METHODIST COLLEGE OF ENGINEERING AND TECHNOLOGY

King Koti, Abids, Hyderabad-500001

CO - PO/PSO & PEO ASSESSMENT AND ATTAINMENT PROCESS MANUAL

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1. INSTITUTE VISION AND MISSION

VISION

To produce ethical, socially conscious and innovative professionals who would contribute to sustainable technological development of the society.

MISSION

M1: To impart quality engineering education with latest technological developments and interdisciplinary skills to make students succeed in professional practice.

M2: To encourage research culture among faculty and students by establishing state of art laboratories and exposing them to modern industrial and organizational practices.

M3: To inculcate humane qualities like environmental consciousness, leadership, social values, professional ethics and engage in independent and lifelong learning for sustainable contribution to the society.

2. DEPARTMENTAL VISION AND MISSION

2.1. DEPARTMENT OF ECE

VISION

To strive to become centre of excellence in Education, Research with moral, ethical values and serve society.

MISSION

M1: To provide Electronics & Communication Engineering knowledge for successful career either in industry and research.

M2: To develop Industry-Interaction for innovation, product oriented research and development.

M3: To facilitate value added education combined with hands-on training.

2.2. DEPARTMENT OF EEE

VISION

To become a reputed centre for imparting quality education in Electrical and Electronics Engineering with human values, ethics and social responsibility.

MISSION

M1: To impart fundamental knowledge of Electrical, Electronics and Computational Technology.

M2: To develop professional skills through hands-on experience aligned to industry needs.

M3: To undertake research in sunrise areas of Electrical and Electronics Engineering.

M4: To motivate and facilitate individual and team activities to enhance personality skills.

2.3. DEPARTMENT OF CE

VISION

To evolve into a centre of excellence for imparting holistic civil engineering education contributing towards sustainable development of the society.

MISSION

M1: To impart quality civil engineering education blended with contemporary and interdisciplinary skills.

M2: To provide enhanced learning facilities and professional collaborations to impart a culture of continuous learning.

M3: To involve in trainings and activities on communication skills, teamwork, professional ethics, environmental protection and sustainable development.

2.4. DEPARTMENT OF CSE

VISION

To become a leader in providing Computer Science and Engineering education with emphasis on knowledge and innovation.

MISSION

M1: To offer flexible programs of study with collaborations to suit industrial needs

M2: To provide quality education and training through novel pedagogical practices

M3: To expedite high performance of excellence in teaching, research and innovations.

M4: To impart moral, ethical values and education with social responsibility.

2.5. DEPARTMENT OF MECHANICAL

VISION

To be a reputed centre of excellence in the field of mechanical engineering by synergizing innovative technologies and research for the progress of society.

MISSION

M1: To impart quality education by means of state-of-the-art infrastructure.

M2: To involve in trainings and activities on leadership qualities and social responsibilities.

M3: To inculcate the habit of life-long learning, practice professional ethics and serve the society.

M4: To establish industry- institute interaction for stakeholder development

2.6. DEPARTMENT OF MBA

VISION

Our vision is to be the most credible and admired leader in business education.

MISSION

M1: Committed in providing excellent academic delivery and infrastructure to the students.

M2: Imparting knowledge and skills in management for providing socially conscious and globally relevant thought leaders.

M3: To drive towards contemporary wisdom in management for producing professionals of character and confidence to address the challenges posed by dynamic business environment.

M4: Nurturing future executives and entrepreneurs who can make a valuable difference in the corporate world and society.

M5: To strive for excellence in research and innovation with the aim of providing opportunities for students, faculty and all the stakeholders in building a sustainable, peaceful and prosperous world.

Process for Defining Vision and Mission of the Department

Steps for Defining Vision and Mission of the Department

The process for defining Vision and Mission of the Department was discussed and formulated through a consultative process involving the stakeholders of the department. The department vision and mission process flow chart is as shown in Figure 1. In formulating the Vision and Mission of the Department, the following steps are followed:

1. Vision and Mission of the college and sample Vision & Mission statements of other institutions are taken as reference.
2. Views are taken from various internal stakeholders of the Department such as students and faculty members through SWOC.
3. With step 1 and 2 the draft vision mission of the department were formulated by Program Assessment Committee and shared with external stakeholder through various meetings for their inputs/suggestions.
4. The Department Committee (DC) reviews the draft Vision and Mission of the department and checks the consistency with the Vision and Mission of the Institute and sends the same to Department Advisory Committee (DAC) for any refinement of the statements.
5. DC finalises Vision and Mission statements and sends the same to Principal for approval.
6. Vision and Mission statements of the department are published, displayed and disseminated among Stakeholders.

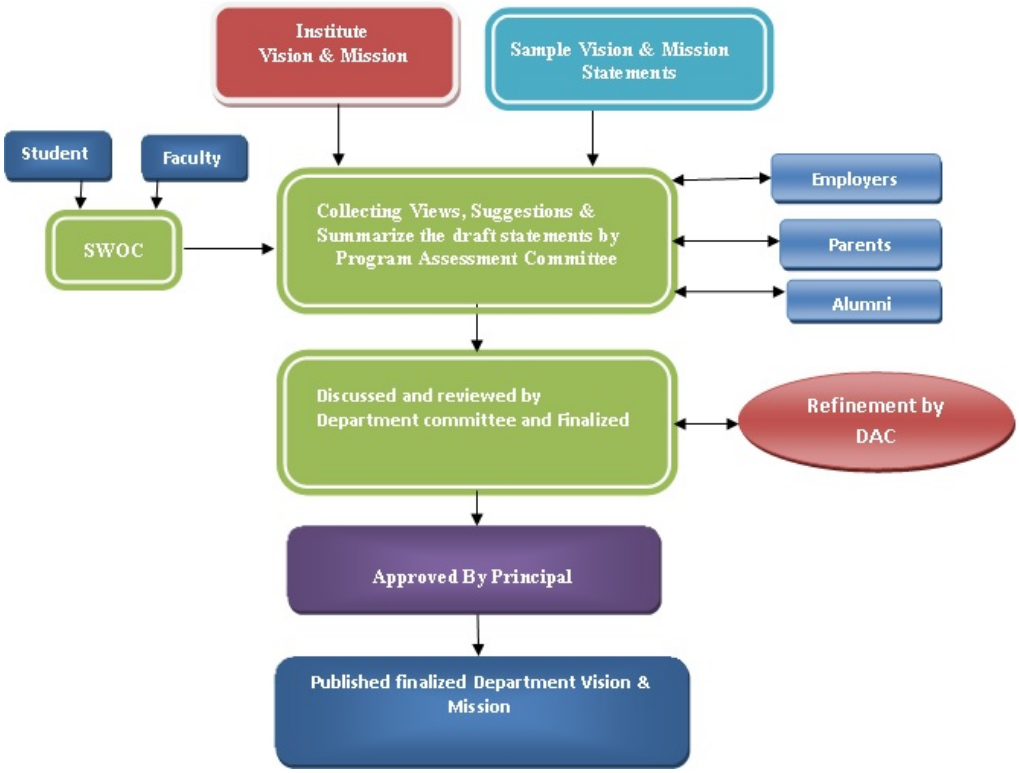


Fig.1 : Department Vision and Mission process flowchart

3. PROGRAM EDUCATIONAL OBJECTIVES, PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

Program Educational Objectives (PEOs):

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

Program Outcomes (POs):

Program outcomes describe what students are expected to know and would be able to do by the time of graduation. These relate to the skills, knowledge, and behaviours that students acquire as they progress through the program.

Program Specific Outcomes (PSOs):

Program Specific Outcomes are statements that describe what the graduates of a specific engineering program should be able to do

3.1 PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

Steps for Defining Program Educational Objectives for the Program

The process for defining PEOs were discussed and formulated through a consultative process involving the stakeholders of the department. The PEOs process flow chart as shown in Figure 2.

1. Vision and Mission of the institute, department and graduate attributes/POs are taken as reference for framing PEOs.
2. Views are taken from various internal stakeholders of the Department such as students and faculty members through SWOC and draft PEOs statements were framed.
3. With step 1 and 2 the draft PEOs were formulated by Program Assessment committee and shared with external stakeholder through various meetings for their inputs/ suggestions.
4. The Department Committee (DC) reviews the draft PEOs and sends the same to Department Advisory Committee (DAC) for any refinement of the statements.

5. DC finalizes PEOs and sends the same to Principal for approval.
6. PEOs were published, displayed and disseminated among Stakeholder

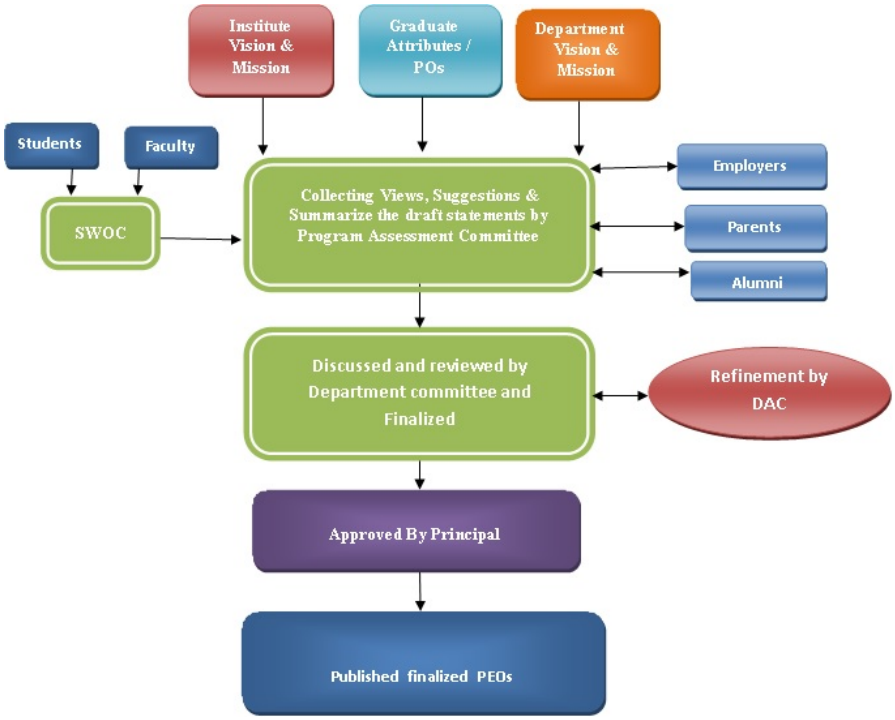


Fig.2 PEOs Process Flowchart

3.1.1 PEOs of ECE:

PEO1: Apply the knowledge of Basic sciences and Engineering in designing and implementing the solutions in emerging areas of Electronics and Communication Engineering.

PEO2: Pursue the research or higher education and practise profession.

PEO3: Adapt to the technological advancements for providing the sustainable engineering solutions to meet organisation/society needs.

PEO4: Work as an individual or in a team with professional ethics and values.

3.1.2 PEOs of EEE:

PEO1. Utilise domain knowledge required for analysing and resolving practical Electrical Engineering problems.

PEO2.Willing to undertake inter-disciplinary projects, demonstrate the professional skills and flair for investigation.

PEO3. Imbibe the state of the art technologies in the ever transforming technical scenario.

PEO4. Exhibit social and professional ethics for sustainable development of the society.

3.1.3 PEOs of CE:

PEO 1: Engage in planning, analysis, design, construction, operation and maintenance of built environment.

PEO 2: Apply the knowledge of civil engineering to pursue research or to engage in professional practice.

PEO 3: Work effectively as individuals and as team members in multidisciplinary projects with organisational and communication skills.

PEO 4: Demonstrate the spirit of lifelong learning and career enhancement aligned to professional and societal needs.

3.1.4 PEOs of CSE:

PEO 1: Apply technical concepts, analyse, synthesize data to design and create novel products and solutions for the real life problems.

PEO 2: Apply the knowledge of computer science Engineering to pursue higher education with due consideration to environment and society.

PEO 3: Promote collaborative learning and spirit of team work through multidisciplinary projects.

PEO 4: Engage in life-long learning and develop entrepreneurial skills.

3.1.5 PEOs of MECH:

PEO1: Excel as engineers with technical skills, and work with complex engineering systems

PEO2: Capable to be entrepreneurs, work on global issues, and contribute to industry and society through service activities and/or professional organizations.

PEO3: Lead and engage diverse teams with effective communication and managerial skills

PEO4: Develop commitment to pursue life-long learning in the chosen profession and/or progress towards an advanced degree

3.1.6 PEOs of ME(CAD/CAM):

PEO 1: Become a source of innovative solutions to complex problems related to computer aided design, simulation & manufacturing, and pursue successful career in the field of Mechanical Engineering.

PEO 2: Apply modern computational, analytical, simulation tools and techniques to address the technical challenges in manufacturing industries.

PEO 3: Work individually and also in teams; gain trust and respect of others as effective and ethical team member.

PEO 4: Development in the chosen profession by continuously updating the knowledge and progress towards an advanced degree.

3.1.7 PEOs of MBA:

PEO1: Transform as effective management professionals.

PEO2: Equip with the required academic knowledge, communication skills, creativity, critical thinking, responsibility, team work & leadership skills.

PEO3: Adapt to a rapidly changing environment.

PEO4: Resolve complex business problems with rational approach.

PEO5: Execute code of ethics, value based business, corporate social responsibility and lifelong learning.

3.2 PROGRAM OUTCOMES (POs):

3.2.1 POs of ECE,EEE,CE,CSE and MECH:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of electrical and electronics engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex electrical and electronics engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex electrical and electronics engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex electrical and electronics engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional electrical and electronics engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO.8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the electrical and electronics engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

3.2.2 POs of ME(CAD/CAM):

PO1: Demonstrate and apply the knowledge of CAD/CAM Simulation tools and techniques to address problems related to mechanical engineering.

PO2: Independently carry out research /investigation and development work to solve practical problems

PO3: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO4: Write and present a substantial technical report/document.

3.2.3 POs of MBA:

PO1: Acquire adequate knowledge of management theories & practices to take initiative in achievement of organisational goals with effective team spirit.

PO2: Enhancing analytical and critical thinking abilities to solve complex business problems with stimulus to information driven decision making.

PO3: Incorporate excellent communication skills and demonstrate ethically sound leadership qualities with high degree of social consciousness.

PO4: Recognise the need for research and innovation to comprehend a growingly uncertain business environment.

PO5: Possess self-sustaining entrepreneurship qualities by engaging in independent and lifelong learning.

3.3 PROGRAM SPECIFIC OUTCOMES (PSOs):

3.3.1 PSOs of ECE:

PSO1: Professional Competence: Apply the knowledge of Electronics & Communication Engineering principles in VLSI, Signal processing , Communication, Embedded system & Control Engineering.

PSO2: Technical Skills: Design and implement products using the cutting- edge software and hardware tools.

PSO3: **Social consciousness**: Demonstrate the leadership qualities and strive for the betterment of organisation, environment and society.

3.3.2 PSOs of EEE:

PSO1: Provide effective solutions in the fields of Power Electronics, Power Systems and Electrical Machines using MATLAB/MULTISIM.

PSO2: Design and Develop various Electrical and Electronics Systems, particularly Renewable Energy Systems.

PSO3: Demonstrate the overall knowledge and contribute for the betterment of the society.

3.3.3 PSOs of CE:

PSO1: Investigate properties of traditional and latest construction materials using standard testing methods.

PSO2: Use AutoCAD, STAAD Pro, ETABS, Revit Architecture and ANSYS software for computer aided structural analysis and design.

PSO3: Describe the principles of sustainable development and green buildings for environmental preservation.

3.3.4 PSOs of CSE:

PSO1: Apply the knowledge of Computer Science and Engineering in various domains like networkinganddataminingtomanageprojectsin multidisciplinary environments.

PSO2: Develop software applications with open-ended programming environments.

PSO3: Design and develop solutions by following standard software engineering principles and implement by using suitable programming languages and platforms.

3.3.5 PSOs of MECH:

PSO1: Apply the knowledge of CAD/CAM/CAE tools to analyse, design and develop the products and processes related to Mechanical Engineering.

PSO 2: Solve problems related to mechanical systems by applying the principles of modern manufacturing technologies.

PSO 3: Exhibit the knowledge and skill relevant to HVAC and IC Engines.

3.3.6 PSOs of MBA:

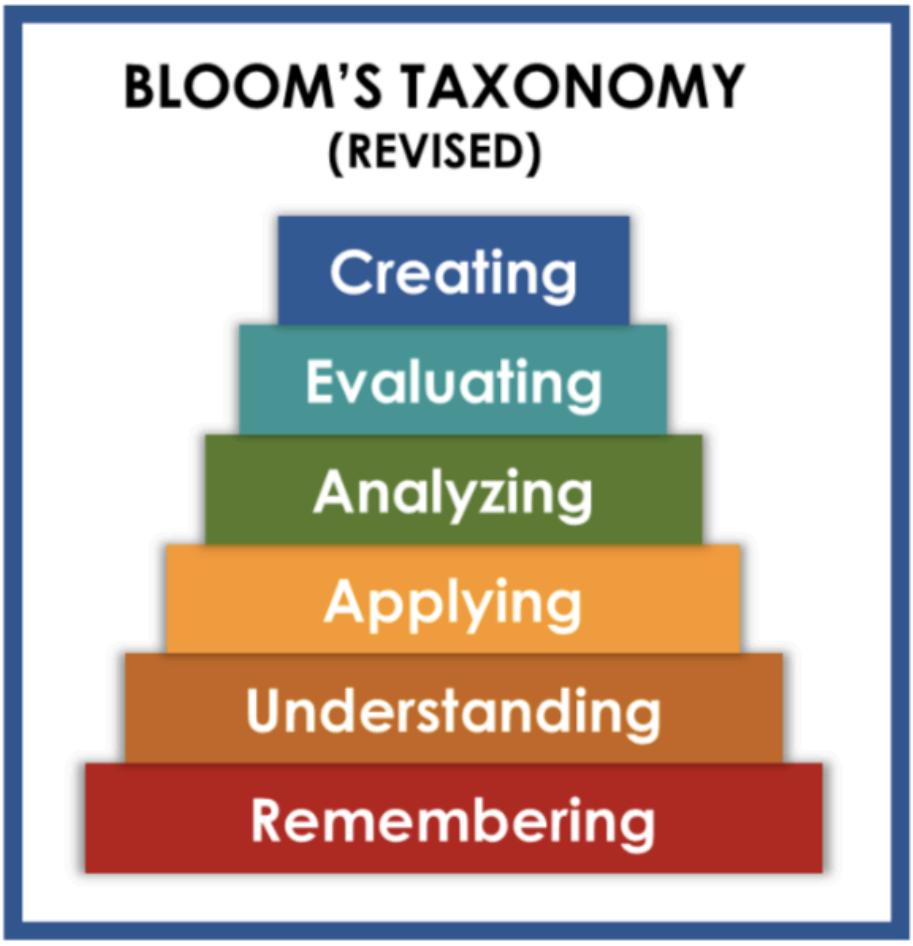
PSO1: Applying the knowledge of management to optimally solve complex business problems.

PSO 2: Developing the ability to gain multidisciplinary knowledge through case analysis, projects and internships.

PSO 3: Demonstrate social responsibility with emphasis on ethical values and standards.

4. BLOOM'S TAXONOMY

Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. It is most often used when designing educational, training, and learning processes.



Bloom's Taxonomy is hierarchical, which means that learning at a higher level requires the skills at the lower level are attained.

REVISED Bloom's Taxonomy Action Verbs

Definitions	I. Remembering	II. Understanding	III. Applying	IV. Analyzing	V. Evaluating	VI. Creating
Bloom's Definition	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.
Verbs	• Choose • Define • Find • How • Label • List • Match • Name • Omit • Recall • Relate • Select • Show • Spell • Tell • What • When • Where • Which • Who • Why	• Classify • Compare • Contrast • Demonstrate • Explain • Extend • Illustrate • Infer • Interpret • Outline • Relate • Rephrase • Show • Summarize • Translate	• Apply • Build • Choose • Construct • Develop • Experiment with • Identify • Interview • Make use of • Model • Organize • Plan • Select • Solve • Utilize	• Analyze • Assume • Categorize • Classify • Compare • Conclusion • Contrast • Discover • Dissect • Distinguish • Divide • Examine • Function • Inference • Inspect • List • Motive • Relationships • Simplify • Survey • Take part in • Test for • Theme	• Agree • Appraise • Assess • Award • Choose • Compare • Conclude • Criteria • Criticize • Decide • Deduct • Defend • Determine • Disprove • Estimate • Evaluate • Explain • Importance • Influence • Interpret • Judge • Justify • Mark • Measure • Opinion • Perceive • Prioritize • Prove • Rate • Recommend • Rule on • Select • Support • Value	• Adapt • Build • Change • Choose • Combine • Compile • Compose • Construct • Create • Delete • Design • Develop • Discuss • Elaborate • Estimate • Formulate • Happen • Imagine • Improve • Invent • Make up • Maximize • Minimize • Modify • Original • Originate • Plan • Predict • Propose • Solution • Solve • Suppose • Test • Theory

Anderson, L. W., & Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing, Abridged Edition. Boston, MA: Allyn and Bacon.

5. COURSE OUTCOMES

Course Outcomes (COs) are clear statements of what a student should be able to demonstrate upon completion of a course. They should be assessable and measurable knowledge, skills, abilities or attitudes that students attain by the end of the course. Faculty are advised to identify 6 course outcomes of good quality for each course.

Guidelines for faculty to write Course outcomes:

1. Course outcome should start with an *action verb of Blooms's taxonomy*
2. Course outcome should end with domain/course learning
3. Taxonomy level should be identified from the new taxonomy (Remember, Understand, Apply, Analyze, Evaluate and Create).
4. Mention the highest taxonomy incase CO has 2 action verbs (as taxonomy is hierarchical).
5. Assign unique number to each CO (such that all courses COs can be consolidated).
6. Verify the quality of COs with the help of checklist provided.

Assumptions:

- Considering at-least one CO for each unit of the syllabus.
- There need NOT be one to one correspondence between units of a course and the COs
    - A Unit can be addressed by more than one CO
    - A CO can address topics from more than one unit
    - Entire syllabus should be covered when all COs are consolidated.

SAMPLE CO STATEMENTS:

Course: Surveying and Geomatics

Course Code: PC 223 CE

On successful completion of this course, students should be able to:

CO No.	Course Outcome	Taxonomy Level
223.1	**Explain** the terminologies and concepts involved in basic and modern surveying equipments & technologies and also defines the concepts of horizontal and vertical curves.	**Understanding**
223.2	**Demonstrate** the working principles and applications of basic and modern surveying instruments like chain, prismatic compass, plane table, dumpy level, theodolite and total station.	**Understanding**
223.3	**Apply** the knowledge of surveying & levelling in calculating lengths, bearings, reduced levels, elevation differences and plotting of a ground	**Applying**
223.4	**Apply** the knowledge of theodolite and trigonometry in finding horizontal and vertical angles, heights of inaccessible points	**Applying**
223.5	**Make use of** knowledge of curves concept in surveying, in setting out both horizontal and vertical curves for the purpose of roadway and railway alignment	**Applying**
225.6	**Analyse** the amount of closing error of a traverse after finding out the omitted measurements in traverse and compute the missing data	**Analysing**

6. CO – PO AND CO – PSO MAPPING OF COURSES

All the courses together must cover all the POs (and PSOs). For a course we map the COs to POs through the CO-PO matrix and to PSOs through the CO-PSO matrix. The various correlation levels are:

"1" - Low Correlation

"2" – Moderate Correlation

"3" – High Correlation

"-" indicates there is no correlation.

6.1 Process involved in CO-PO Mapping

The role of CO-PO mapping will be assigned to the faculty. After the course (subject) allotment from the department, the course in-charge of the course has to write appropriate COs for their corresponding course. It should be narrower and measurable statements. By using the action verbs of learning levels, CO's will be designed. CO statements should describe what the students are expected to know and able to do at the end of each course, which are related to the skills, knowledge and behaviour that students will acquire through the course.

After writing the CO statements, CO will be mapped with PO of the department. If the department is having more than one section in a year or the same course is available for more than one program of the same institute in a semester, the subject expert will be nominated as course coordinator of the corresponding course. The role of the course coordinator is to review the CO statements and the CO-PO mapping which has been done by course in-charge. The year wise coordinator has to consolidate the CO's of the respective year and maintain the documentation of the CO attainment level of the respective year courses.

CO-PO MAPPING SCHEME

Steps for Mapping

1) Establishing Correlation between COs and POs.

- Match the **contents** of the CO with the **contents** of the POs for correlation.
- Ensure the particular CO is fulfilling the **objective** of the POs or at least moving towards that objective.
- For this one must go through the POs carefully and use the PO Analysis Table to identify the contents and intent

2) Assigning Weight to the particular CO-PO Mapping (0/1/2/3)

- Once correlation is established, a weight has to be assigned to every CO-PO mapping. The weight levels are as follows:
  - Weight = 3 implies "High correlation"
  - Weight = 2 implies "Moderate correlation"
  - Weight = 1 implies "Low correlation"
- To identify the level of correlation, **BLOOM'S TAXONOMY** is used.
- Match the Taxonomy Levels of the COs and the Maximum Intended Taxonomy Level of the POs. Use the PO Analysis Table to identify the maximum intended Taxonomy Level of the PO. The following mapping weight formula may be used:

MAPPING WEIGHTAGE FORMULA

CO Taxonomy Level - PO Taxonomy Level

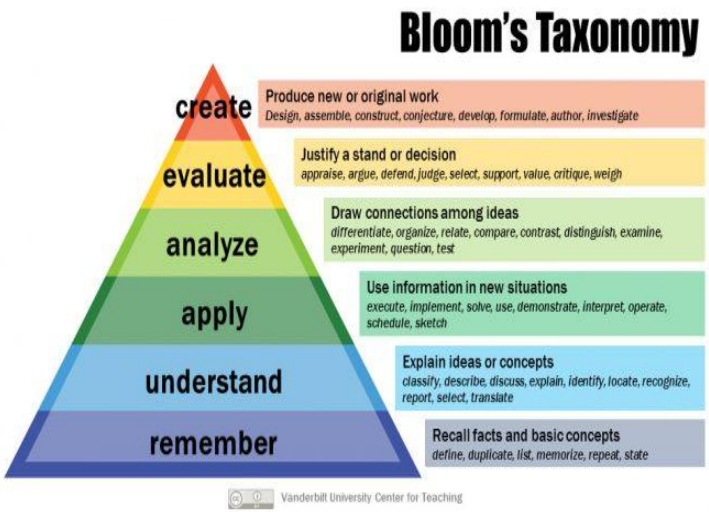
= Positive, then strongly mapped; Weight = 3

= 0, then exactly mapped; Weight = 3

= -1, then nearly mapped; Weight = 2

= -2, then remotely mapped; Weight = 1

< -2, then poorly mapped; Weight = 0



Blooms' Taxonomy Levels:

Remember = 1

Understand = 2

Apply = 3

Analyze = 4

Evaluate = 5

Create = 6

Sample Tables to Illustrate Mapping Weights

CO Taxonomy Level = Remember (1)

CO Taxonomy Level	PO Taxonomy Level	CO Level - PO Level	Mapping Weight
Remember (1)	Remember (1)	0	3
Remember (1)	Understand (2)	-1	2
Remember (1)	Apply (3)	-2	1
Remember (1)	Analyze (4)	-3	0
Remember (1)	Evaluate (5)	-4	0
Remember (1)	Create (6)	-5	0

CO Taxonomy Level = Understand (2)

CO Taxonomy Level	PO Taxonomy Level	CO Level - PO Level	Mapping Weight
Understand (2)	Remember (1)	1	3
Understand (2)	Understand (2)	0	3
Understand (2)	Apply (3)	-1	2
Understand (2)	Analyze (4)	-2	1
Understand (2)	Evaluate (5)	-3	0
Understand (2)	Create (6)	-4	0

CO Taxonomy Level = Apply (3)

CO Taxonomy Level	PO Taxonomy Level	CO Level - PO Level	Mapping Weight
Apply (3)	Remember (1)	2	3
Apply (3)	Understand (2)	1	3
Apply (3)	Apply (3)	0	3
Apply (3)	Analyze (4)	-1	2
Apply (3)	Evaluate (5)	-2	1
Apply (3)	Create (6)	-3	0

CO Taxonomy Level = Analyze (4)

CO Taxonomy Level	PO Taxonomy Level	CO Level - PO Level	Mapping Weight
Analyze (4)	Remember (1)	3	3
Analyze (4)	Understand (2)	2	3
Analyze (4)	Apply (3)	1	3
Analyze (4)	Analyze (4)	0	3
Analyze (4)	Evaluate (5)	-1	2
Analyze (4)	Create (6)	-2	1

CO Taxonomy Level = Evaluate (5)

CO Taxonomy Level	PO Taxonomy Level	CO Level - PO Level	Mapping Weight
Evaluate (5)	Remember (1)	4	3
Evaluate (5)	Understand (2)	3	3
Evaluate (5)	Apply (3)	2	3
Evaluate (5)	Analyze (4)	1	3
Evaluate (5)	Evaluate (5)	0	3
Evaluate (5)	Create (6)	-1	2

CO Taxonomy Level = Create (6)

CO Taxonomy Level	PO Taxonomy Level	CO Level - PO Level	Mapping Weight
Create (6)	Remember (1)	5	3
Create (6)	Understand (2)	4	3
Create (6)	Apply (3)	3	3
Create (6)	Analyze (4)	2	3
Create (6)	Evaluate (5)	1	3
Create (6)	Create (6)	0	3

ENGINEERING
PROGRAM OUTCOMES

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Analysis of POs

	Key Emphasis	Maximum Taxonomy Level (Skills as Action Verbs)	Object to be used (Action on what?)	Objective (Action for what?)
PO1	**Engineering knowledge**:	**TL = 3: Applying** (Verbs: Apply)	{Apply} Knowledge of mathematics, science, engineering fundamentals, and an engineering specialization	Apply **Engineering Knowledge** to solve complex engineering problems.
PO2	**Problem analysis**:	**TL = 4: Analyzing** (Verbs: Analyze) TL = 3: Applying (Verbs: Identify, formulate, review, use)	**{**Analyze**}** (i) complex engineering problems {Identify, formulate, review} (ii) research literature {Use} (iii) first principles of mathematics, natural sciences, and engineering sciences.	**Analyze** complex engineering problems reaching substantiated conclusions
PO3	**Design/development of solutions**:	**TL = 6: Creating** (Verbs: Design, Develop) TL = 5: Evaluating (Verbs: Consider, Evaluate)	{*Design*} (i) solutions for complex engineering problems (ii) system components (iii) processes meeting specific needs {*Evaluate*} (i) public health (ii) safety (iii) cultural (iv) societal (v)environmental considerations	**Design/develop solutions** for complex engineering problems and **design** system components or processes.
PO4	**Conduct investigations of complex problems**:	**TL = 5: Evaluating** (Verbs: Conclude or conclusion) TL = 3: Applying (Verbs: Use)	{*Use:*} Research based knowledge/methods (i) design of experiments (ii) analysis & (iii) data interpretation (iv) information synthesis {*Conclude:*} on the investigation	To conduct investigation of complex problems and to provide valid conclusions.

PO5	**Modern tool usage**:	**TL = 6: Creating** (Verbs: Create) TL = 5: Evaluating (Verbs: Create, Select) TL = 3: Applying (Verbs: Select, Apply) TL = 2: Understanding (Verbs: Understand)	{*Create, select, & apply:*} appropriate techniques, resources, and modern engineering and IT tools {*Understand:*} Limitations	Create, Select and Apply **modern tools** for prediction and modeling to complex engineering activities
PO6	**The engineer and society**:	**TL = 5: Evaluating** (Verbs: Assess) TL = 3: Applying (Verbs: Apply)	{Apply} (i) reasoning skills (ii) contextual knowledge {Assess} (i) societal, (ii) health, (iii) safety, (iv) legal and (v) cultural issues (vi) responsibilities related to engineering practice	**Assess** societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice by **applying** reasoning informed by the contextual knowledge.
PO7	**Environment and sustainability**:	**TL = 2: Understanding** (Verbs: Understand, demonstrate)	{Understand} the impact of the professional engineering solutions in societal and environmental contexts, **{** demonstrate **}** the knowledge of sustainable development	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**:	**TL = 3: Applying** (Verbs: Apply, commit)	{Apply} ethical principles {commit to} Professional ethics, responsibilities & norms of engineering practice.	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**:	**Function or Perform** Indirect Interpretation: **TL = 2: Understanding** (Verbs: Demonstrate)	{Function} (i) as an individual, (ii) as a member/leader in diverse teams (iii) in multidisciplinary settings.	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. Note: Student should **demonstrate** his ability to work individually and in a team, through group assignments, projects, technical activities, etc.

PO10	**Communication**:	**Communicate, Comprehend & write** Indirect Interpretation: **TL = 2: Understanding** (Verbs: Demonstrate)	{Communicate} (i) complex engineering activities (ii) with the engineering community (iii) with society at large, such as, {comprehend and write} (i) effective reports (ii) design documentation (iii) make effective presentations, (iv) give and receive clear instructions.	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. Note: Student should **demonstrate** his communication ability through assignment writing, report writing, seminar presentations, debates, Jam, soft-skill programs, etc.
PO11	**Project management and finance**:	**TL = 3: Applying** (Verbs: Apply) **TL = 2: Understanding** (Verbs: Understand, demonstrate)	{Demonstrate} knowledge and understanding of the engineering and management principles {Apply} The above to teamwork to manage projects in multidisciplinary environments	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**:	**Recognize, engage** Indirect Interpretation: **TL = 2: Understanding** (Verbs: Demonstrate)	(i) independent and life-long learning (ii) broadest context of technological change	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Note: Student should **demonstrate** his aptitude for life-long learning through participation in MOOCs, value-added courses, certification courses, professional memberships, innovations, etc.

* formulate: (synonyms) construct, make, develop [TL = 3]

6.2 SAMPLE CO-PO AND CO-PSO MAPPING:

Course: Surveying and Geomatics

Course Code: PC 223 CE

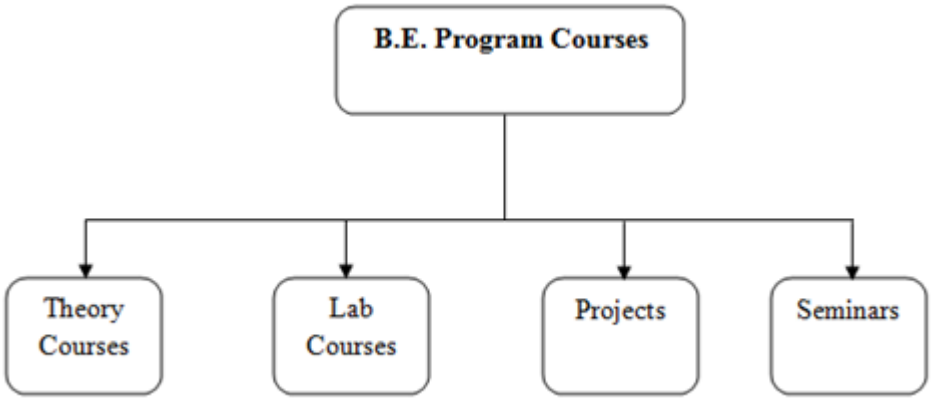
MAPPING OF COs WITH POs & PSOs (Curriculum):
Correlation Level: High – 3; Medium – 2; Low – 1

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS01	PSO2	PSO 3
C223.1	3	-	-	-	2	-	-	1	-	-	-	-	-	-	-
C223.2	3	1	-	-	2	-	-	1	-	-	-	-	-	-	-
C223.3	3	3	-	-	3	-	-	1	2	-	-	-	-	-	-
C223.4	3	3	-	-	3	-	-	1	2	-	-	-	-	-	-
C223.5	3	3	-	-	3	-	-	1	-	-	-	-	-	-	-
C223.6	3	3	-	2	3	-	-	1	-	-	-	-	-	-	-
C223	**3**	**2.6**	**-**	**2**	**2.6**	**-**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**

7. ASSESSMENT PROCESS

Attainment of CO Attainment Procedure:

Bachelor of Engineering program consists of a range of courses which are categorised as Theory courses, Lab courses, Projects, Seminar, Summer Internship.



Each of the course is assessed both using Direct Assessment Method and Indirect Assessment Method.

7.1. Direct Assessment of Theory Courses:

Direct Assessment process for theory courses involves Continuous Internal Evaluation (CIE) and Semester End Evaluation (SEE).

The scheme of evaluation and grading for each course is as shown below:

S. No	Component	Duration	Maximum Marks
	Continuous Internal Evaluation (CIE)		
1.	Internal Examination – I	60 minutes	20
2.	Internal Examination - II	60 minutes	20
	Average of the two internal exams		**20**
3.	Assignments	-	**5**
4.	Quizzes	-	**5**
	CIE (Total)		**30**
5.	**Semester End Examination (SEE)** (University Examination)	3 hours	**70**
		TOTAL	**100**

Marks	85-100	70 to <	60 to <	55 to <	50 to <	40 to <	< 40	Absent
Grade	S	A	B	C	D	E	F	Ab
Grade	10	9	8	7	6	5	0	-

In general, for theory courses the continuous internal evaluation (CIE) process consists of two Mid-term examinations of 20 marks each, which is split into the following set of questions.

Question Type	**No. of Questions**	**Marks per Question**	**Choices (Yes or No)**
Short Answers	4	2	No
Long Answers	2	6	Yes (Two Choices within each question)

Attainment of Course Outcomes (CO):

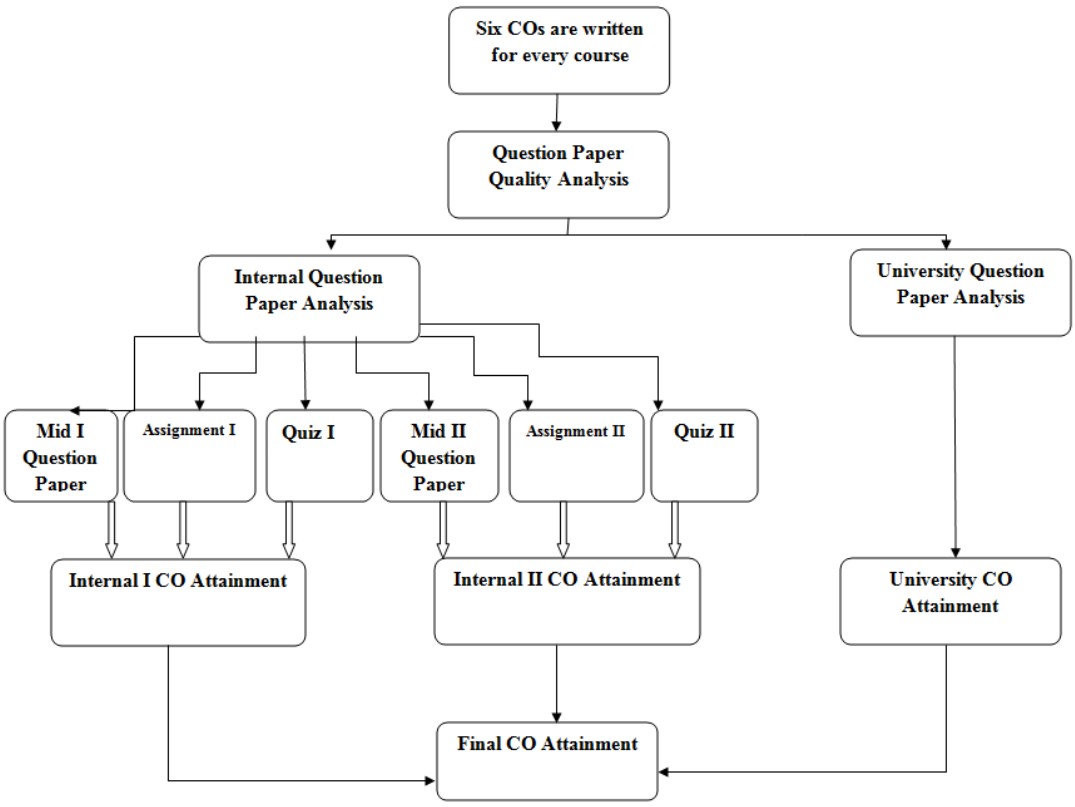
- Six COs are written for each course in which, the action verbs corresponding to the Bloom's taxonomy level for cognitive learning is identified and highlighted.
- Theory courses consists of continuous internal evaluation (CIE) process which has two Mid-term examinations of 20 marks each and Assignments and Quizzes of 5 marks each.
- Internal Question paper analysis is done in which, each question is mapped with a CO. The CO percentage score (representing the maximum extent to which the CO can be attained) is computed based on **the number of students attained base marks (50%) and the number of students attempted the question**. It is made sure that the entire six COs are covered in two internal examinations.
- Assignments and quizzes also cover the entire COs. The CO percentage score is computed same as above and is assigned to each question based on assignment and quiz question paper analysis done in prior.
- CO percentage scores for Internals are computed by taking the average of scores computed for mid-term examinations, assignments and quizzes.
- Since the Semester End Examination (SEE) is conducted by the Osmania University, there is no local control the question paper. However, University Question Paper analysis is being done to check whether six COs are addressed.

CO percentage scores for Semester End Examination (SEE) is also computed as above and is assigned to all the COs covered in the university question paper analysis.

Finally, the overall CO percentage score is computed by taking the average of Internal I, Internal II and Semester End Examinations. This score is finally converted to CO attainment rubric based on the following table.

CO Percentage score	CO attainment rubric
%CO ≥ 60	3
50 ≤ %CO < 60	2
%CO < 50	1

The following flow chart shows the process involved in CO attainments using Direct Method:



7.2 Indirect Assessment of Theory Courses:

In indirect assessment method, CO based feedback is collected from the students at the end of the semester, wherein students rate all COs of the course in a scale of 3.

Level of CO	Student Rating
Excellent	3
Satisfactory	2
Improvements required	1

Finally, for each course, based on the feedback obtained from the students, averages are calculated for each CO and overall course attainment is computed.

Sample of theory course attainment:

Methodist College of Engineering and Technology
Department of Civil Engineering

Course Attainment

Academic Year:

Course Name with Code	**PC302CE: STRENGTH OF MATERIALS – I**
Class	**B.E III Semester**
Faculty Name	**Dr. Akshay S. K. Naidu**

CO Attainment	Internal I	Internal II	University Examination	Overall (%)	Direct attainment (Rubric)	Indirect attainment	Over all (80% + 20%)
CO 1	63.94	62.03	38.71	50.85	2	2.60	2.12
CO 2	58.58	70.86	38.71	51.72	2	2.60	2.12
CO 3	67.47	71.9	38.71	54.20	2	2.60	2.12
CO 4	73.79	57.81	38.71	52.26	2	2.30	2.06
CO 5		67.2	38.71	52.96	2	2.30	2.06
CO 6		60.55	38.71	49.63	1	2.60	1.32
Overall Course Attainment				51.93			1.97
Set Target for the Course							1.73
Course Attainment Status(Yes/No)							Yes

CO Percentage	CO attainment
%CO ≥ 60	3
50 ≤ %CO < 60	2
%CO< 50	1

Best Performing COs	CO3
Least Performing COs	CO6

Observations:

1	The set target for the course is attained, because of giving enough number of assignments, practice questions and learning materials. However, attainment levels need to be improved.
2	The performance in the University Exams has to be improved, by giving some mock tests and giving enough practice of long answer questions and numerical problems.
3	CO6 addresses the ability of a student to design a structural member subject to various stresses. The attainment of this CO is the least, which shows that students did not have enough practice on design problems.

Plan of Action:

1	Students involvement in the learning process must be increased by adopting teaching strategies such as learning by doing, peer-teaching, group tasks & assignments, etc.
2	Students need to be given a greater number of practice and assessment tests that involve long duration so that the students get practiced to solve problems over a long duration of time.
3	Students need to be made to practice a greater number of problems which have long solutions, which are primarily asked in the University exams, and design oriented problems have to be practiced. Number of additional tutorial sessions and make-up classes may be required to address this.

7.3. Direct Assessment of Lab Courses:

Direct Assessment process for lab courses involves Continuous Internal Evaluation (CIE) and Semester End Evaluation (SEE).

The scheme of evaluation and grading for each course is as shown below:

S. No	Component	Duration	Maximum Marks
	Continuous Internal Evaluation (CIE)		
1.	Internal Examination – I	1 hours	25
	CIE (Total)		**25**
2.	**Semester End Examination** (University Examination)	3 hours	**50**
		TOTAL	**75**

Marks Range	85-100	70 to < 85	60 to < 70	55 to < 60	50 to < 55	40 to < 50	< 40	Absent
Grade	S	A	B	C	D	E	F	Ab
Grade Point	10	9	8	7	6	5	0	-

In general, for lab courses, the continuous internal evaluation (CIE) process consists of continuous evaluation sheets and internal examination, together constituting for 25 marks.

Attainment of Course Outcomes (CO):

- Six COs are written for lab course in which, the action verbs corresponding to the Bloom's taxonomy level for cognitive learning is identified and highlighted.
- Lab courses consist of continuous internal evaluation (CIE) process which has continuous evaluation sheets and internal examination, together constituting for 25 marks.
- Each experiment is mapped with a CO. The CO percentage score (representing the maximum extent to which the CO can be attained) is computed based on **the number of students attained base marks (50%) and the number of students attempted the question**. It is made sure that the entire six COs are covered in all the ten experiments.

- The Semester End Examination (SEE) is conducted by the faculty of the respective college under the supervision of External Examiner. CO percentage scores for Semester End Examination (SEE) is also computed as above and is assigned to all the COs.

Finally, the overall CO percentage score is computed by taking the average of continuous internal evaluation (CIE) and Semester End Examinations. This score is finally converted to CO attainment rubric based on the following table.

CO Percentage	CO attainment rubric
%CO ≥ 60	3
50 ≤ %CO < 60	2
%CO < 50	1

7.4. Indirect Assessment of Lab Courses:

In indirect assessment method, CO based feedback is collected from the students at the end of the semester, wherein students rate all COs of the course in a scale of 3.

Level of CO	Student Rating
Excellent	3
Satisfactory	2
Improvements required	1

Finally, for each course, based on the feedback obtained from the students, averages are calculated for each CO and overall course attainment is computed.

Sample lab course attainment sheet

Methodist College of Engineering and Technology
Department of Civil Engineering

Course Attainment

Academic Year

Course Name with Code	Surveying-II lab; PC453CE
Class	BE Civil IV Sem
Faculty Name	Shaik Mohammad Imran

CO Attainment	CIE	University Examination	Overall (%)	Overall (Rubric) Direct	CO Indirect	Final CO attainment
CO 1	100	95.93	97.96	3	2.60	2.92
CO 2	100	95.93	97.96	3	2.30	2.86
CO 3	100	95.93	97.96	3	2.30	2.86
CO 4	100	95.93	97.96	3	3.00	3.00
CO 5	100		100	3	2.60	2.92
CO 6	100		100	3	2.60	2.92
Overall Course Attainment						**2.91**
Set Target for the course						**2.11**
Course Attainment Status(Yes/No)						**Yes**

CO Percentage score	CO attainment rubric
%CO ≥ 60	3
50 ≤ %CO < 60	2
%CO < 50	1

7.5. Assessment of Project:

Process	Description of steps
Demonstration of project	At the beginning of the fourth year second semester, the students are ready to work on their project. The quality of the work is monitored on a fortnightly basis by a senior faculty member designated as a Project Coordinator along with project guide. Students make demonstrations of their work and quality of projects is evaluated by the Project Review Committee.
Final assessment	Final assessment is carried out by an External senior faculty appointed by the Board of Studies of the University. Grades, Excellent, Vry Good, Good and Satisfactory are awarded to the student's Project.
Project Evaluation	An internal assessment by the project review committee is done for 50 marks and external assessment is based on final grades given by external examiner allotted by Board of Studies.

Internal Assessment:

Note: 50 marks of Project are evaluated for the following

i.	Continuous Progress & Reporting
ii.	Project Review-1
iii.	Project Document (Dept. Prescribed Format)
iv.	Project Review-2 The quality of the project is assessed by the Review committee after giving due consideration to the above points.

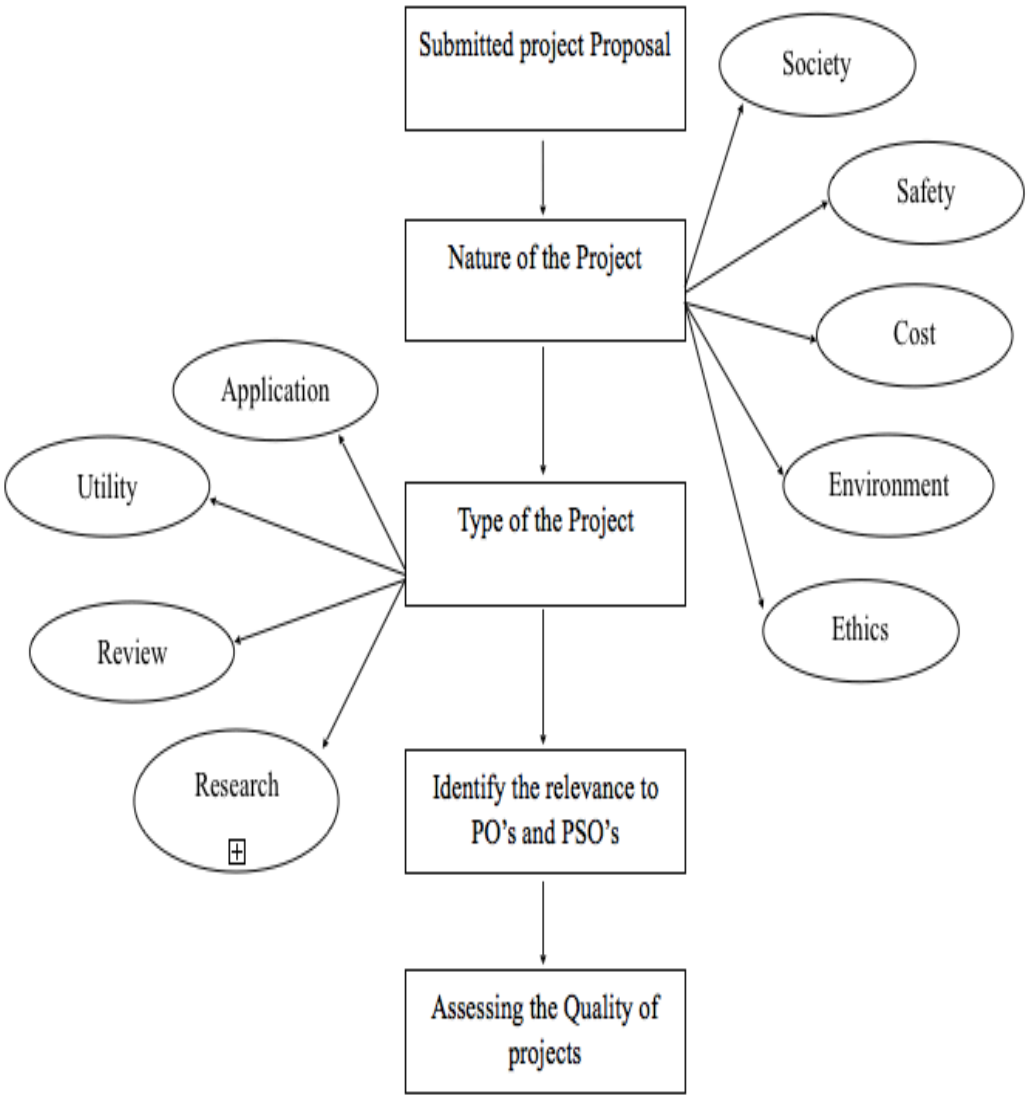
Process to assess student Projects:

Quality of the project is assessed in terms of area of project (application/ utility/review/ research) and the focused topics being literature survey, problem definition, environment safety and society, ethical responsibility, project presentation, cost and project management, research publications & Innovation.

The quality of the Project is assessed through Project quality assessment by the Review committee

External Assessment:

External assessment is carried out by an External senior faculty appointed by the Board of Studies of the University. Grades, Excellent, Very Good, Good and Satisfactory are awarded to the student's Project.



Sample of mapping projects to POs/PSOs:

S.No	Project Batch No	Name of Guide	Student Roll Nos	Project Title	POs/PSOs Mapped
1	1A	Dr.B.L.P.Swami	160715732312 160715732308	Mechanical Properties of Mixed Fiber Reinforced Concrete using Steel and Glass Fibers	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
2	2A	Mrs.C.Chandana Priya	160715732040 160715732314 160715732006	Experimental stuudy on mechanical properties of fly ash concrete with Quartz sand as replacement to fine aggregate.	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
3	3A	Dr.B.L.P.Swamy	160715732311 160715732017	Strength prediction of flyash concrete by accelerated curing method & correlation with normal curing strength.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
4	4A	R.Srikanth	160715732049 160715732022 160715732044 160715732025	Experimental studies on partial replacement of bituminous material with Recycled plastics.	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO3
5	5A	Shaista Begum	160715732032 160715732313 160715732020 160715732016	Mechanical properties of Terinary blended concrete.	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
6	6A	Dr.B.L.P.Swami	160715732304 160715732046 160715732021	Mechanical properties of Mixed fiber Reinforced concrete using steel and polyproplyene fibers.	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
7	7A	M.sambasiva Rao	160715732025 160715732057 160715732048	Design of Rain water harvesting pit in our college campus.	PO1,PO2,PO3,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
8	8A	V.Venkata Vijaya Kumar	160715732307 160715732002 160714732087	Designing And Estimation of Residential Apartment- Green Building Materials.	PO1,PO2,PO3,PO5,PO6,PO7,PO8,PO9,PO10,PO11,PO12,PSO2
9	9A	Dr.K.Santhosh kumar	160715732305 160715732310 160714732024	Evaluation of ground water prospects and mapping-A case study from hyderabad	PO1,PO2,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2,PSO3
10	11A	C.Chandana priya	160715732306 160715732302 160714732011	Strength Appraisal of High-volume flyash concrete.	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
11	12A	Dr.K.santhosh kumar	160715732309 160715732037 160714732058	Assessment of surface water quality - A case study of Makka Vagu.	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO3
12	14A	Dr.Akshay S.K. Naidu	160715732050 160715732010	Design and Analysis of an Apartment and a Villa in a colony.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
13	17A	A.S.Prasad	160715732303 160715732013	Analysis and Design of an industrial Building.	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
14	18A	Dr.Akshay S.K.Naidu	160715732005 160715732041 160715732009 160714732001	Study of the mechanical properties of high strength geopolymer concrete(M60)	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
15	19A	Dr.B.L.P.Swamy	160714732047 160714732032 160714732016	Design and analysis of multistoried building using ETABS	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
16	20A	A.S.Prasad	160714732035 160714732007 160714732041	Analysis and Design of Hospital Building using ETABS	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO11,PO12,PSO2
17	21A	A.S.Prasad	160714732048 160714732051 160714732083	Analysis and Design of Multistoried Residential Building Using ETABS	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO11,PO12,PSO2
18	1B	Sri.M. Sambasiva Rao	160715732088 160715732320 160715732091	Rain Water Harvesting In The campus Of Our College(A Live Project)	PO1,PO2,PO3,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
19	2B	Smt. Shaista Begum	160715732086 160715732325 160715732100 160715732085	Earthquake resistant analysis and design of multi-storied Structures with and with-out Shear walls	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
20	3B	Sri.M. Sambasiva Rao	160715732315 160715732319 160715732109	study on strength of clay soils by blending with glass fibre and polypropylene fibre	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
21	5B	Prof. A.S Prasad	160715732326 160715732104 160715732062 160715732108	Experimental study on M30 Grade Fiber Reinforced Concrete using steel fibres	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
22	6B	Dr. B.L.P Swamy	160715732105 160715732323 160715732072 160715732328	Experimental study on flyash and GGBS based geopolymer concrete with various other mineral admixtures	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1

23	9B	Sri.M. Sambasiva Rao	160715732074 160715732317 160715732083	Analysis and design of super passage	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
24	10B	Dr. Akshay S.K. Naidu	160715732321 160715732110 160715732080	Design and analysis of residential building using staad-pro	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
25	11B	Smt. Shaista Begum	160715732316 160715732327 160715732065	Experimental study on Mechanical Properties of M40 Grade Concrete using Blast Furnace slag as aggregate	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
26	14B	Mr Shaik Mohammad Imran	160715732067 160715732103 160715732095 160715732099	Study on Mechanical properties of Concrete using Manufactured Sand as Fine Aggregate	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
27	16B	Dr. Akshay S.K. Naidu	160715732322 160715732324 160715732075	Retrofiting of an Existing Structure	PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO12,PSO2
28	20B	Dr. Akshay S.K. Naidu	160715732318 160715732073 160715732112	Design of Public Utility Building With Energy Conservation Methods	PO1,PO2,PO3,PO5,PO6,PO7,PO8,PO9,PO10,PO11,PO12,PSO2
29	21B	Smt. Shaista Begum	160715732097 160714732066 160714732060	Experimental Study on mechanical properties of binary blended recycled aggregate concrete using GGBS	PO1,PO2,PO3,PO4,PO6,PO7,PO8,PO9,PO10,PO12,PSO1
30	22B	Dr. K Santosh Kumar	160714732082 160714732090 160713732013	Ground Water Pollution for environmental assessment in jeedimetla area- GHMC	PO1,PO2,PO4,PO6,PO7,PO8,PO9,PO10,PO12, PSO3

A Sample Course Attainment process for a batch:

METHODIST
COLLEGE OF ENGINEERING AND TECHNOLOGY
Approved by AICTE New Delhi | Affiliated to Osmania University, Hyderabad
Estd : 2008 Address : King Koti Road, Abids, Hyderabad, Telangana, 500001 | Email : principal@methodist.edu.in

DEPARTMENT OF CIVIL ENGINEERING

PROJECT ATTAINMENT

AY: **Name of the Guide:** Sri.M. Sambasiva Rao

NAME OF PROJECT : Rain Water Harvesting In The campus Of Our College(A Live Project)

Batch Number 001B

S.No.	Roll No. ↓	Review 1	Review 2	Day to day evalauation	University Examination
	Max. Marks →	20	20	10	(E/VG/G/S/US)
1	160715732088	18	19	10	EX
2	160715732320	16	17	8	VGD
3	160715732091	17	17	9	EX
4					
	Average Mark	17	17.67	9.00	
	% Marks	85%	88%	90%	85%
	*Attainment**	*3*	*3*	*3*	*3*
	Mapping:				
	CO 1	√		√	√
	CO 2	√		√	√
	CO 3		√	√	√
	CO 4		√	√	√
	CO 5	√	√	√	√
	CO 6	√	√	√	√

Attainment:					Overall
CO 1	3		3	3	3.00
CO 2		3	3	3	3.00
CO 3			3	3	3.00
CO 4	3	3	3	3	3.00
CO 5	3	3	3	3	3.00
CO 6			3	3	3.00
				Attainment based on Academic Performance	**3.00**

	Attainment
Academic performance (60% Weightage)	3.00
Project Outcomes(Prizes/Utility projects/Publications/Best project) (40%)	2
Overall	2.60

*** Attainment Rubrics:**

Academic Peformance	Attainment
<=70%	1
70-80%	2
>=80%	3

Project Outcomes	Status	Count
Prizes	No	0
Live or Utility Projects	Yes	1
Publications	No	0
Best project by examiner	Yes	1

Guide Signature

7.6. Direct Assessment of Seminars:

Direct Assessment process for seminars course involves only Continuous Internal Evaluation (CIE).

The scheme of evaluation and grading for each course is as shown below:

S. No	Component	Duration	Maximum Marks
	Continuous Internal Evaluation (CIE)		
1.	Internal Examination – I	1 hours	25
	CIE (Total)		**25**
		TOTAL	**25**

Attainment of Course Outcomes (CO):

- Six COs are written for seminar course in which, the action verbs corresponding to the Bloom's taxonomy level for cognitive learning is identified and highlighted.
- Seminar courses consist of only continuous internal evaluation (CIE) process which constitutes for 25 marks.

The overall CO percentage score is computed by taking the values of continuous internal evaluation (CIE) only. This score is finally converted to CO attainment rubric based on the following table.

CO Percentage score	CO attainment rubric
%CO ≥ 60	3
50 ≤ %CO < 60	2
%CO < 50	1

7.7. Indirect Assessment of Seminar Courses:

In indirect assessment method, CO based feedback is collected from the students at the end of the semester, wherein students rate all COs of the course in a scale of 3.

Level of CO	Student Rating
Excellent	3
Satisfactory	2
Poor	1

Sample project seminar Attainment sheet:

Methodist College of Engineering and Technology
Department of Civil Engineering

Course Attainment

Academic Year

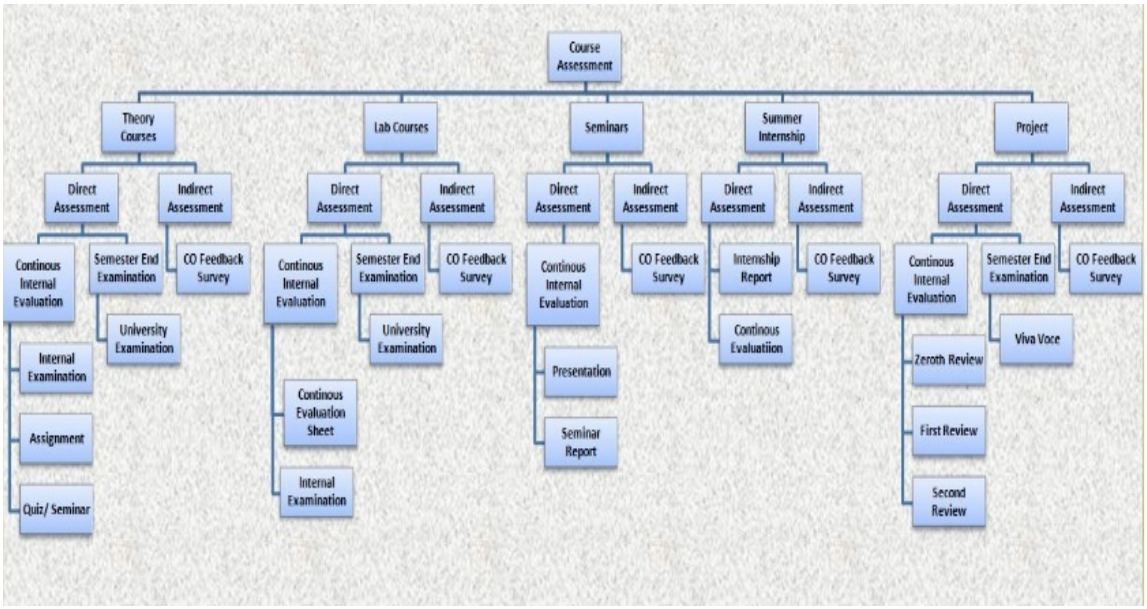
Course Name with Code	Project seminar; CE433
Class	IV year - I Sem Non-CBCS
Faculty Name	M.Sambasiva Rao

CO Attainment	CIE	Overall (Rubric) Direct	CO Indirect	Final CO attainment
CO 1	100	3	2.60	2.92
CO 2	100	3	2.60	2.92
CO 3	100	3	2.60	2.92
CO 4	100	3	2.30	2.86
CO 5	100	3	2.00	2.80
CO 6	100	3	2.30	2.86
Overall Course Attainment				2.88
Set Target for the course				**2.71**
Course Attainment Status(Yes/No)				**Yes**

CO Percentage score	CO attainment rubric
%CO ≥ 60	3
50 ≤ %CO < 60	2
%CO < 50	1

Finally, for each course, based on the feedback obtained from the students, averages are calculated for each CO and overall course attainment is computed.

Similarly, for every course of B.E. level program, attainments are calculated using Direct Assessment Method and Indirect Assessment Method as shown in the below flow chart:



7.8 Assessment of the Attainment of Course Outcomes:

The assessments of the COs attainments is done as follows:

1) The COs attainments are evaluated by a departmental academic committee lead by the Head of the department and consisting of two senior faculty. The committee reviews the attainment levels and puts forth suggestions of measures to improve the performance of the students. This assessment is done twice a year, after the semester results are released by the University.

Sample of Attainment of Course Outcome of all courses with respect to set attainment levels

Course Code	Course Name	Direct Attainment	Indirect Attainment	Overall Attainment	Course Target Set	Attainment Status
BS301MT	Engineering Mathematics - III	2.17	2.87	2.31	2.08	YES
ES321EE	Electrical Technology	3.00	2.13	2.83	1.71	YES
ES321ME	Mechanical Technology	3.00	2.48	2.90	1.79	YES
PC301CE	Engineering Geology	2.33	2.55	2.37	2.23	YES
PC302CE	Strength of Materials - I	1.75	2.50	1.90	1.73	YES
PC303CE	Fluid Mechanics - I	1.83	2.50	1.96	2.72	NO
PC304CE	Building Materials and Construction	3.00	2.80	2.96	2.02	YES
PC305CE	Surveying - I	2.67	3.00	2.74	1.88	YES
PC351CE	Engineering Geology Lab	3.00	2.62	2.92	2.26	YES
PC352CE	Surveying - I Lab	3.00	3.00	3.00	2.31	YES

Sample of Course Direct Attainment Table

Course Code	CO1	CO2	CO3	CO4	CO5	CO6	Average
BS301MT	2	2	3	1	2	3	2.17
ES321EE	3	3	3	3	3	3	3.00
ES321ME	3	3	3	3			3.00
PC301CE	2	2	2	3	2	3	2.33
PC302CE	2	2	2	2	2	1	1.75
PC303CE	2	2	2	2	2	1	1.83
PC304CE	3	3	3	3	3	3	3.00
PC305CE	2	3	3	3	2	3	2.67
PC351CE	3	3	3	3	3	3	3.00
PC352CE	3	3	3	3	3	3	3.00

Sample of Course Indirect Attainment Table

Course	CO1	CO2	CO3	CO4	CO5	CO6	Average
BS301MT	2.60	3.00	2.60	3.00	3.00	3.00	2.87
ES321EE	2.60	2.30	2.30	2.00	1.60	2.00	2.13
ES321ME	2.3	2.3	2.3	3			2.48
PC301CE	2.60	2.60	2.60	2.60	2.60	2.30	2.55
PC302CE	2.60	2.60	2.60	2.30	2.30	2.60	2.50
PC303CE	2.60	2.30	2.60	2.60	2.30	2.60	2.50
PC304CE	3.00	3.00	2.60	3.00	2.60	2.60	2.80
PC305CE	3.00	3.00	3.00	3.00	3.00	3.00	3.00
PC351CE	2.30	2.60	2.60	3.00	2.60	2.60	2.62
PC352CE	3.00	3.00	3.00	3.00	3.00	3.00	3.00

METHODIST COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOME STUDENT FEEDBACK FORM

A.Y: 2018-19 B.E IV SEMESTER

Name: Bindu ka **Roll No:** 160117732072

Scale of Rating : 3 - Excellent, 2.- Good, 1 - Poor

S.no	Course Code	Course Title		Course Outcome	Your Rating
1	BS423MT	Numerical Methods	CO1	**Find** solutions of algebraic and transcendental equations by using different methods.	2
			CO2	**Evaluate** the eigenvalues of a matrix numerically	3
			CO3	**Evaluate** double integrals using different methods	3
			CO4	**Develop** an approximate interpolating polynomials for equal and unequal intervals.	3
			CO5	**Extending** the concepts of numerical differentiation and integration to calculate velocity, acceleration,area of the region	2
			CO6	**Discuss** ordinary and partial differential equations using numerical methods	3
2	PC401CE	Strength of Materials II	CO1	**Estimate** the Slope and deflection of beams subjected to different loading by adopting various methods.	3
			CO2	**Apply** the key concepts, theories and mathematical fundamentals to derive mathematical relations involved in evaluation of slope and deflections in a beam under various load types mentioned above.	1
			CO3	**Determine** the safe and economical section of a circular shaft.	1
			CO4	**Evaluate** the deflection & stiffness of springs.	2
			CO5	**Make use of** strain energy principles for beams and calculate the strain energy stored using various theorems and also analysis of continuous beams.	1
			CO6	**Formulate** of equivalent length for long columns using Rankine's theory & safe load coming on the columns	2
3	PC402CE	Fluid Mechanics - II	CO1	**Define** Reynolds number and classify the types of flows based on Reynolds number	3
			CO2	**Explain** the pressure drop in a given length of pipe due to friction in a pipe and compare Heigen poseuille with Darcys equation and also solve problems of flow through pipes in parallel and series	3
			CO3	**Define** critical period in case of water hammer phenomenon and compare gradual valve closure with sudden valve closure	2
			CO4	**Explain** Boundary layer types with their different thicknesses and give reason for boundary layer seperation and apply the concept to calculate drag and lift forces on sphere, cylinder,flat plate etc.,	3
			CO5	**Compare** pipe flow and channel flow and define most efficient channel section and construct velocity profiles and pressure profile diagrams	3
			CO6	**Classify** gradually varied flow profiles with different methods and explain differnce between hydraulic jump and surge and also classify hydraulic jump based on Freuds number	2
4	PC403CE	Surveying -II	CO1	**Explain** the terminologies and concepts involved in modern surveying equipments and technologies like theodolite, total station, remote sensing, GIS,GPS etc and also defines the concepts of horizontal and vertical curves.	3
			CO2	**Demonstrate** the parts, working principles and applications of theodolite, EDM and total station instruments.	3
			CO3	**Apply** the knowledge of basic surveying in finding out Horizontal and vertical angles, traversing methods using theodolite instrument	3
			CO4	**Apply** the knowledge of theodolite and basic trigonometry in finding heights of inaccessible points	3
			CO5	**Make use of** knowledge of curves concept in surveying, in setting out both horizontal and vertical curves for the purpose of roadway and railway alignment	3
			CO6	**Analyse** the amount of closing error of a traverse after finding out the omitted measurements in traverse and computes the missing data	3
5	PC404CE	Hydrology and Water Management	CO1	**Estimate** the rainfall over a catchment area.	3
			CO2	**Evaluate** the evaporation, infiltration and runoff hydrograph.	2
			CO3	**Assess** different aquifer parameters influencing the groundwater occurrence	2
			CO4	**Apply** statistical methods in the field of hydrological analysis	1
			CO5	**Compare** and evaluate a number of methods for determining peak flows and flood hydrographs	1
			CO6	**Estimate** the ground water potential based on theoretical principles	1
6	MC916CE	Environmental Sciences	CO1	**Adapt** Environmental ethics and verbally discuss environmental issues to attain sustainable development.	3
			CO2	**List out** common and adverse human impacts on biotic communities, soil, water, and air quality and suggest sustainable strategies to mitigate these impacts	2
			CO3	**Identify** various levels, values and threats of biodiversity and biogeogrphical classification of India.	3
			CO4	**Elaborate** social and environmental issues to prevent future damage of the environment.	3
			CO5	**Explain** the importance of Environmental legislation policies.	2
			CO6	Categorize the types of environmental pollution and the various treatment technologies for the diminution of environmental pollutants and contaminants.	3

METHODIST COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOME STUDENT FEEDBACK FORM

A.Y: 2018-19 B.E IV SEMESTER

Name: Bindu Ka **Roll No:** 160717 70 004 2

Scale of Rating : 3 - Excellent, 2.- Good, 1 - Poor

S.no	Course Code	Course Title		Course Outcome	Your Rating
7	HS401BM	Managerial Economics and Accountancy	CO1	**Illustrate** the responsibility of a manager and fundamental concepts of Managerial Economics.	3
			CO2	**Illustrate** demand analysis and determinants of demand.	3
			CO3	Analyse production & markets and compute the future sales level.	3
			CO4	**Illustrate** the features, merits, uses & limitations of Pay back , ARR,NPV, PI & IRR methods of capital budgeting.	2
			CO5	**Illustrate** the Principles of accounting and prepare Journal, Ledger, Trial balance, manufacturing	3
			CO6	Forcast and compute the Break Even Points /profits /Profit Volume Ratios of the Enterprise	2
8	PC451CE	Material Testing Lab	CO1	**Appraise** behaviour of a ductile material under direct tension test, in addition to gaining knowledge on elastic properties of the material	2
			CO2	**Identify** the importance of hardness of various metals like steel, brass, copper, aluminum etc. and would be able to compare the relative hardness of various engineering metals.	2
			CO3	**Perceive** and formulate the compressive strength of different engineering materials so as o apply this knowledge in the safe design of buildings and structures.	2
			CO4	**Assess** and understand the flexural properties of beams (simply supported, cantilever and fixed) made of different materials like wood, steel, copper etc. and this knowledge would help him in the design of engineering structures.	2
			CO5	**Interpret** the application of tension and compression springs in practice and will understand the properties like stiffness, capacity, shear modulus etc. of the springs.	2
			CO6	**Illustrate** the impact properties of the materials like steel or concrete will help the student to compare the impact resistance capacity, energy absorption etc. of the material which is been put to use in structures which may undergo impact sometimes.	2
9	PC452CE	Fluid Mechanics- I Lab	CO1	**Examine** the variation of coefficient of discharge of Venturimeter and orifice meter	3
			CO2	**Compare** Coefficient of discharge of mouth piece with circular orifice	3
			CO3	**Compare** Coefficient of discharge of Rectangular notch with Triangular notch	3
			CO4	**Classify** different types of flows using reynolds apparatus	3
			CO5	**Compare** various losses in pipes and pipe fittings	2
			CO6	**Show** that coefficient of discharge is more than unity in Broad crested weir	2
10	PC453CE	Surveying- II Lab	CO1	**Demonstrate** the working principles and handling procedures of theodolite	3
			CO2	**Construct** the traverse using theodolite and balance using bowditch's method	3
			CO3	**Make use of** theodolite in finding out horizontal and vertical angles and also in setting out horizontal curves	3
			CO4	**Apply** the knowledge of trigonometrical levelling in finding out reduced levels of elevated objects which are both accessible and inaccessible	3
			CO5	**Demonstrate** the principles and uses of total station	3
			CO6	**Make use of** total station to determine elevation differences, reduced levels and areas of traverse	3

Signature

7.9. Attainment of the Program Outcomes (POs) & the Program Specific Outcomes (PSOs):

Firstly, Program Outcomes (PO) and Program Specific Outcomes (PSOs) are defined for the Bachelor of Engineering Program by the Head of the Department.

Six COs are written for each course in which, the action verbs corresponding to the Bloom's taxonomy level for cognitive learning is identified and highlighted. For each course, the course outcomes are mapped with the POs and the PSOs and presented in a CO-PO mapping table. The mapping table gives the strength of the mapping of a CO with a specific PO/PSO in the scale 1-3.

Correlation Factor	Status
3	Highly Correlated
2	Moderately Correlated
1	Slightly Correlated

The college follows a unique and in-house developed scheme in determining the CO-PO mapping matrix, based on differential taxonomy levels of the COs and the POs& PSOs.

7.9.1. Direct Method:

In order to compute PO and PSO attainments, CO attainment for every course for a batch is computed using the results of Continuous Internal Evaluation (CIE) and Semester End Examinations (SEE). These CO-attainments are considered as direct CO attainments. Afterwards, Indirect CO-attainments will be calculated based on CO feedback form from the students at the end of semester.

In this indirect co-attainment , at the end of the course, CO based feedback forms are distributed to students to give their rating on the course, on a scale of 1-3.

Scale	Status
3	Excellent
2	Satisfactory
1	Needs improvements

After analysing the feedback forms, Assessment Committee gives the CO Attainment obtained using these forms to the respective faculty

Then PO and PSO attainments are calculated for a course from the weighted average of the CO attainments of that course (i.e 80% of direct CO attainment value + 20% of indirect CO attainment value) to overall CO attainment of that course . The formula used to calculate PO and PSO Attainment is given below:

PO Attainment= {Over all CO Attained*(corresponding PO from CO-PO Mapping table)}/ 3

PSO Attainment={Over all CO Attained*(corresponding PSO from CO-PSO Mapping table)}/ 3

The PO/PSO attainments are averaged over all the courses of a batch to get the final attainments of the POs/PSOs using direct method.

Methodist College of Engineering and Technology
Department of Civil Engineering

Program Outcomes Attainment

Academic Year

Course Name with Code	**PC302CE: STRENGTH OF MATERIALS – I**
Class	**B.E III Semester**
Faculty Name	**Dr. Akshay S. K. Naidu**

CO-PO Mapping table:

PO / CO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C302.1	3	1			1			1	1	1					
C302.2	3	2			1			1	1	1				2	
C302.3	3	2			1			1	1	1				2	
C302.4	3	3	1	1	1			1	1	1				2	
C302.5	3	3	2	2	1			1	1	1				2	
C302.6	3	3	3	3	1			1	1	1				3	
C302	**3.00**	**2.33**	**2.00**	**2.00**	**1.00**			**1.00**	**1.00**	**1.00**				**2.20**	

POs Attainment through course:

PO / CO	CO Attained	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C302.1	2.12	2.1	0.7			0.7			0.7	0.7	0.7					
C302.2	2.12	2.1	1.4			0.7			0.7	0.7	0.7				1.4	
C302.3	2.12	2.1	1.4			0.7			0.7	0.7	0.7				1.4	
C302.4	2.06	2.1	2.1	0.7	0.7	0.7			0.7	0.7	0.7				1.4	
C302.5	2.06	1.7	1.7	1.1	1.1	0.6			0.6	0.6	0.6				1.1	
C302.6	1.32	1.3	1.3	1.3	1.3	0.4			0.4	0.4	0.4				1.3	
C302	**1.97**	**1.9**	**1.4**	**1**	**1**	**0.6**			**0.6**	**0.6**	**0.6**				**1.3**	

Faculty Signature

7.9.2. Indirect Method:

In this method, feedback forms from various categories of people are collected and assessment is done as follows:

1) Alumni Feedback form
2) Parent feedback form
3) Student exit feedback form
4) Employer feedback form

1. Alumni Feedback form:

In this method, alumni feedback forms are distributed to students to give their rating on different parameters on a scale of 1-3during the Alumni meet conducted by the institution.

The various parameters of the Alumni feedback forms are mapped to Programme Outcomes and Programme Specific Outcomes using the following table:

S.No	Parameters	Relevance to PO & PSO
1	Effectiveness of teaching processes	PO2, PO3, PO4, PO5
2	Learning environment	PO8, PO9, PO10, PO12, PSO1,PSO2.PSO3
3	Faculties Helpfulness	PO2, PO3, PO4, PO5, PO11,PSO1,PSO2,PSO3
4	Course Structure	PO1-PO12, PSO1,PSO2,PSO3
5	Computing and Internet facilities	PO4, PO5, PO12 PSO1,PSO2
6	Quality of Electives	PO1, PO5, PSO2,PSO3
7	Relevance of labs with courses	PO2, PO3, PO4, PO5,PO11, PSO1,PSO2
8	Sensitization towards social issues courses	PO6, PO7, PO8, PSO3
9	Personality/Communication skills development facilities	PO8, PO9, PO10
10	Emphasis on extra learning or self-learning	PO4, PO12, PSO2, PSO3

After analysing the feedback forms, Assessment Committee members will calculate the PO Attainments based on the above table.

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DEPT. of CE/CSE/EEE/ECE/ME/MBA

ALUMNI FEEDBACK

Name & Roll No:	Year of leaving:
Branch Studied:	Present status:

Please provide your valuable feedback to improve quality of the programme. Select your ranking on the scale of 1 to 3 for each of the following parameters
3- Excellent 2- Good, 1- Satisfactory

Sl. No.	Parameters	1	2	3
1.	Effectiveness of Teaching Processes			
2.	Learning environment			
3.	Faculty helpfulness			
4.	Course structure			
5.	Computing and Internet Facilities			
6.	Quality of Electives			
7.	Relevance of labs with courses			
8.	Sensitization towards social issues courses			
9.	Personality/ Communications Skills Development Facilities			
10.	Emphasis on extra learning or self learning			

2. Parent feedback form

In this method, parent feedback forms are distributed to the parents to give their rating on different parameters on a scale of 1-3 during their visit on parent-teacher interaction conducted by the department.

The various parameters of the Parent feedback forms are mapped to Programme Outcomes and Programme Specific Outcomes using the following table.

S.No	Parameters	Relevance to PO & PSO
1	Student performance	PO1, PO2, PO5, PO9,PO10,PSO1,PSO2,PSO3
2	Library facilities	PO5
3	Course content	PO1- PO5, PO9- PO12 PSO1,PSO2,PSO3
4	Student's comfort in coping with workload	PO2, PO9, PO12, PSO2
5	Student participation in college activities	PO6, PO9, PO10
6	Student's awareness towards social issues like gender equality, environment, ethics and values through courses	PO6, PO7, PO8 ,PSO3
7	Academic flexibility through elective courses	PO1,PO5, PSO2, PSO3
8	Parent interaction with faculty	PO6
9	Emphasis on soft skill development	PO5, PO9, PO10, PSO2
10	Students transformation	PO1- PO12 ,PSO1, PSO2,PSO3

After analysing the feedback forms, Assessment Committee members will calculate the PO Attainments based on the above table.

METHODIST COLLEGE OF ENGG & TECHNOLOGY

ABIDS, HYDERABAD

DEPT. of CE/CSE/EEE/ECE/ME/MBA

PARENT FEEDBACK

Parent Name:	Student Name & Roll No:
Profession & Address:	Class & Branch:

Please provide your valuable feedback to improve quality of the programme. Select your ranking on the scale of 1 to 3 for each of the following parameters
3- Excellent 2- Good, 1- Satisfactory

Sl. No.	**Parameters**	**1**	**2**	**3**
1	Student performance			
2	Library facilities			
3	Course content			
4	Student's comfort in coping with workload			
5	Student's participation in college activities			
6	Student's awareness towards social issues like gender equality, environment, ethics and values through courses			
7	Academic flexibility through elective courses			
8	Parent interaction with faculty			
9	Emphasis on soft skill development			
10	Student transformation			

3. Student exit feedback form:

In this method, feedback forms are distributed to the students to give their rating on different parameters on a scale of 1-3, when they are about to leave the institution.

The various parameters of the Student Exit feedback forms are mapped to Programme Outcomes and Programme Specific Outcomes using the following table:

S.No	Parameters	Relevance to PO & PSO
1	Satisfaction from Technical knowledge	PO1, PO2, PO3, PO4, PO5,PSO1,PSO2,PSO3
2	Employability skills	PO1- PO5, PO8-PO11,PSO1,PSO2,PSO3
3	Laboratory facilities	PO2- PO5, PO11,PSO1,PSO2
4	Extracurricular & Co-curricular activities	PO6- PO12,PSO2,PSO3
5	Overall rating on attainment of intended POs	PO1- PO12,PSO1,PSO2,PSO3

After analysing the feedback forms, Assessment Committee members will calculate the PO Attainments based on the above table.

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Department of Civil Engineering

Program Exit Survey

Name:	Academic Year
Roll No.	Class:

Please provide your valuable feedback to improve quality of the programme. Select your ranking on the scale of 1 to 3 for each of the following parameters
3- Excellent 2- Good, 1- Satisfactory

S. No.	Parameters	1	2	3
1	Satisfaction from Technical Knowledge			
2	Employability skills			
3	Laboratory facilities			
4	Extracurricular and co-curricular activities			
5	Overall rating on attainment of intended PO's			

Student Signature

4. Employer feedback form

In this method, feedback is taken from the employer of our student on different parameters on a scale of 1-3.

The various parameters of the Employer feedback forms are mapped to Programme Outcomes and Programme Specific Outcomes using the following table:

S.No	Parameters	Relevance to PO & PSO
1	Performance of the employee	PO1, PO2, PO3, PO4, PO5,PO8, PO9, PO10,PO11,PSO1,PSO2,PSO3
2	Technical skills	PO1, PO2, PO3, PO4, PO5 PSO1,PSO2,PSO3
3	Creative and innovative skills	PO4, PO5,PSO2
4	Employee enthusiasm to continuous learning	PO12,PSO1,PSO2,PSO3
5	Passion for growth	PO9,PO12,PSO1,PSO2,PSO3
6	Interpersonal kills	PO8, PO9, PO10,PO11
7	Teamwork	PO9
8	Ethical values and social responsibility	PO6, PO7,PO8,PSO3
9	Attitude towards social issues like gender equality and environment	PO6, PO7,PO8,PSO3
10	Do you recommend our Institution to others	PO1-PO12

After analysing the feedback forms, Assessment Committee members will calculate the PO Attainments based on the above table.

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EMPLOYER FEEDBACK

Name of the Organisation:	Name of the Employee:
Name of the officer:	Year of passing:
Designation of the officer:	Branch studied:

Please provide your valuable feedback to improve quality of the programme. Select your ranking on the scale of 1 to 3 for each of the following parameters
3- Excellent 2- Good, 1- Satisfactory

S. No.	Parameters	1	2	3
1	Performance of the Employee			
2	Technical Skill			
3	Creative and Innovative skills			
4	Employee enthusiasm to continuous learning			
5	Passion for growth			
6	Interpersonal skills			
7	Team work			
8	Ethical values and social responsibility			
9	Attitude towards social issues like gender equality & environment			
10	Do you recommend our Institution to others?			

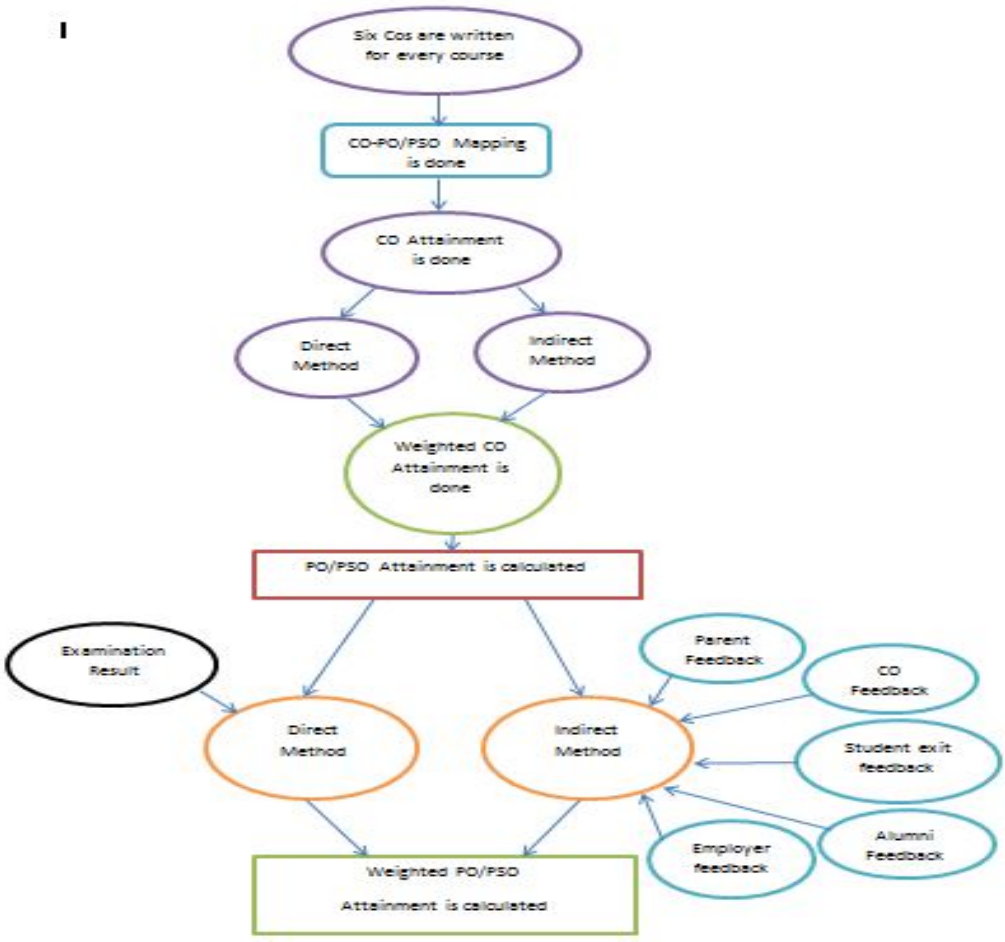
Any suggestions: 1.

2.

Authorised Signatory

Finally, after analysing all the feedback forms, total indirect PO attainment is calculated by taking the average of all the four PO attainments calculated individually.

The following flow chart shows the process involved in calculating PO and PSO Attainments:



Assessment of the Attainment of Program Outcomes & Program Specific Outcomes

The assessments of the COs and POs attainments are done at two levels.

1) The COs attainments and subsequent POs attainments are evaluated by a departmental academic committee lead by the Head of the department and consisting of two senior faculty. The committee reviews the attainment levels and puts forth suggestions of measures to be the performance of the students be improved. This assessment is done twice a year, after the semester results are released by the University.
2) The analysis of the PO attainments is put forth by all the departments to the College Academic Cell. College Academic Cell reviews the assessments of the departmental academic committee, gives suggestions for any modification and gives the final approval.

Sample of PO Attainments:

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
BS301MT	2.3	2.2	2.2	2.2	1.2			0.8	0.8	0.8		
ES321EE	2.8	2.3	1.9	2.1	0.9			0.9	0.9	0.9		
ES321ME	2.9	1.7	2.9		1.0				1.0	1.0		
PC301CE	2.3	1.9		1.7	0.8		2.4					
PC302CE	1.9	1.4	1.0	1.0	0.6			0.6	0.6	0.6		
PC303CE	1.7	1.7			2.1							
PC304CE	3.0	2.3		2.4				1.0	1.8	1.8		
PC305CE	2.7	2.1				2.2		0.9	0.9	0.9		
PC351CE	2.4	2.9		1.6		1.6			1.0	2.9		2.9
PC352CE	2.8	3.0			3.0			1.0	1.0	3.0		

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO Attainment	2.47	2.21	1.88	2.13	1.88	2.09	2.25	1.48	1.54	1.61	2.12	1.89
Direct Attainment	2.52	2.19	1.78	2.08	1.78	2.04	2.24	1.27	1.36	1.44	2.08	1.78
Indirect Attainment	2.29	2.29	2.30	2.31	2.30	2.29	2.31	2.30	2.28	2.28	2.30	2.32

Sample of PSO Attainment

Course Code	PSO1	PSO2	PSO3
BS301MT			
ES321EE			
ES321ME			
PC301CE			
PC302CE		1.33	
PC303CE			
PC304CE	1.64		1.95
PC305CE			
PC351CE			
PC352CE			

Course	PSO1	PSO2	PSO3
CO Attainment	2.20	2.12	1.95
Direct Attainment	2.18	2.08	1.87
Indirect Attainment	2.29	2.28	2.26