
Petroleum Engineering		0			0	0	0
None	-	-	-	-	-	-	-
Geology & Geological Engineering		0			0	0	0
None	-	-	-	-	-	-	-
Civil Engineering		12,999			22,140	9,141	40,255
Concrete and Asphalt Laboratory	112	3,130	1	3,267	3,267	137	5,940
Steel and Concrete Laboratory	113	3,342	1	3,267	3,267	-75	5,940
Computational Laboratory	215	400	1	484	484	84	880
Environmental Engineering Lab 1	362	734	1	726	726	-8	1,320
Environmental Engineering Lab 2	363	606	1	726	726	120	1,320
Industrial Research Laboratory	New	0	1	2,904	2,904	2,904	5,280
Bridge Lab	New	0	1	1,452	1,452	1,452	2,640
MICA Laboratory	New	0	1	2,904	2,904	2,904	5,280
Bulk Storage	2	640	1	726	726	86	1,320
Equipment Storage	100A	141	2	121	242	101	440
Surveying Equipment	106I	155	1	121	121	-34	220
Asphalt Binding Room	106H	261	1	363	363	102	660
Water Sampling Equipment	106F	41	1	121	121	80	220
Curing Room	112A	103	1	121	121	18	220
Storage Room	112C	257	1	363	363	106	660
Lab Storage	363A	90	1	242	242	152	440
Prep Lab	364	77	1	121	121	44	220
Department Chair Civil E	260P	120	1	170	170	50	309
Faculty Office	Multi.	1,076	12	120	1,440	364	2,618
CE Reception Area	260	203	1	300	300	97	545
Conference Room	260F	183	1	200	200	17	364
Mail Room	260G	36	1	100	100	64	182
Grad Students / PhD Offices	Multi.	899	16	80	1,280	381	2,327
CE Commons / Student Groups	216	505	1	500	500	-5	909
Chemical Engineering		13,584			22,501	8,917	40,911
Wet Chemistry Teaching Laboratory	304	332	2	726	1,452	1,120	2,640
Computational Laboratory	320	800	1	726	726	-74	1,320
Teaching Laboratory (Unit Ops 1)	321	794	1	1,089	1,089	295	1,980
Unit Operations Teaching Laboratory	New	0	1	1,815	1,815	1,815	3,300
Pilot Scale Systems Research	100B	383	1	383	383	0	696
Chem E Research	160	2,244	1	2,178	2,178	-66	3,960
Wet Chemistry Research	260	1,190	1	1,815	1,815	625	3,300
Hoffman Energetics Laboratory	322B	107	1	242	242	135	440
Research Laboratory	360B	243	1	363	363	120	660
Research Laboratory	360C	238	1	363	363	125	660
Research Laboratory	360E	428	1	363	363	-65	660

	ROOM #	EXISTING NSF	PROPOSED QTY	NSF EACH	PROPOSED NSF	NSF DIFF.	PROPOSED GSF
Electrolysis Laboratory	362A	120	1	121	121	1	220
Chem E Shop / Tool Storage	160A	403	1	484	484	81	880
Fittings and Material Storage	160B	240	1	242	242	2	440
Chem E Shop Storage	160C	83	1	121	121	38	220
Chemistry Prep	260B	240	1	242	242	2	440
Instrumentation Laboratory	260C	220	1	363	363	143	660
Instrumentation Laboratory	261	350	1	363	363	13	660
Teaching Lab Prep	360A	164	1	242	242	78	440
Glassware Prep / Chemical Storage	360D	160	1	363	363	203	660
Flue	360F	140	3	242	726	586	1,320
Chemical Storage	360G	283	1	363	363	80	660
Chemical Storage	360H	101	1	242	242	141	440
Storage	322A	42	1	121	121	79	220
Department Chair Chem E	365B	120	1	170	170	50	309
Faculty Office	Multi.	1,329	11	120	1,320	-9	2,400
Department Office	365	499	1	300	300	-199	545
Conference Room	325	144	1	200	200	56	364
Mail Room	365A	101	1	100	100	-1	182
Grad Students / PhD Offices	Multi.	605	48	80	3,840	3,235	6,982
Break Room	306	161	1	200	200	39	364
Student Lounge	318	531	1	500	500	-31	909
Storage	Multi.	789	1	1,089	1,089	300	1,980
Electrical Engineering & Computer Science		13,306			20,354	7,048	37,007
EE&CS Teaching Laboratory	110&112	1,679	1	1,815	1,815	136	3,300
EE&CS Embedded Systems Teaching Lab	120C	572	1	726	726	154	1,320
EE&CS Circuits & Power Teaching Lab	222H	421	1	1,089	1,089	668	1,980
EE&CS Research Laboratory	100H	461	1	726	726	265	1,320
Power and Energy Research Laboratory	109	734	1	726	726	-8	1,320
EE&CS Research Laboratory	112	333	1	363	363	30	660
EE&CS Research Laboratory	113	391	1	363	363	-28	660
EE&CS Maker Space	120	2,219	1	2,178	2,178	-41	3,960
EE&CS Research Laboratory	120A	406	1	363	363	-43	660
EE&CS Research Laboratory	120F	434	1	363	363	-71	660
EE&CS Research Laboratory	126	573	1	726	726	153	1,320
EE&CS Research Laboratory	211	153	1	363	363	210	660
EE&CS Research Laboratory	212	177	1	363	363	186	660
EE & CS Computer Laboratory	123	442	1	726	726	284	1,320
Senior Design Lab	213	323	1	363	363	40	660
Computational Research Laboratory	New	0	1	1,089	1,089	1,089	1,980
EE & CS Maker Space Support	120B	209	1	242	242	33	440
Department Chair Office	366B	269	1	170	170	-99	309

SPACE SUMMARY

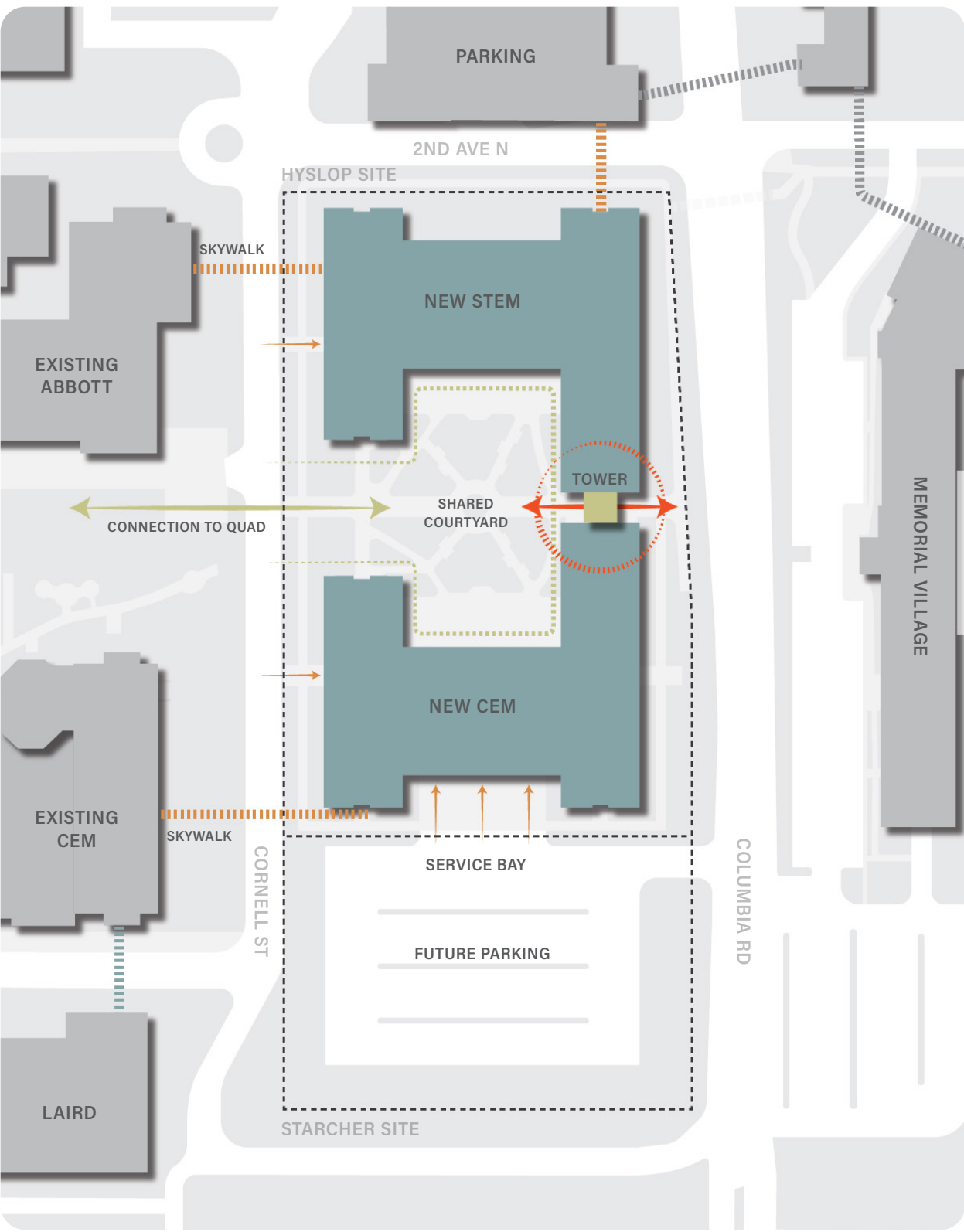
	ROOM #	EXISTING NSF	PROPOSED QTY	NSF EACH	PROPOSED NSF	NSF DIFF.	PROPOSED GSF
Faculty Office	Multi.	1,887	30	120	3,600	1,713	6,545
EE&CS Reception Area	366	270	1	300	300	30	545
Conference Space	160F	183	1	200	200	17	364
Copy Room	366F	120	1	100	100	-20	182
Grad Students / PhD Offices	Multi.	877	40	80	3,200	2,323	5,818
Storage	366S	173	1	200	200	27	364
Institute for Energy Studies		0			0	0	0
None	-	-	-	-	-	-	-
Mechanical Engineering		9,113			10,220	1,107	18,582
ME Instructional Measurement Lab	221	931	1	1,089	1,089	158	1,980
ME Computational Laboratory	264	510	1	726	726	216	1,320
ME Recording Room	280	102	1	100	100	-2	182
ME Reseach Laboratory (hi-temp/manuf)	12D	1,310	1	1,452	1,452	142	2,640
ME Faculty Research Laboratory	115	360	1	363	363	3	660
Machine Vision Laboratory	200	357	1	363	363	6	660
Mechanical Testing Laboratory	201A	667	1	726	726	59	1,320
ME Faculty Research Laboratory	201C	368	1	363	363	-5	660
Senior Design Lab	213	323	1	323	323	0	587
ME Faculty Research Laboratory	217	220	1	363	363	143	660
ME Faculty Research Laboratory	219	381	1	363	363	-18	660
Chemical Storage	12E	108	1	121	121	13	220
Electrical Equipment	12A	135	1	121	121	-14	220
Machining Shop	12B	135	1	121	121	-14	220
ME 3D Printing	201&100C	600	1	726	726	126	1,320
Faculty Offices	Multi.	2,092	20	120	2,400	308	4,364
ME Department Office	266	258	1	300	300	42	545
ME Conference Room	278	256	1	200	200	-56	364
College of Engineering		11,267			13,630	2,363	24,736
Teaching Laboratory	222U1	1,153	1	1,089	1,089	-64	1,980
Core Imaging Laboratory	16	1,029	1	1,089	1,089	60	1,980
Undergraduate Computer Laboratory	145	760	1	760	760	0	1,382
Research Laboratory	218U1	726	1	726	726	0	1,274
CEM Computer Laboratory	225	839	1	1,089	1,089	250	1,980
Drone Laboratory	New	0	1	1,452	1,452	1,452	2,640
CEM Computer Lab Support	225A	104	1	121	121	17	220
Imaging Prep Laboratory	17	197	1	242	242	45	440
COE Admin. - Reception	165	722	1	750	750	28	1,364
COE Admin. - Deans Office	165A	401	1	250	250	-151	455
COE Admin. - Assistants Office	165C	110	1	120	120	10	218
COE Admin - Business Officer Office	165D	143	1	120	120	-23	218
COE- Admin Office	165E	177	1	200	200	23	364

	ROOM #	EXISTING NSF	PROPOSED QTY	NSF EACH	PROPOSED NSF	NSF DIFF.	PROPOSED GSF
COE Dean's Conference Room	166	358	1	400	400	42	727
COE Admin - Support Specialist Office	103 CEC	558	1	600	600	42	1,091
COE Admin Office	103A	102	1	120	120	18	218
COE Admin Office	103C	102	1	120	120	18	218
COE Admin - Online Program Coord. Office	103D	111	1	120	120	9	218
COE Admin - Online Program Support Office	103E	103	1	120	120	17	218
COE Admin Office	103F	103	1	120	120	17	218
COE Admin - Copy Room	103G	251	1	250	250	-1	455
COE Admin Office	103H	113	1	120	120	7	218
COE Admin Office	103J	114	1	120	120	6	218
COE Admin Grant Manager's Office	160J	164	1	120	120	-44	218
COE Admin. Grant Manager's Office	160K	107	1	120	120	13	218
COE Admin. - Undergrad Program Coord. Office	160M	119	1	120	120	1	218
COE Admin. - Grad Program Coord. Office	160N	109	1	120	120	11	218
COE Admin. - Linux Administrators Office	162	152	1	200	200	48	364
COE Admin. -IT Coord. Office	162C	98	1	120	120	22	218
Office - IT	162A	107	1	120	120	13	218
Office - IT	162B	109	1	120	120	11	218
COE Storage	163	109	1	200	200	91	364
COE Copy Room	167	143	1	200	200	57	364
Conference Room	371	405	1	400	400	-5	727
Faculty Lounge	258	390	1	500	500	110	909
Storage	1	236	1	242	242	6	440
COE Hall of Fame	175 Upson I	393	1	600	600	207	1,091
Open Lounge	170	350	1	350	350	0	636
Registrar		0			0	0	0
None - Relocated to Leonard	-	-	-	-	-	-	-
Biomedical Engineering		1,282			9,702	8,420	17,640
Biomed Eng Teaching Laboratory	10	206	1	1,452	1,452	1,246	2,640
Biomedical Engineering Laboratory	10A	924	1	1,815	1,815	891	3,300
Biomedical Research Wet Laboratory	New	0	1	1,089	1,089	1,089	1,980
Biomedical Optics Laboratory	New	0	1	726	726	726	1,320
Biomedical Exercise Laboratory	New	0	1	726	726	726	1,320
Biomed Lab Storage	10C	152	1	363	363	211	660
Biomedical Secure Records Storage	New	0	1	121	121	121	220
Department Chair Office	New	0	1	170	170	170	309
Faculty Office	New	0	7	120	840	840	1,527
Grad Students / PhD Offices	New	0	30	80	2,400	2,400	4,364
TOTALS		61,551			98,547	36,996	179,130

BUILDING ORGANIZATION

Due to the overall square footage required on the new site for the College of Engineering and the integration with a STEM building that has yet to be defined, the design team has proposed a layout that includes two four story blocks separated by a large courtyard and that opens up to the west onto Cornell Street. Witmer Hall, on the west side of Cornell Street, is scheduled to be demolished once the STEM project on the Hyslop / Starcher site is completed. The courtyard opening to the west on the new project, combined with the demolition of Witmer Hall will create a new open quad in this of campus. The project also includes an iconic element in the form of a five-story tower as part of the connecting link between the new engineering addition and the STEM building along the eastern portion of the site. This tower element is proposed as a continuation of a similar aesthetic pursued in other areas of campus over the last several years in which an iconic tower structure has been incorporated into other new construction projects such as at the Memorial Student Union and Robin Hall. The tower element will provide a visual anchor at the west end of the new quad and will also create more iconic view of the campus for vehicular traffic approaching from the south along Columbia Road.

The high bay spaces programmed for the new construction will include instructional and industrial research high bay space for Civil and Chemical Engineering as well as a new Drone Laboratory to be shared among various departments. These high bay spaces are comprised of approximately 9,700 net square feet and are planned to be situated on the ground floor on the south side of the complex. The building has been located in such a way that it can be constructed before the demolition of Starcher Hall which must remain in use until the STEM building addition is completed along the north. Once Starcher has been demolished, the service yard serving the high bay spaces can be opened up for more efficient movement of materials and vehicles and can be used for expansion of surface parking in that area of the site.



Aesthetically, the new construction is designed to respond to it's context by utilizing complimentary brick and punched opening on the west sides of the two wings that lie across Cornel Street from Leonard Hall. The facades facing the quad can then open up to more curtain wall and glazed overhangs from within the courtyard between the engineering complex and the STEM building.

Mechanical penthouse space has been assumed on the 4th floors of both wings. These spaces are denoted in the rendering as raised portions for each wing to provide additional headroom for piping and ductwork as well as providing the potential for screening of exterior equipment such as exhaust fans and heat recovery equipment. It is assumed that all HVAC heating and cooling needs will be provided from the campus loop systems.





PHASED RENOVATION OF EXISTING STRUCTURES

PROGRAMMATIC SCOPE

Under the current program, sizable portions of the programmatic space for Petroleum Engineering, Geology and Geological Engineering, the Institute for Energy Studies and the Mechanical Engineering industrial high-bay spaces would remain in the existing areas of the complex. These structures to remain as College of Engineering spaces include Upson I Hall, The Collaborative Energy Complex and Leonard Hall. Targeted renovations and upgrades would take place in a subsequent phase (or phases) in these remaining areas of the complex as follows.

UPSON I RENOVATION SCOPE

In Upson I Hall, the existing Civil Engineering high bay space and non-high bay lab space for Mechanical Engineering teaching and research will be relocated to the new facility on the Hyslop /Starcher site. This will free up most of the mezzanine level and a large portion of the northeast high bay spaces to accommodate expanded programmatic areas shown below.

PETROLEUM ENGINEERING

- Expansion of existing PE Teaching Laboratory
- New laboratories for industry partners and PE research
- Graduate student and post-doctoral office spaces (to be relocated from the basement of Leonard to the mezzanine of Upson I)

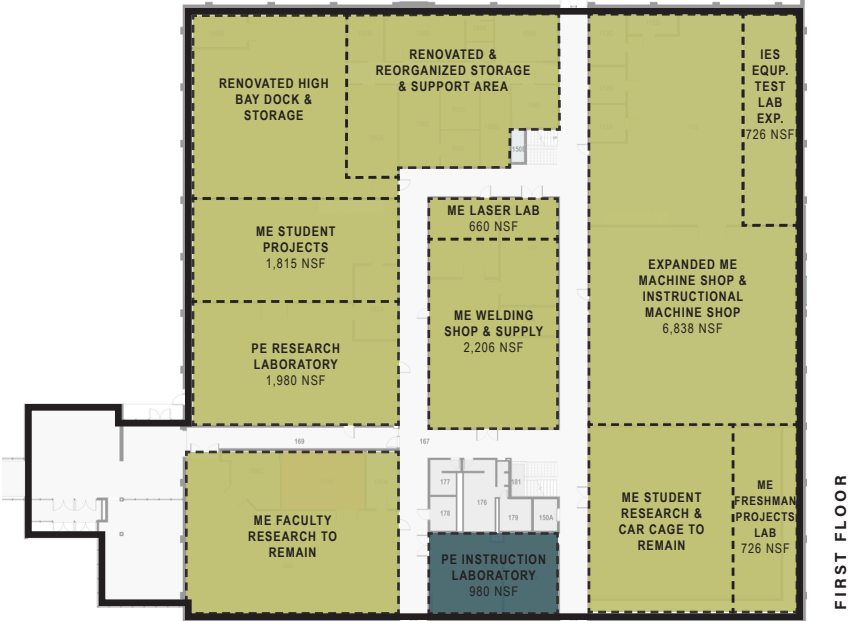
INSTITUTE FOR ENERGY STUDIES

- Expansion of IES Equipment Testing Laboratory

MECHANICAL ENGINEERING

- Moderate expansions of high-bay teaching and research labs
- Modernization of HVAC, electrical, plumbing and finishes for remaining high-bay labs
- Graduate student and post-doctoral office spaces (in the mezzanine of Upson I)

The spaces and functions planned for the renovation of Upson I are comprised of approximately 33,000 NSF. The table below identifies all programmed spaces that are slated to be included in the building. All new and expanded spaces shown in the program will be designed as part of a phased renovation that infills those areas that will have been vacated and moved to the new building completed in the earlier phase. The bulk of the expansion shown here will take place in the existing high bay space in the northeast portion of the ground floor high bay and on the mezzanine level.



DEPARTMENT BREAKOUT LEGEND

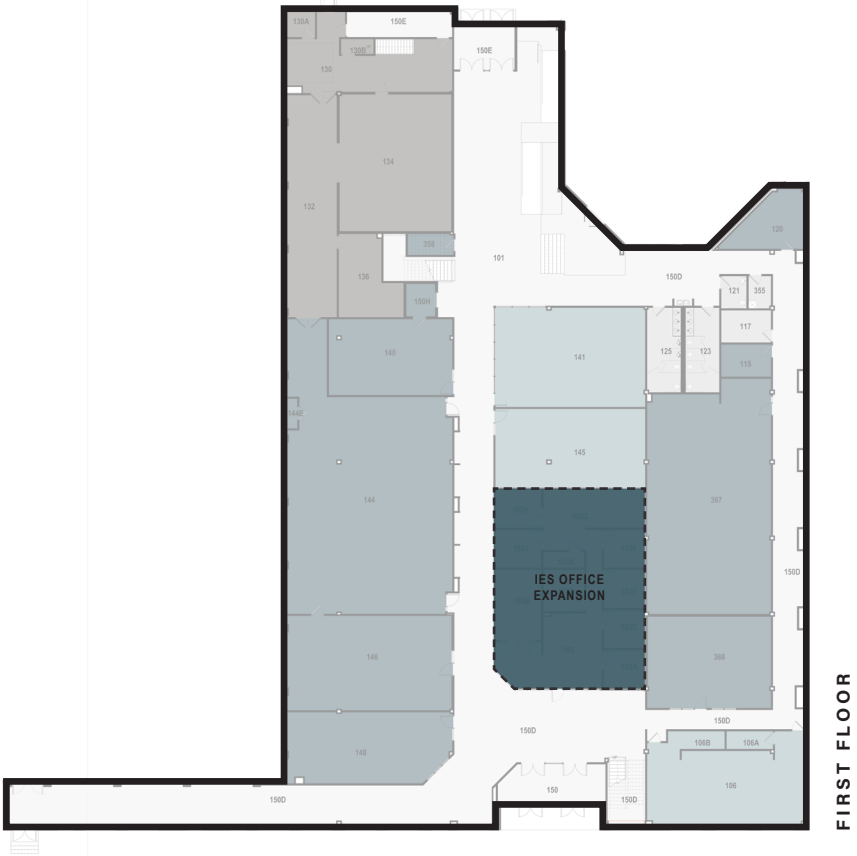
CHEMICAL ENGINEERING	CIVIL ENGINEERING	BIOMEDICAL ENGINEERING
ELECTRICAL ENGINEERING + COMPUTER SCIENCE	COLLEGE OF ENGINEERING + MINES	INSTITUTE OF ENERGY STUDIES
GEOLOGY + GEOLOGICAL ENGINEERING	PETROLEUM ENGINEERING	BUILDING SUPPORT
MECHANICAL ENGINEERING	REGISTRAR	CIRCULATION

UPSON I RENOVATION SF

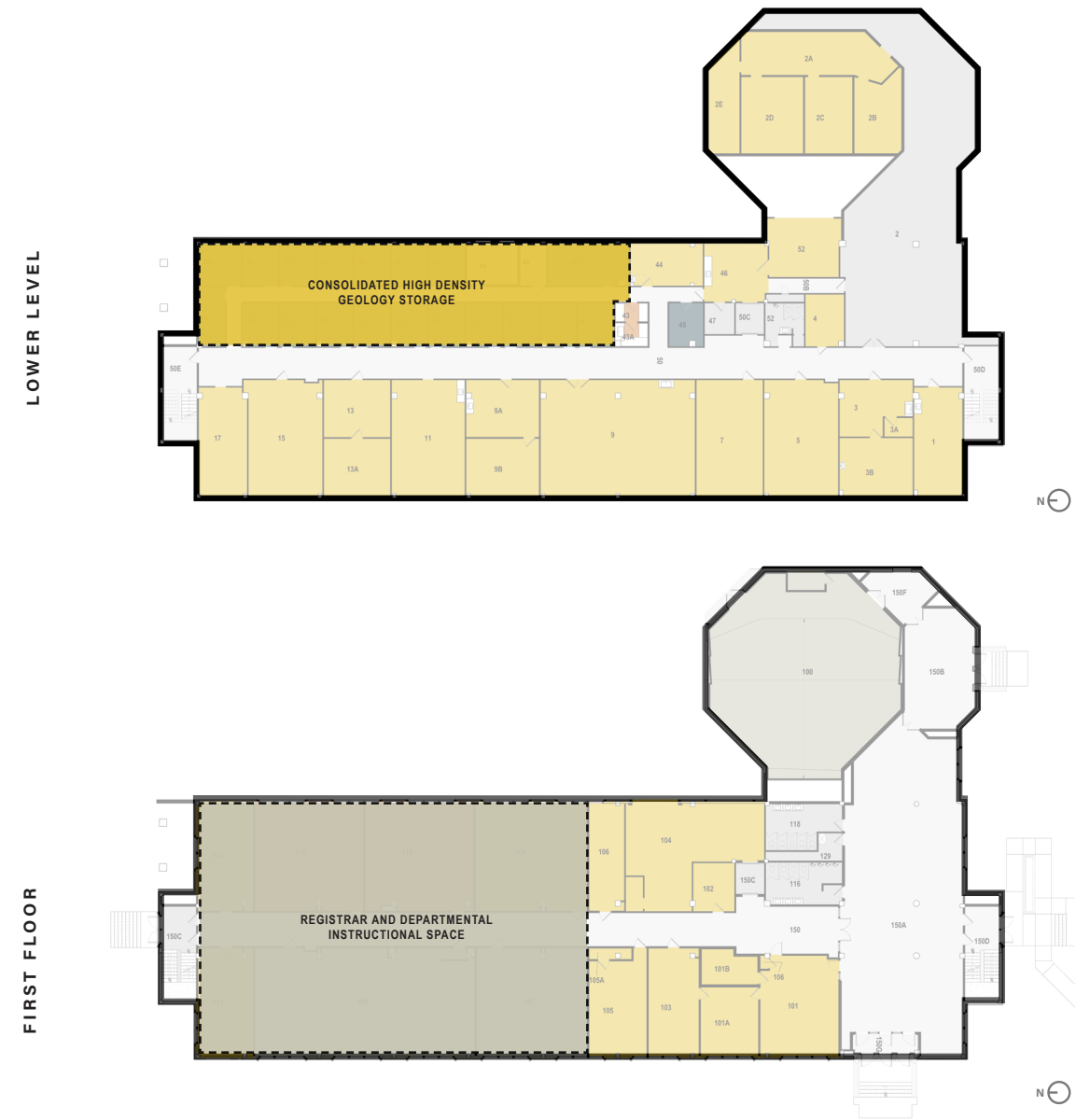
	ROOM #	EXISTING NSF	PROPOSED QTY	NSF EACH	PROPOSED NSF	NSF DIFF.	PROPOSED GSF
Petroleum Engineering		3,944			9,420	5,476	16,821
PE Teaching Laboratory	146	1,000	1	1,980	1,980	980	3,600
Industry Partner Computational Laboratory	New	0	1	1,320	1,320	1,320	2,400
New PE Research Laboratory	New	0	1	1,980	1,320	1,320	2,400
Grad Students / PhD Offices	Multiple	2,944	60	80	4,800	1,856	8,421
Institute for Energy Studies		0			726	726	1,274
IES Equip. Test Lab Expansion	New	0	1	726	726	726	1,274
Mechanical Engineering		16,005			22,782	6,777	41,422
ME Instructional Machine Shop new	New	0	1	1,452	1,452	1,452	2,640
ME Instructional Machine Shop exg	102	1,568	1	1,568	1,568	0	2,851
ME Faculty Research Laboratory	100	2,015	1	2,015	2,015	0	3,664
ME Freshman Projects	101	470	1	726	726	256	1,320
ME Student Projects Laboratory	New	0	1	1,815	1,815	1,815	3,300
Laser Laboratory	105B	426	1	660	660	234	1,200
ME Undergraduate Robotics Lab	106A	366	1	366	366	0	665
ME Faculty Research Laboratory	106C	260	1	260	260	0	473
ME Formula Car Cage	114A	1,110	1	1,110	1,110	0	2,018
ME Student Projects Research Laboratory	114	1,741	1	1,741	1,741	0	3,165
ME Machine Shop new	New	0	1	1,452	1,452	1,452	2,640
ME Machine Shop exg	104	1,911	1	1,911	1,911	0	3,475
Storage	2	370	1	370	370	0	673
Storage	3	370	1	370	370	0	673
ME High Bay Support	102A	246	1	246	246	0	447
Welding Shop	105	1,232	1	1,980	1,980	748	3,600
Welding Supply	105A	126	1	126	126	0	229
ME Foundry	106D	332	1	332	332	0	604
Storage	106E	139	1	139	139	0	253
Storage	106G	181	1	181	181	0	329
ME Foundry Support	106K	71	1	71	71	0	129
Storage	106M	187	1	187	187	0	340
Secure Storage	106B	150	1	150	150	0	273
ME Wood Shop	111	479	1	479	479	0	871
ME Vibration Equipment Cage	114B	395	1	395	395	0	718
Lab Manager's Office	106L	110	1	120	120	10	218
Grad Students / PhD Offices	Multiple	1,750	32	80	2,560	810	4,655
TOTALS		19,949			32,928	12,979	59,517

COLLABORATIVE ENERGY CENTER RENOVATION SCOPE

There is no significant work planned for the Collaborative Energy Center (CEC). There is a suite of College of Engineering administrative offices in the center of the first floor of CEC that will be relocated to the Hyslop site. This vacated office space can be used for requested office expansion for the Institute for Energy Studies at no cost.

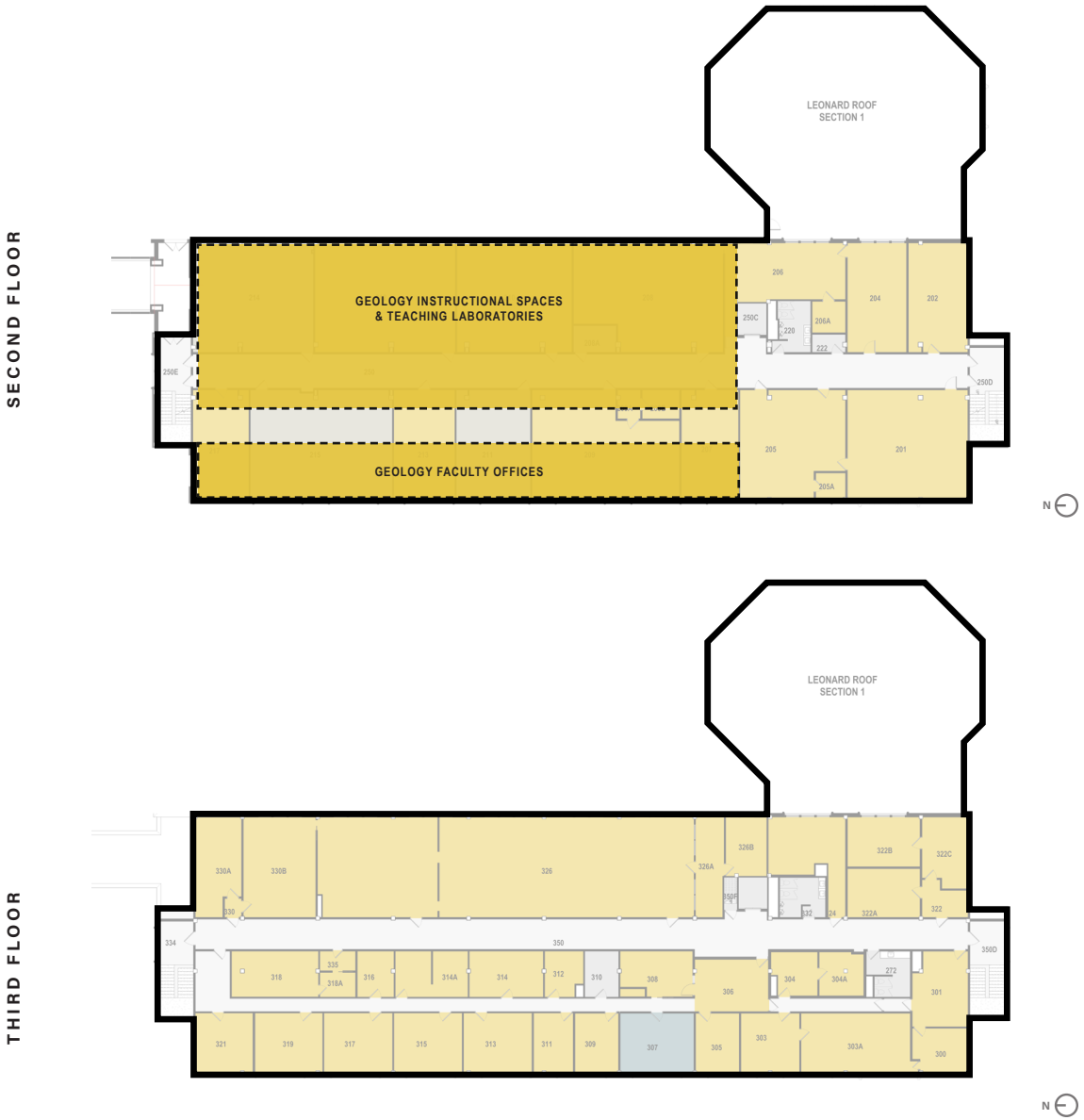


DEPARTMENT BREAKOUT LEGEND					
CHEMICAL ENGINEERING	CIVIL ENGINEERING	BIOMEDICAL ENGINEERING			
ELECTRICAL ENGINEERING + COMPUTER SCIENCE	COLLEGE OF ENGINEERING + MINES	INSTITUTE OF ENERGY STUDIES			
GEOLOGY + GEOLOGICAL ENGINEERING	PETROLEUM ENGINEERING	BUILDING SUPPORT			
MECHANICAL ENGINEERING	REGISTRAR	CIRCULATION			



LEONARD HALL RENOVATION SCOPE

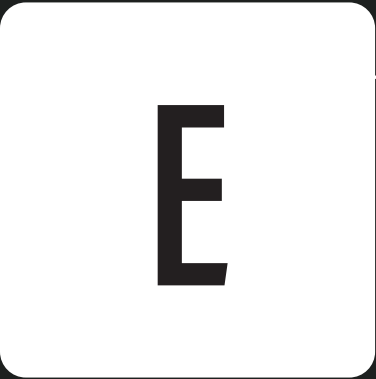
Upon completion of the work at the Hyslop site and the renovations in Upson I, several spaces in Leonard Hall will be vacated to allow for a moderate phased renovation to take place in that portion of the complex. By this time, the Petroleum Engineering Post Doc offices in the west side of the basement will have been relocated to the Upson I mezzanine and two sizable computing laboratories will have been relocated to the Hyslop site. This will clear the way for a phased renovation in Leonard Hall to consolidate and reduce the size of the Geology and Geological Engineering Faculty Offices as well as a consolidation of the large amount of Geology specimen storage areas into a



high-density storage suite. These vacations and reductions in overall net square feet will free up approximately 8,800 nsf which can then be planned to house the majority of the Registrar controlled classrooms that are currently located in various portions of the complex (which currently occupies approximately 6,500 nsf).

DEPARTMENT BREAKOUT LEGEND

- | | | |
|---|--|--|
| ■ CHEMICAL ENGINEERING | ■ CIVIL ENGINEERING | ■ BIOMEDICAL ENGINEERING |
| ■ ELECTRICAL ENGINEERING + COMPUTER SCIENCE | ■ COLLEGE OF ENGINEERING + MINES | ■ INSTITUTE OF ENERGY STUDIES |
| ■ GEOLOGY + GEOLOGICAL ENGINEERING | ■ PETROLEUM ENGINEERING | ■ BUILDING SUPPORT |
| ■ MECHANICAL ENGINEERING | ■ REGISTRAR | ■ CIRCULATION |



COSTS

INTRODUCTION

The following pages provide a probable opinion of building construction and renovation costs.

COSTS

TABULATION

The tabulation of costs has been organized to provide separate pricing across three primary phases of construction and renovation including: (1) New Construction on the Hyslop / Starcher site, (2) Moderate renovations to Upson I Hall, and (3) Minor renovations to Leonard Hall. All work in Upson I and Leonard will likely be performed only after the new construction on the Starcher Hyslop site has been completed and significant areas of the Upson I have been vacated. All pricing shown is in mid-2022 dollars. Funds for demolition, abatement, site work, site utilities, parking, escalation and all typical soft costs have not been included and will be calculated as the project moves forward.

Net Square Feet	142,695
Gross Square Feet	259,011
Totals Construction Cost	\$118,558,503

BREAKDOWN PER DEPARTMENT

The preliminary costs shown below are for construction and demolition, only in 2022 dollars. No additional funds for escalation, soft costs, fees, design, furnishings or additional site costs have been included.

DEPARTMENT	PHASE 1			PHASE 2		
	New Construction Hyslop/Starcher Site			Renovations in Existing Complex		
	NSF	GSF	COST	NSF	GSF	COST
Petroleum Engineering	0	0	\$0	9,420	16,821	\$5,976,842
Geology & Geological Engineering	0	0	\$0	2,540	4,421	\$1,437,031
Civil Engineering	22,140	40,255	\$21,497,182	0	0	\$0
Chemical Engineering	22,501	40,911	\$22,374,273	0	0	\$0
Electrical Engineering & Computer Science	20,354	37,007	\$18,912,591	0	0	\$0
Institute for Energy Studies	0	0	\$0	726	1,274	\$509,474
Mechanical Engineering	10,220	18,582	\$9,274,955	28,546	51,534	\$14,758,355
College of Engineering	13,630	24,736	\$12,435,050	0	0	\$0
Registrar	0	0	\$0	2,916	5,830	\$1,894,750
Biomedical Engineering	9,702	17,640	\$9,488,000	0	0	\$0
Totals	98,547	179,131	\$93,982,051	44,148	79,880	\$24,576,452

