

Degree Program Assessment Plan and SLO Achievement

Master of Science in Construction Management

College: College of Architecture and Construction Management

Program: Master of Science in Construction Management

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Mission Statement

The mission of the Department of Construction Management at Kennesaw State University is to develop students for professional construction leadership positions, with a commitment to ethical and environmental responsibility, as well as prepare interested students for advanced degree programs.

To accomplish the Department of Construction Management's mission, we use the following plan:

Our programs are modeled to reflect the organization of the construction industry by offering industry emphasis areas (IEAs) in General Construction – Commercial, Residential Construction, Heavy Civil Construction and Land Development, Specialty Trade Construction/Facilities Management. This structure allows students to study a combination of IEA electives, or to focus on one IEA.

We endeavor to exceed the ACCE Accreditation standards for BS CM and MS CM degree programs to not only stay competitive, but to remain a leader among institutions offering one or more similar degrees.

Through industry outreach and professional development activities of the Construction Management Department faculty at KSU, we ensure that the quality of instruction and related technologies stay relevant. These faculty members also keep up with trends and innovations that continuously reshape the construction industry. All Construction Management tenure-track faculty members publish in peer-reviewed publications and participate in regional, national, and international conferences related to construction.

For quality assurance and enhancement, the department, in collaboration with the KSU CM Industry Advisory Board (CM IAB), undertakes surveys of stakeholders, which include students, alumni, employers, and CM IAB members. The results of these surveys are shared periodically with the board and faculty to identify opportunities for improvement at the course, program, and department levels.

The Department of Construction Management encourages faculty to be well-informed and conversant with current industry issues. We deliver CM programs at KSU that:

- Serve the changing needs of the construction industry and an increasingly diverse national and international student population,
- Serve as a positive force in the local and national construction industry through collaboration with other institutions and participation in professional and community organizations,
- Advance the body of construction management knowledge through scholarly research, presentations, and publications,
- Support the strategic and academic direction of Kennesaw State University and the College of Architecture and Construction Management

Program Objectives (PO) with Assessment Method

PO1: Prepare ethical construction project management leaders.

- Program Student Learning Outcomes Assessments
- Students Exit Surveys
- Alumni Surveys
- Employer Surveys

PO2: Conduct research and disseminate findings through publications.

- Program Student Learning Outcomes Assessments
- Students Exit Surveys
- Alumni Surveys
- Employer Surveys

PO3: Promote interest in pursuing advanced degrees.

- Program Student Learning Outcomes Assessments
- Students Exit Surveys
- Alumni Surveys
- Employer Surveys

PO4: Maintain MS program ACCE accreditation.

- ACCE MS self-study
- ACCE Annual Progress Reports

PO5: Increase visibility and awareness of the CM Department.

- Peer-reviewed faculty publications in journals and conferences
- Awards, leadership activities at the national, state, and regional level
- Industry Advisory Board activities
- Number of organizations coming to the department to recruit CM graduates and interns.

Table 1: Correlation of Program Objectives (PO)s and Student Learning Outcomes (SLO)s

SLO	PO1	PO2	PO3	PO4
SLO1: Create effective and professional written communications	X	X	X	X
SLO2: Apply critical thinking	X	X	X	X
SLO3: Apply problem solving techniques	X	X	X	X
SLO4: Apply decision making techniques	X	X	X	X
SLO5: Apply research methods	X	X	X	X
SLO6: Apply advanced communication technology	X			X
SLO7: Apply professional ethics	X	X		X
SLO8: Apply advanced construction management practices	X	X	X	X
SLO9: Understand risk management	X		X	X
SLO 10: Understand the principles of leadership in business	X		X	X

Table 2 : Details of the Program Quality Improvement Plan used for the MS CM program.

Assessment	Assessment Method	Frequency of Assessment	Data Collected Media	How Collected	From Whom Collected	Responsible for Collection	Who Evaluates Data	Frequency of Evaluation
Direct Measure	Program Level Outcome Assessment (Students Learning Outcome)	Once per year	Students work	Paper or Online	Students	Faculty	Faculty	Once every three years
Feedback	Course Evaluation	Once per year	Students course evaluation	Online	Students	Faculty	Faculty	Once per year
Indirect Measure	Graduate (MS Program) Exit Surveys	Once per year	Surveys	Online	Graduating Students	Graduate Coordinator	Graduate Coordinator/D ept. Chair	Once per year
Feedback	Employer Surveys	Once every five years	Surveys	Online	Employers of CM graduates	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every six years
Feedback	Alumni Surveys	Once every five years	Surveys	Online	CM Alumni	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every six years
Feedback	Faculty Feedback	Once every five years	Surveys and /or Program meeting	Online	Faculty	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every three years
Feedback	Industry Advisory Board Feedback	Once every five years	Surveys	Online	Industry advisory members	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every three years

Student Learning Outcomes – (Data from Spg23-Fall23)

Upon successful completion of the MS in Construction Management graduates will be able to...

SLO 1 - Create effective and professional written communications.

These Student Learning Outcomes (SLOs) utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6000 - Information Methods uses one CLO and is covered in a paper. Ability to communicate using professional oral and written communication skills. CM 6200 - Strategic Bidding & Estimating uses one CLOs and is covered in a paper. Students shall write a mid-term paper on construction or construction management using professional and technical language. CM 6560 - Design-Build MEP Systems uses three CLOs and is covered in the final project. The student will be able to write a research paper/report. The student will be able to disseminate research information through journal/conference papers based on an individual research project completed during the course. The student will be able to analyze different uses of digital technology and strategies to communicate for construction projects. CM 6600 - Construction Risk Analysis and Control uses two CLOs and is covered in a PPT and Narrative. Recognize how to transfer and avoid risk as an owner/GC. Describe and understand the risk associated with the construction contract. CM 7704 - Masters Project uses one CLO and is covered in a quiz. Ability to communicate- professional oral and written communication skills.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6000 - Information Methods
 - CM 6200 - Strategic Bidding & Estimating
 - CM 6560 - Design-Build MEP Systems
 - CM 6600 - Construction Risk Analysis and Control
 - CM 7704 - Masters Project
- Achieved average score for the SLO: 92.49% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.33

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 =

Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator

Achieved average score for MS CM Alumni Survey: 3.80
Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 3.80

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.12

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.92

SLO 2 – Apply critical thinking.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6000 - Information Methods uses one CLO and is covered in a paper. Ability to carry out research process on a subject related to the construction industry reflecting critical thinking and creativity. CM 6200 - Strategic Bidding & Estimating uses one

CLO and is covered in a quiz. Student shall apply the principle of developing a Business Plan leading to a criteria for Bid Selection. CM 6610 - Sustainable Construction uses one CLO and is covered in a SDG paper, an Electrical Discussion and a Decarbonization Discussion. Understand the basic principles of sustainable construction. CM 6620 - Sustainable Operation & Maintenance uses two CLOs and is covered in a final project. Examine sustainability options for existing buildings. Apply rating systems and/or sustainability strategies for existing buildings. Lastly the CM 7704 - Masters Project uses one CLO and is covered in a paper. Ability to carry out research process on a subject related to the construction industry, reflecting critical thinking and creativity.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6000 - Information Methods
 - CM 6200 - Strategic Bidding & Estimating
 - CM 6610 - Sustainable Construction
 - CM 6620 - Sustainable Operation & Maintenance
 - CM 7704 - Masters Project
- Achieved average score for the SLO: 95.46% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.11

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 4.08

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 =

Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.38

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.15

SLO 3 – Apply problem solving techniques.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6000 - Information Methods uses one CLO and is covered in a paper and a presentation. Ability to disseminate research information, preferably through journal/ conference papers based on an individual research project completed during the course- problem solving and decision-making. CM 6320 - Construction Information Systems uses one CLO and is covered in a project. Create a database for project using MS Access. CM 6600 - Construction Risk Analysis and Control uses four CLOs and is covered in a PPT and Narrative, Risk excel and Quiz 5. Select risk factors associated with construction projects. Recognize and reduce risk by utilizing a decision-making method. Identify differences in quality control vs. quality assurance. Describe quality control/assurance tools and techniques. CM 6710 - Finance for Facility Managers uses two CLOs and is covered in an exam. Prepare facility capital and operational estimates. Use economic decision-making tools to analyze alternative facility or asset decisions and cost control. CM 6720 - Facilities Management Strategies uses three CLOs and is covered in homework. Improving product or a process in FM department or organization (quality assurance). Solve a decision problem using multi-attribute decision-making. Analyze a case to discuss the role of human factors in organizational success.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6000 - Information Methods
 - CM 6320 - Construction Information Systems
 - CM 6600 - Construction Risk Analysis and Control
 - CM 6710 - Finance for Facility Managers
 - CM 6720 - Facilities Management Strategies

- Achieved average score for the SLO: 93.66% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.11

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 4.24

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.50

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.46

SLO 4 – Apply Decision making techniques.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6000 - Information Methods uses one CLO and is covered in a paper and a presentation. Ability to disseminate research information, preferably through journal/ conference papers based on an individual research project completed during the course- problem solving and decision-making. CM 6200 - Strategic Bidding & Estimating uses one CLO and is covered in a quiz. Student shall demonstrate proficiency in using interpreting drawings, using Bluebeam software for Quantity Surveying and R. S. Means for Construction Estimating. CM 6710 - Finance for Facility Managers uses two CLOs and is covered in an exam and a presentation. Prepare facility capital and operational estimates. Use economic decision-making tools to analyze alternative facility or asset decisions and cost control. CM 6720 - Facilities Management Strategies uses three CLOs and is covered in homework. Improving product or a process in FM department or organization (quality assurance). Solve a decision problem using multi-attribute decision-making. Analyze a case to discuss the role of human factors in organizational success.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6000 - Information Methods
 - CM 6200 - Strategic Bidding & Estimating
 - CM 6710 - Finance for Facility Managers
 - CM 6720 - Facilities Management Strategies
- Achieved average score for the SLO: 93.22% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.00

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.

- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
 - Achieved average score for MS CM Alumni Survey: 3.96

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.27

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.92

SLO 5 – Apply research methods.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6000 - Information Methods uses one CLO and is covered in a paper, a presentation, an abstract and a library assignment. Apply research methods. CM 6100 - Construction Law: Contracts, and Claims uses one CLO and is covered in an exam and a contract exercise. Recognize contract, common and regulatory law in construction contracts and projects. CM 7704 - Masters Project uses one CLO and is covered in a paper and an abstract. Apply research methods.

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- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6000 - Information Methods
 - CM 6100 - Construction Law: Contracts, and Claims
 - CM 7704 - Masters Project
- Achieved average score for the SLO: 90.83% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's

graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.44

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 4.04

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.58

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.92

SLO 6 – Use of information and communication technology.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6310 - Advanced Scheduling and Integrated Control uses one SLO and is covered in a final paper. Investigate, search, analyze, and recommend solutions for tasks that are related to specific scheduling, or estimating challenge. CM 6560 - Design-Build MEP Systems uses one SLO and is covered in a final paper. The student will be able to analyze different uses of digital technology and strategies to communicate for construction projects. CM 6600 - Construction Risk Analysis and Control uses one SLO and is covered in a Con Tech Quiz. Understand the advantages of advanced technology in risk and quality management. CM 6620 - Sustainable Operation & Maintenance uses one SLO and is covered in a final paper. Develop an implementation plan for a sustainability project.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6310 - Advanced Scheduling and Integrated Control
 - CM 6560 - Design-Build MEP Systems
 - CM 6600 - Construction Risk Analysis and Control
 - CM 6620 - Sustainable Operation & Maintenance
- Achieved average score for the SLO: 90.43% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.11

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 3.92

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.19

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.92

SLO 7 – Apply professional ethics.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6100 - Construction Law: Contracts, and Claims uses one SLO and is covered in a lab. Student shall demonstrate proficiency in using interpreting drawings, using Bluebeam software for Quantity Surveying and R. S. Means for Construction Estimating. CM 6610 - Sustainable Construction uses one SLO and is covered in a SDG paper. Student shall apply the principle of developing a Business Plan leading to a criteria for Bid Selection.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6100 - Construction Law: Contracts, and Claims
 - CM 6610 - Sustainable Construction
- Achieved average score for the SLO: 94.52% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.33

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni

1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 4.20

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.58

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.38

SLO 8 – Apply advanced construction management practices.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6200 - Strategic Bidding & Estimating uses two SLOs and are covered in a lab and Quiz 5. Student shall demonstrate proficiency in using interpreting drawings, using Bluebeam software for Quantity Surveying and R. S. Means for Construction Estimating. Student shall apply the principle of developing a Business Plan leading to a criteria for Bid Selection. CM 6310 - Advanced Scheduling and Integrated Control uses two SLOs and are covered in an assignment. Use advanced scheduling software to prepare schedules. Loading and monitoring cost to schedules and use different theories of tracking the percent completion for projects. CM 6610 - Sustainable Construction uses one SLO and is covered in Decarbonization assignment and Thermal Resistance assignment. Analyze methods, materials, and equipment used to construct projects.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed

- every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6200 - Strategic Bidding & Estimating
 - CM 6310 - Advanced Scheduling and Integrated Control
 - CM 6610 - Sustainable Construction
- Achieved average score for the SLO: 96.33% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.11

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 3.88

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 4.35

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0

- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.92

SLO 9 – Understand risk management.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6100 - Construction Law: Contracts, and Claims uses two SLOs and are covered in an ethics exercise, an exam and a contract exercise. Examine legal documents and contracts to ensure ethical behavior and principles are understood and followed throughout the agreement. Author a construction contract with all legal terms, risk, contingencies, addendums, etc. as required by AIA for construction related projects. CM 6200 - Strategic Bidding & Estimating uses one SLO and is covered by a quiz. Student shall apply the principle of developing a Business Plan leading to a criteria for Bid Selection. CM 6600 - Construction Risk Analysis and Control uses two SLOs and are covered in the PPT and Narrative as well as the risk excel. Recognize how to transfer and avoid risk as an owner/GC. Describe and understand the risk associated with the construction contract.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6100 - Construction Law: Contracts, and Claims
 - CM 6200 - Strategic Bidding & Estimating
 - CM 6600 - Construction Risk Analysis and Control
- Achieved average score for the SLO: 94.93% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 4.44

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0

- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 3.60

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.92

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.69

SLO 10 – Understand the principles of leadership in business.

These SLOs utilize direct assessments as well as indirect assessments:

Direct Assessment – CM 6100 - Construction Law: Contracts, and Claims uses three SLOs and are covered in an exam, a contract exercise and a quiz. Identify within construction contracts loopholes, liabilities, illegal content etc. Evaluating and applying the various communication and persuasion techniques designed to improve negotiating effectiveness. Identify legal terms, contract terms, and construction term used in documents for construction projects. CM 6200 - Strategic Bidding & Estimating uses one SLO and is covered in a quiz. Student shall apply the principle of developing a Business Plan leading to a criteria for Bid Selection. CM 6310 - Advanced Scheduling and Integrated Control uses one SLO and is covered in an assignment. Integrate data visualization, CAD, and scheduling software for resource management and advanced scheduling. CM 6620 - Sustainable Operation & Maintenance uses one SLO and is covered in a final project. Analyze sustainability projects using financial tools.

- Target: 90% of the individual scores are greater than 80
- Implementation Plan (timeline): Data gathered annually (each year); analyzed every 3 years
- Key/Responsible Personnel: Instructor of record for
 - CM 6100 - Construction Law: Contracts, and Claims

- CM 6200 - Strategic Bidding & Estimating
- CM 6310 - Advanced Scheduling and Integrated Control
- CM 6620 - Sustainable Operation & Maintenance
- Achieved average score for the SLO: 92.21% of the individual scores are greater than 80, for detailed see SLO-CLO Achievement plan or map.

Indirect Assessment – MS Exit Survey. The MS Exit Survey is given at the end of the student's graduation. The data is collected annually after the academic year has concluded. The survey asked the respondent to determine their level of knowledge as it pertains to the Program Learning Outcomes from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: 3.0
- Ideal Target: 4.0
- Implementation Plan (timeline): Survey is administered to graduating students at the end of each semester and data is analyzed every year.
- Key/Responsible Personnel: Graduate Program Coordinator
- Achieved average score for MS Exit Survey: 3.67

Indirect Assessment – MS CM Alumni Survey. The Alumni Survey is given to recent CM alumni 1-5 years from graduation date. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for MS CM Alumni Survey: 3.64

Indirect Assessment – Industry Survey. The Industry Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5 years.
- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.92

Indirect Assessment – Employer Survey. The Employer Survey is given to employers supervising MS CM graduates. It contains all 10 Program SLOs and asks those in industry to rate the learning of students on each outcome listed. Responses are scaled from a very low to very high scale. 1 = Very low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High.

- Acceptable Target: Response average of >3.0
- Ideal Target: Response average of > 4.0
- Implementation Plan (timeline): Survey to occur every 3 years and data is analyzed every 5

years.

- Key/Responsible Personnel: Department Chair/Graduate Program Coordinator
- Achieved average score for Industry Survey: 3.54

Evaluation Methodology

Students Learning Outcomes (SLOs) are mapped with the Course-Level Outcomes (CLO), and connected to course-level assessment. The course-level assessment tools used in the MS CM Program are exams, homework/assignments, projects, or combination of them in each course. At the beginning of the assessment cycle, the Graduate Program Coordinator, in consultation with Graduate faculty, CM IAB-Graduate Program Committee, and the Department Chair, sets each SLO target achievement value and communicates to the instructors. Using these target values, instructors set the target achievement value of mapped CLOs contributing towards these SLOs. The instructors also finalize the assessment tools required to assess the CLOs. The finalization of the assessment tools is largely determined by the instructor, and these can vary for each academic year.

During the semester, the instructor assesses the level of achievement of CLOs through different assessment tools and collects data from the course assessment tools. At the end of each semester, the instructor determines the level of achievement of CLOs.

The achieved levels are compared with target levels. In addition to this, the instructors use the student course evaluations. The complete course evaluations and results are made available to the respective faculty. In students addition, the Department Chair has access to them and utilizes them in annual faculty evaluations. After reviewing this data and the course evaluations, the instructor suggested an improvement plan for CLO. The instructor forwards the assessment data to the Graduate Program Coordinator.

The Graduate Program Coordinator assesses the achievement of the student learning outcomes. The Graduate Program Coordinator will determine the achievement of each student learning outcome (SLO) by calculating the mean of “Achieved class average score for the CLO” of assessment tools contributing towards the SLO. These assessment tools can be from one course or more than one course. This calculated mean is compared with the target set, and depending upon whether the target is achieved or not, appropriate recommendations are made to improve the achievement of the SLO. These recommendations are further reviewed by Graduate faculty, CMIAB- Graduate Program Committee and Department Chair. Once these are approved, the Graduate Program Coordinator, in consultation with Graduate faculty, CIAB-Graduate Program Committee and Department Chair, drafted the action plan to implement the recommendations. This action plan includes the responsible person and the steps to implement the actions. This action plan will be implemented in the following academic year. These recommendations are presented to Graduate faculty to incorporate the changes at the course level. Upon receiving the recommendations, the instructor will update the course content if required.

At the beginning of the assessment cycle, the Graduate Program Coordinator in consultation with Graduate faculty, CIAB- Graduate Program the Committee and Department Chair set each SLO target achievement value as 85% (2017-2018) and 90% (2023). Instructors use this target value to set the target achievement value of mapped course learning outcome. (CLO)s contributing towards these SLOs.

The instructors also finalized the assessment tools required to assess the CLOs achievement. During the semester, the instructor assessed the level of achievement of CLOs through different assessment tools and collected course assessment tools data. The instructor determined the level of achievement of CLOs. The achieved levels were compared with target levels. After reviewing this data and course evaluations the instructor suggested the improvement plan as listed under the “Improvement Plan for the CLO” column.

This assessment data was forwarded to the Graduate Program Coordinator. The Graduate Program Coordinator determined each student's learning outcome's achievement by calculating the mean of “Achieved class average score for the CLO” assessment tools of various courses contributing to the SLO.

This flowchart shows a structured framework for the Quality Improvement Plan (QIP) of the MS Construction Management Program focusing on Student Learning Outcomes (SLO), Course Learning Outcomes (CLO), Course Evaluations, MS CM Exit Surveys, Employer Surveys, Alumni Surveys, CM Industry Advisory Board, and faculty feedback.

Part A: Faculty level improvement one year cycle

Faculty level improvement one year cycle shows a structured framework for the Quality Improvement Plan (QIP) of MS Construction Management Program based on Student Learning Outcomes (SLO), Course Learning Outcomes (CLO), Course Evaluations, and MS CM Exit Survey.

The process has been divided into three main parts including:

A1: INPUTS:

- SLO/CLO Assessment Results:

In this step, the faculty execute the SLO/CLO assessment in an excel file and report to the Graduate Program Coordinator who then submits the report to the Department Chair.

- Student Course Evaluation:

In this step, at the end of the semester, KSU gives a link to the students for the purpose of evaluating each course in the form of a survey. The results are shared with the course faculty and the Department Chair through Watermark.

- Exit Surveys:

In this step, the Graduate Program Coordinator executes a survey with the students who are in their last semester. The Graduate Program Coordinator shares the results of the survey and any analysis/recommendations with the Department Chair.

A2: PROCESS:

- Faculty feedback and development of improvement plan for SLO/CLO:

In this step, faculty accesses the reports from the INPUT phase, and they analyze and prepare improvement plans, which are shared with the Graduate Program Coordinator and the Department Chair in form of Excel file and/or as part of the faculty members' ARDs.

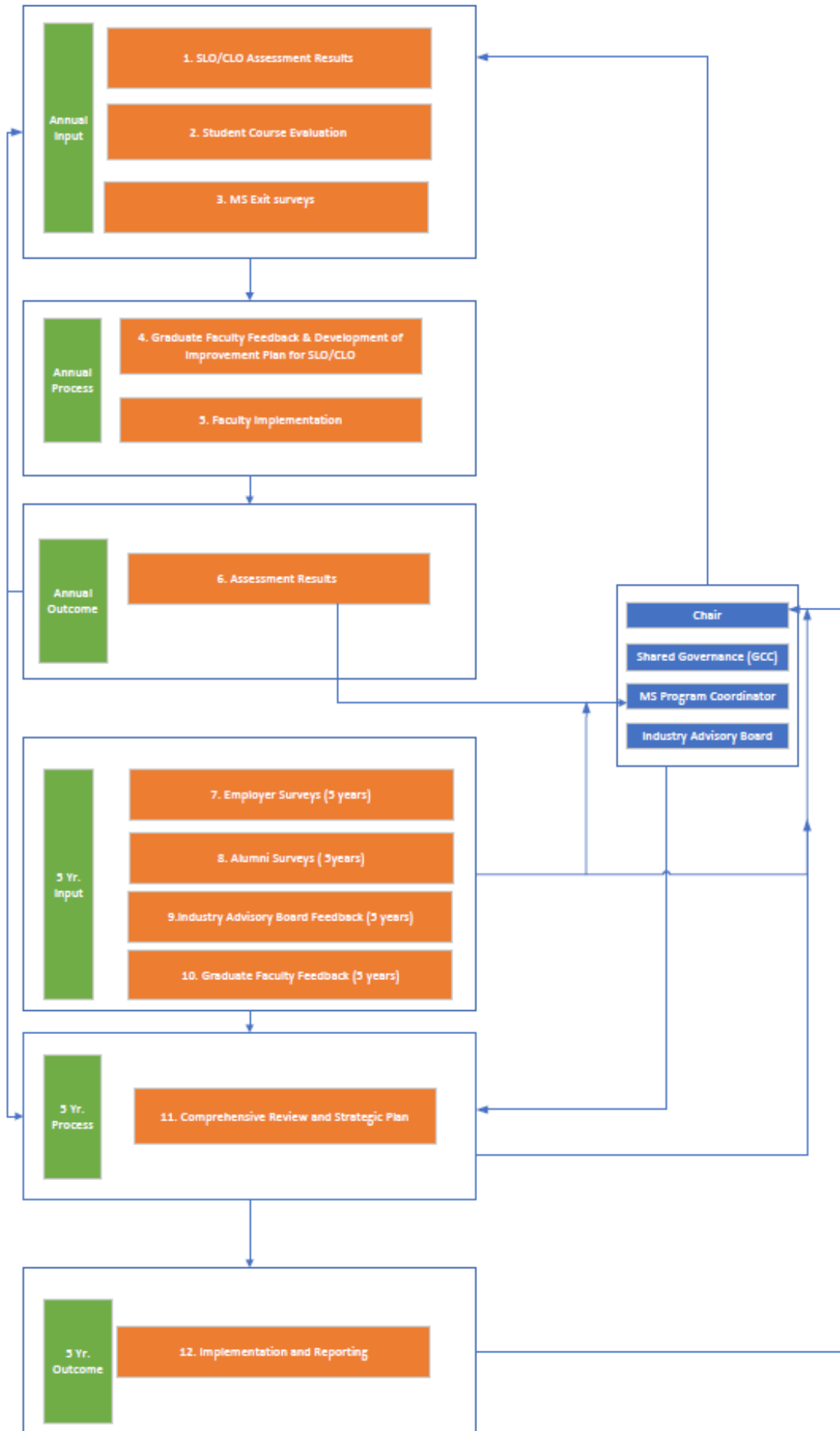
- Faculty Implementation:

In this step, faculty implements the improvement plans in consultation with the Graduate Program Coordinator and the Department Chair.

A3: OUTCOME:

- ASSESSMENT RESULTS:

This step returns the faculty to the INPUT phase of the QIP and assessments are performed again to begin a new one-year cycle.



Part B: Program level improvement five-year cycle

The Program level improvement five-year cycle shows a structured framework for the Quality Improvement Plan (QIP) of the MS Construction Management program based on Employer surveys, Alumni Surveys, Industry Advisory Board, and faculty feedback.

The process has been divided in Three main part they are:

B1: INPUTS:

- Employer survey:
Every five years the Graduate Program Coordinator executes a survey of employers. A survey report with analysis is then submitted to the Department Chair and shared with Faculty.
- Alumni Survey:
Every five years the Graduate Program Coordinator executes a survey of the alumni. A survey report with analysis is then submitted to the Department Chair and shared with Faculty.
- Industry Advisory Board:
Every five years the Graduate Program Coordinator executes a survey of the CM IAB. A survey report with analysis is then submitted to the Department Chair and shared with Faculty.
- Faculty Feedback:
Every five years the Graduate Program Coordinator executes a survey of the CM Faculty. A survey report with analysis is then submitted to the Department Chair and shared with Faculty.

B2: PROCESS:

- Comprehensive Review & Strategic Plan:
Every five years the Department Chair, the Graduate Program Coordinator, and the Graduate Faculty including the Graduate Curriculum Committee, and CM IAB, prepares a Comprehensive Review & Strategic Plan. A report, with analysis and recommendations is submitted to the Department Chair in the form of notes (e.g., adhoc discussions, meeting, retreats, ect.).

B3: OUTCOME:

- Implementation and Reporting:
Every five years the Graduate Program Coordinator prepares a report, which is shared with the Department Chair and faculty, and then it is submitted to ACCE.

Part C: Overall improvement cycle

Overall QIP cycle is connecting the one-year faculty improvement cycle, and five-year program improvement cycle with involvement of the Department Chair, the Graduate Program Coordinator, Graduate Curriculum Committee, and Industry Advisory Board:

The one-year faculty improvement cycle, and five-year program improvement cycle are connected through the Department Chair, the Graduate Program Coordinator, Graduate Curriculum Committee, and Industry Advisory Board with following explanation:

- The Department Chair Gets the following reports:

1. SLO/CLO Assessment Results
 2. Alumni Survey
 3. Comprehensive Review & Strategic Plan
 4. Implementation and Reporting
- Graduate Faculty/GCC receives and analyzes the following reports:
 1. Comprehensive Review & Strategic Plan
 - The Graduate Program Coordinator receives the following reports, analyzes, and distributes them:
 2. SLO/CLO Assessment Results
 3. Student course evaluations
 4. Exit surveys
 5. Employer surveys
 6. Alumni surveys
 7. Industry Advisory Board
 8. Faculty feedback
 - Industry Advisory Board (IAB) receives the following reports:
 1. Comprehensive Review & Strategic Plan

All the Blocks in flowchart meet at least once in the flow chart by initiating, or receiving the reports, or by participating in a survey.

Comparisons between SLOs from the academic years 2017-2018 and 2023

Immediately previous summary report of the results, resulting corrective actions, follow-up of the impact of actions taken on student performance including the dates of each follow-up, and description of any revisions made to Degree Program assessment tools are provided below:

Section 1: List of SLOs: One list from 2017-2018 and another list with the current SLOs.

Table 3: 2017-2018 SLOs and 2023 SLOs

SLOs list from 2017-2018	SLOs list from 2023
SLO 1. Critical Thinking and Creativity.	SLO 1. Create effective and professional written communications
SLO 2. Problem solving and decision making.	SLO 2. Apply critical thinking
SLO 3. Effective and professional oral and written communication	SLO 3. Apply problem solving techniques
SLO 4. Use of information and communication technology	SLO 4. Apply decision making techniques
SLO 5. Principles of leadership in business and management	SLO 5. Apply research methods
SLO 6. Current issues in construction.	SLO 6. Use of information and communication technology
SLO 7. Complex project decision making and associated risk management	SLO 7. Apply professional ethics

SLO 8. Professional ethics including application to situations and choices	SLO 8. Apply advanced construction management practices
SLO 9. Advanced construction management practices	SLO 9. Understand risk management
SLO 10. Research methods	SLO 10. Understand the principles of leadership in business

Section 2: The Quality Enhancement/Improvement Plan (describe how SLOs are assessed and how the program engages in continuous improvement).

Students Learning Outcomes (SLOs) are mapped with the course-level outcome (CLO), connected to course-level assessment. The course-level assessment tools used in the MS CM Program are exams, homework/assignments, projects, or combination of them in each course. At the beginning of the assessment cycle, the Graduate Program Coordinator, in consultation with Graduate faculty, CM IAB-Graduate Program Committee and the Department Chair, sets each SLO target achievement value and communicates to the instructors. Using these target values, instructors set the target achievement value of mapped course learning outcomes (CLO)s contributing towards these SLOs. The instructors also finalize the assessment tools required to assess the CLOs achievement. The finalization of the assessment tools is at the discretion of the instructor, and these can vary or may not vary for each academic year.

During the semester, the instructor assesses the level of achievement of CLOs through different assessment tools and collects data from the course assessment tools. At the end of each semester, the instructor determines the level of achievement of CLOs.

The achieved levels are compared with target levels. In addition to this, the instructors use the student course evaluations. The complete course evaluations and results are made available to the respective faculty. In students addition, the Department Chair has access to them and utilizes them in annual faculty evaluations. After reviewing this data and the course evaluations, the instructor suggested an improvement plan for CLO. The instructor forwards the assessment data to the Graduate Program Coordinator.

The Graduate Program Coordinator assesses the achievement of the student learning outcomes. The Graduate Program Coordinator will determine the achievement of each student learning outcome (SLO) by calculating the mean of “Achieved class average score for the CLO” of assessment tools contributing towards the SLO. These assessment tools can be from one course or more than one course. This calculated mean is compared with the target set, and depending upon whether the target is achieved or not, appropriate recommendations are made to improve the achievement of the SLO. These recommendations are further reviewed by Graduate faculty, CMIAB- Graduate Program Committee and Department Chair. Once these are approved, the Graduate Program Coordinator, in consultation with Graduate faculty, CIAB-Graduate Program Committee and Department Chair, drafted the action plan to implement the recommendations. This action plan includes the responsible person and the steps to implement the actions. This action plan will be implemented in the following academic year. These recommendations are presented to Graduate faculty to incorporate the changes at the course level. Upon receiving the recommendations, the instructor will update the course content if required.

Section 3: The summary data tables for SLOs: One from 2017-2018 and one from 2023.

Each program learning outcome is assessed annually through course level learning outcomes and graduate

students exit survey. It is also assessed once in three years through Employer surveys and Alumni surveys. Quality plan is implemented through outcomes assessment and the frequency of evaluation is described by the following table. Based on the results of the outcomes, an improvement plan is generated.

Section 3.1

Table 4: Summary data tables for SLOs: 2017-2018

Assessment	Assessment Method	Frequency of Assessment	Data Collected Media	How Collected	From Whom Collected	Responsible for Collection	Who Evaluates Data	Frequency of Evaluation
Direct Measure	Course Level Learning Outcomes Assessment	Once per year	Exams/ HomeWorks/ assignments/ projects	Paper/online	Students	Course Instructor	Course Instructor	Once per year
	Graduate Student Course Evaluations	Once per year	Surveys	Online	Students	Course Instructor	Course Instructor	Once per year
Indirect Measure	Graduate Students Exit Survey	Twice per year (Fall and Spring)	Surveys	Online	Students	Dept. Chair/Graduate Coordinator	Dept. Chair/Graduate Coordinator/Advisory board	Once per year
	Graduate Employers Survey	Once every three years	Surveys	Online	Employers of CM Graduates	Dept. Chair/Graduate Coordinator/Advisory board	Dept. Chair/Graduate Coordinator/Advisory board	Once every three years
	Graduate Alumni Survey	Once every three year	Surveys	Online	CM Alumni	Dept. Chair/Graduate Coordinator/Advisory board	Dept. Chair/Graduate Coordinator/Advisory board	Once every three year

Section 3.2 Summary of SLOs accomplishment and improvement plan (2017/2018)

Table 5: Summary of SLOs Accomplishment measure by Course Level Outcome Assessment method and Improvement Plan

SLO#	Target average score for the SLO	Achieved average score for the SLO	Improvement Plan for the SLO
SLO1	85.0	94.2	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO2	85.0	92.3	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO3	85.0	92.7	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO4	85.0	97.6	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO5	85.0	95.8	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO6	85.0	92.0	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO7	85.0	85.0	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO8	85.0	91.1	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO9	85.0	88.9	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.
SLO10	85.0	91.4	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome.

Section 3.3: Summary data tables for SLOs: How SLOs is assessed (2023)

Each program learning outcome is assessed annually through course level learning outcomes and graduate students exit survey once every three years. It is also assessed once in three years through Employer surveys and Alumni surveys. Quality plan is implemented through outcomes assessment and the frequency of evaluation is described by the following table. Based on the results of the outcomes an improvement plan is generated.

Table 6: Details of the Program Quality Improvement Plan used for the MS CM program.

Assessment	Assessment Method	Frequency of Assessment	Data Collected Media	How Collected	From Whom Collected	Responsible for Collection	Who Evaluates Data	Frequency of Evaluation
Direct Measure	Program Level Outcome Assessment (Students Learning Outcome)	Once per year	Students work	Paper or Online	Students	Faculty	Faculty	Once every three years

Feedback	Course Evaluation	Once per year	Students course evaluation	Online	Students	Faculty	Faculty	Once per year
Indirect Measure	Graduate (MS Program) Exit Surveys	Once per year	Surveys	Online	Graduating Students	Graduate Coordinator	Graduate Coordinator/ Dept. Chair	Once per year
Feedback	Employer Surveys	Once every five years	Surveys	Online	Employers of CM graduates	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every six years
Feedback	Alumni Surveys	Once every five years	Surveys	Online	CM Alumni	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every six years
Feedback	Faculty Feedback	Once every five years	Surveys and /or Program meeting	Online	Faculty	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every three years
Feedback	Industry Advisory Board Feedback	Once every five years	Surveys	Online	Industry advisory members	Graduate Coordinator/D ept. Chair	Graduate Coordinator/D ept. Chair	Once every three years

Section 3.4 Summary of SLOs accomplishment and improvement plan (2023)

Table 7: SLOs accomplishment and improvement plan (2023)

SLO #	Target average score for the SLO	Achieved average score for the SLO	Improvement Plan for the SLO
SLO1	90	92.49	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO2	90	95.46	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO3	90	93.66	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO4	90	93.22	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO5	90	90.83	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO6	90	90.43	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO7	90	94.52	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO8	90	96.33	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO9	90	94.93	Since the target is met, faculty will continue to monitor the performance of the students to ensure the accomplishment of the outcome
SLO10	90	92.21	Since the target is met, faculty will continue to monitor

			the performance of the students to ensure the accomplishment of the outcome
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Section 4: A discussion of the results, trends over time, and how the program has used the data to engage in continuous improvement (the program improvements made based on assessment findings).

Section 4.1: Discussion of the results, trends over time of SLO

For the years 2017-2018 in Figure 1, comparing the target average scores and the achieved average scores for Programs Student Learning Outcomes (SLOs), labeled SLO1 through SLO10. The target average scores are shown in blue color and the achieved average scores are shown in orange color. The target average scores are 85%. This shows that for each SLO, the actual performance exceeded the set targets. This suggested increasing rigor.

For the year 2023 in Figure 2, comparing the target average scores and the achieved average scores for SLOs, from SLO1 through SLO10. The target average scores are shown in blue color and the achieved average scores are shown in orange color. The target average scores are 90%. It appears that for most SLOs, the achieved scores are more than the target scores. Again, increasing rigor is suggested.

Target average scores for SLOs from 2017-2018 and 2023 are shown in Figure 3. The blue bars represent the target average scores for 2017-2018, while the orange bars show the target average scores for 2023. It is evident from the chart that the targets for 2023 are consistently higher across all SLOs (90%) compared to the targets set in 2017-2018 (85%).

The trends over time average scores for SLOs from 2017-2018 and 2023 are shown in Figure 3. The blue bars represent the achieved average scores for 2017-2018, while the orange bars show the achieved average scores for 2023. Trend of SLOs 2, 3, 7, 8, 9, 10 in 2023 are higher than 2017-2018 (i.e., improved). Even though the comparison data of 2023 is lower on SLOs 1, 4, 5, and 6, these data are scored more than 90%, which is higher than target value of 90%

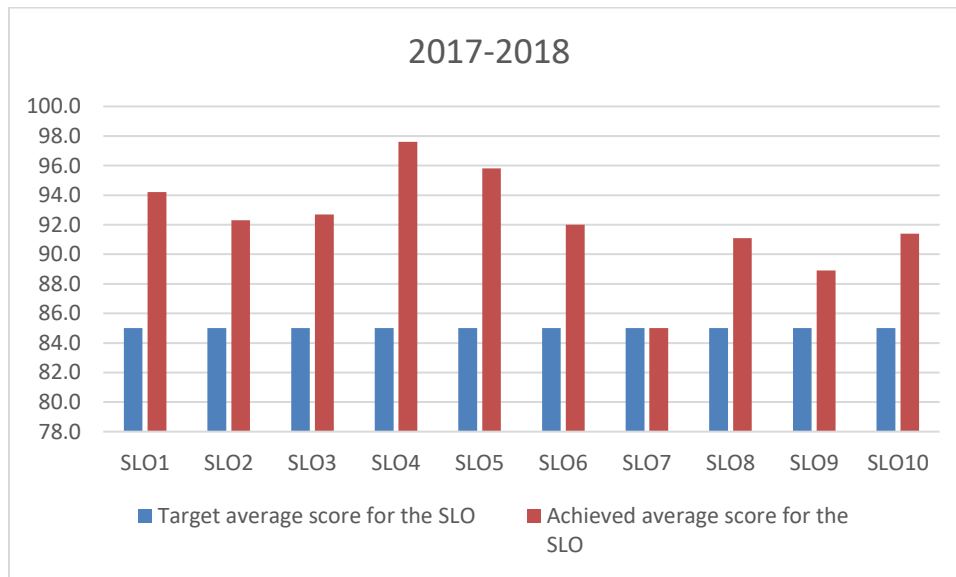


Figure 1: Comparing the target average scores and the achieved average scores for SLO (2017 -2018)

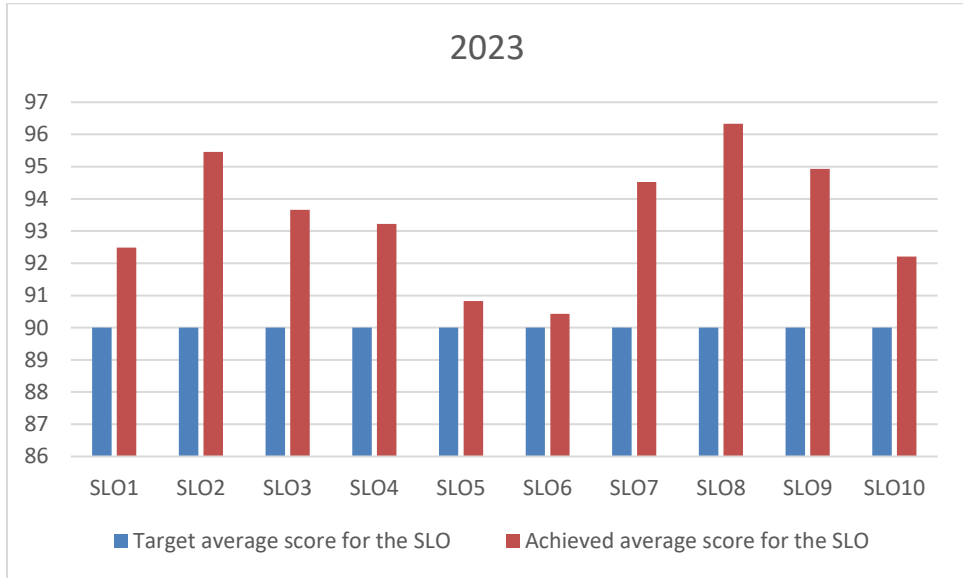


Figure 2: Comparing the target average scores and the achieved average scores for SLO (2023)

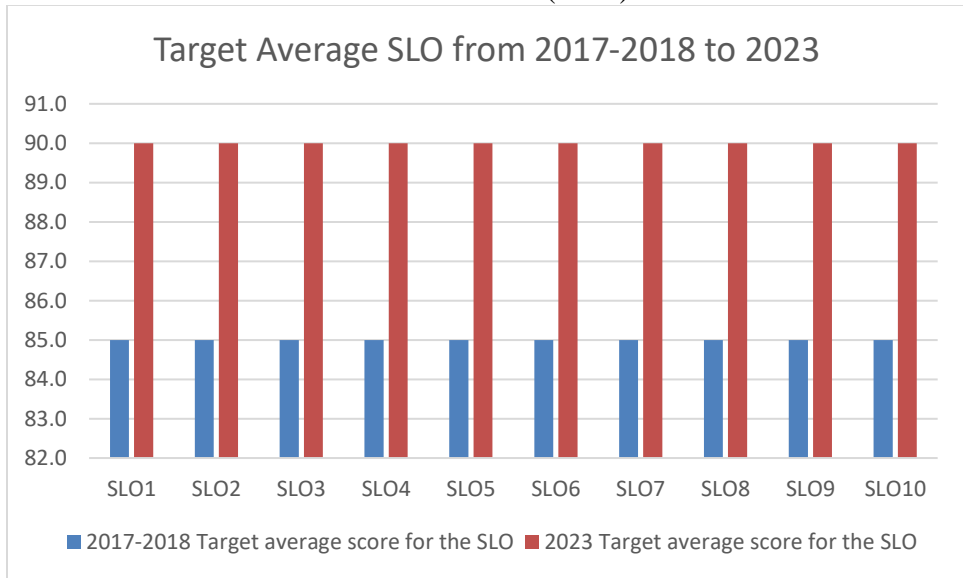


Figure 3: Target SLO score comparison (2017-2018 vs. 2023)

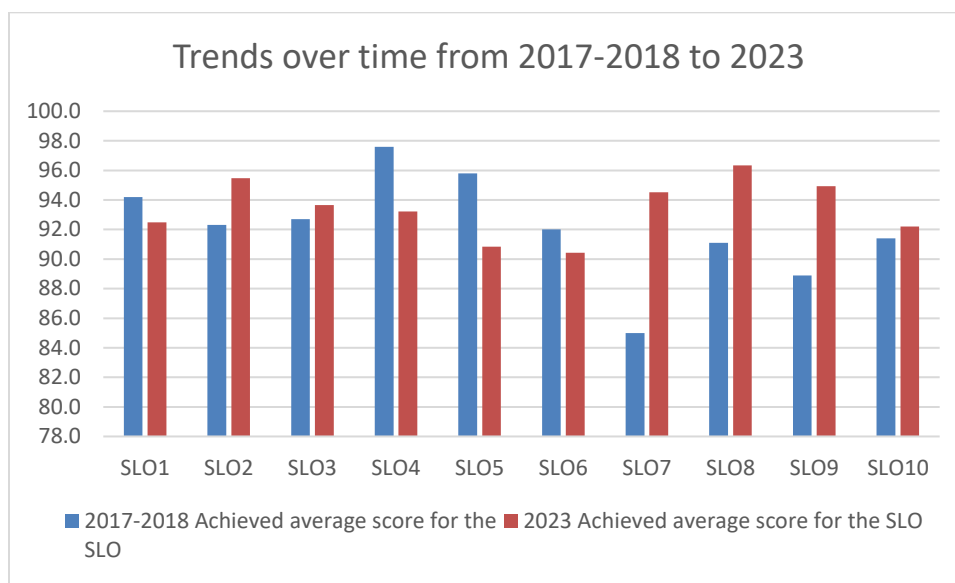


Figure 4: Average SLO scores comparison (2017-2018 vs. 2023)

Section 4.2: Use of data on program in continuous improvement

SLOs achievement is measured through two methods: (1) Course Learning Outcomes Assessment and (2) Graduate Student Exit Survey. The graduate alumni survey and graduate employers survey were also conducted during 2023 as per the frequency specified in the QIP.

At the beginning of the assessment cycle, the Graduate Program Coordinator in consultation with Graduate faculty, CM IAB - Graduate Program Committee, and Department Chair set each SLO target achievement value at 85% (2017-2018) and 90% (2023). Instructors used this target value to set the target achievement value of mapped CLOs. The instructors also finalized the assessment tools required to assess the CLOs achievement. During the semester, the instructors assessed the level of achievement of CLOs through different assessment tools and collected course assessment data. The instructors determined the level of achievement of CLOs. The achieved levels were compared with target levels. After reviewing this data and course evaluations the instructors suggest the improvement plan as listed under the “Improvement Plan for the CLO” column. This assessment data is forwarded to the Graduate Program Coordinator. The Graduate Program Coordinator determines each SLO achievement by calculating the mean of “Achieved class average score for the CLO” assessment tools of various courses contributing to the SLO.