Manual for Outcome Based Education

MANAV RACHNA UNIVERSITY, FARIDABAD
PROCESS MANNUAL

Credibility of the evaluation system is highly important to maintain the rigorous regime of teaching learning processes at University. The assessments & evaluation process of the university shall be able to demonstrate to all of its stakeholders, especially students, employers and regulatory bodies, that the program outcomes of its academic programs are comprehensive and all its teaching activities are designed to for the accomplishment of learning experience and outcomes. All the academic programmes shall be outcome based aligning with the University vision and Mission. The curricula designed will be aligned towards the attainment of Program Educational Objectives (PEOs), Program Outcomes (POs) and Program Specific Outcomes (PSOs). Every stated objective and outcome can be assessed and evaluated. Interactive and innovative teaching-learning methodologies shall be integrated to complement traditional methods for supporting the attainment of these program outcomes.

The departments shall focus on Student centric outcome based education by:

- Having Course Outcome Statements clearly stating what student is expected to be able to know, understand and do
- Creating activities around these statements which will help the student to achieve these outcomes
- Clearly setting the Assessment criteria for the attainment of these outcomes

The effective implementation of outcome-based education involves:

- Establishment of Mission statements in line with the vision of the department & Program Educational Objectives
- Mapping of Mission Statements with Program Educational Objectives (PEOs)

- Defining POs with level of Bloom's Taxonomy
- Mapping Program Educational Objectives with POs
- Defining COs (Course Outcomes) with Bloom's Taxonomy for each Course
- Creating articulation matrix of COs with POs mapping
- Preparing session plan for each course stating the COs every session is focused upon and its Blooms level
- Pedagogies for course delivery and its various topics need to be clearly defined for the attainment of outcome
- Designing all Assessment for the course with mapping of Questions with CO's at Bloom's Taxonomy levels.
- Deciding the target threshold for CO attainment and measuring the same through Direct / Indirect assessments.
- Measuring semester-wise students' performance against COs threshold
- Measuring the attainment of each PO through Direct/Indirect assessments
- Analyzing PO attainment and suggest the remedial actions for continuous improvement
- Assessing the attainment of Program Educational Objectives

Each Department is:

a. Responsible for the quality of the education it provides and shall be of the highest standard.

b. Working towards continuous improvement in the quality of the education it offers to students and implement the approved policies and procedures to enable it to fulfill the statutory requirements of the regulatory bodies with reference to quality and academic standards.

c. Maintaining Course Outcomes (COs)-Program Outcomes (POs)/Program Specific Outcomes (PSOs)-Program Educational Objectives (PEOs) assessment and Attainment manual for imparting the Outcome Based Education.

MANAV RACHNA UNIVERSITY, FARIDABAD

FACULTY OF ....

DEPARTMENT OF ......

Outcome Based Education Manual (AY. ....)

1. UNIVERSITY VISION AND MISSION

Vision of the Institution:

To educate students in frontier areas of knowledge enabling them to take up challenges as ethical and responsible global citizens

Mission of the institution:

- To impart outcome based holistic education
- To disseminate education in frontier areas
- To produce globally competitive, ethical and socially responsible human resources
- To produce human resources sensitive to issues of Environment and Sustainable Development
- To develop Environment and Sustainable development as a thrust area of research and development.

The university mission is fully contemplative of the distinguished attributes of the university in terms of need of the society, skills, competitiveness, global graduate attributes and the values. The diversity of courses offered by the university in various domains, the pedagogy and other related activities that can aid to the holistic development of the students and address the different needs of the society helps in the attainment of University vision. The university places high importance on moral and ethical values.

2. DEPARTMENT VISION AND MISSION

Vision of the Department:
Mission of the Department:

3. PROGRAM EDUCATIONAL OBJECTIVES

Keeping in view Interests of all their stakeholders, the Department of ......,.,............. has formulated the Program Educational Objectives (PEO's) that are comprehensive statements describing the career and professional accomplishments that the program is preparing the learner for.

Department's Program Educational Objectives (PEOs) are derived from the Department's Vision & Mission and are consistent with the Mission of the .... department of Manav Rachna University (MRU),

PEO's of .... Program in ....,.. are:
PEO 1:

PEO 2:

PEO 3:

PEO 4:

PEO 5:

4. PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

Department POs & PSOs are listed as below:

PO1

PO2

P3

P4

.

.

POS and so on

PSO1

PSO2

PSO3

5. MAPPING OF PEOs AND DEPARTMENT MISSION STATEMENTS

Department must create the matrix showing mapping of mission statements of the department with PEOs as given below:

PEO Statements	Mission 1	Mission 2	Mission 3	Mission 4	Mission 5
PEO1:	3	-	2	-	-
PEO2:	-	1	-	2	3
PEO3:	1	-			
PEO4:					
PEO5:					

'Affinity (correlation)' level for the PEO-Mission statements mapping is as follow:
--Low (Slight): 1
--Medium (moderate): 2
---High (Substantial): 3

6. MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES TO PROGRAM OUTCOMES / PROGRAM SPECIFIC OUTCOMES

The matrix showing mapping of POs/PSOs of the department with PEOs is as below:

POs \ PEOs	PO 1	PO 2	PO 3	PO4	PO5	PO6	PO7	PO 8	PO 9	PO10	PO11	PO 12	PSO 1	PSO 2	PSO 3
PEO1	3	2						1	2						
PEO 2															
PEO 3															
PEO 4															
PEO 5															

'Affinity' level for the PEO-POs/PSOs mapping is described as follow:

-Low (Slight): 1

-Medium (Moderate): 2

-High (Substantial): 3

7. COURSE OUTCOMES AS PER BLOOM's TAXONOMY AND ITS MAPPING WITH POs/PSOs

Course outcomes are the specific, measurable, concise, meaningful, and achievable statements defined for each course, stating what students will be able to do after the successful completion of a course.

Course outcomes help Faculty to...

- describe to students what is expected of them
- plan appropriate teaching strategies, materials and assessments
- learn from and make changes to curriculum to improve student learning
- assess how the outcomes of a single course align with larger outcomes for an entire program

Learning outcomes help students to...

- anticipate what they will gain from an educational experience
- track their progress and know where they stand
- know in advance how they'll be assessed

The course articulation/mapping matrix describes the mapping of every CO statement with POs & PSOs of the programme and is done by the programme coordinator. The correlation strength (1,2,3) of each is defined with respect to PO/PSO it is mapped with. Followed by this, a program articulation matrix shall be prepared for all the courses in a program.

Course Title:………………………………………….. Course

Code:………………..

Course Outcomes: The Students will be able to:

CHH-508B.1 Analyses………………………

CHH-508B.2 Evaluate……..

CHH-508B.3 Synthesis…….

CHH-508B.4 Develop ……

Course Articulation Matrix

CO Statement (CHH-508B)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CHH-508B.1	3	2	-	1	-	-	-	-	-	2	3	-	2	-
CHH-508B.2	-	3	2	-	-	1	-	-	3	-	-	2	-	2
CHH-508B.3	2	-	3	2	-	-	-	3	-	2	-	1	-	1
CHH-508B.4	1	2	-	3	-	-	2	-	-	1	2	-	3	-

'Affinity' level are as follow:
-Low (Slight): 1

-Medium (Moderate): 2

-High (Substantial): 3

8. CREATION OF PROGRAM ARTICULATION MATRIX

From the course articulation matrix, program articulation matrix is created wherein all the to be delivered in a program are shown to be mapped with POs & PSOs.

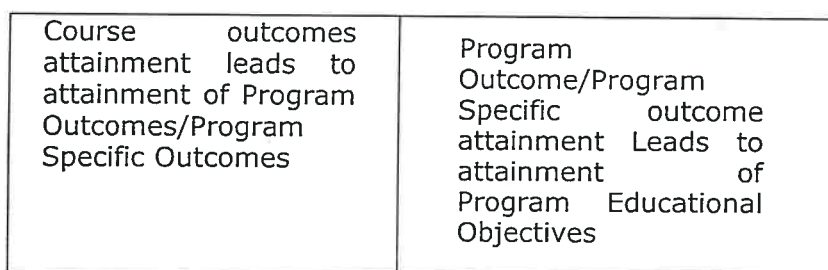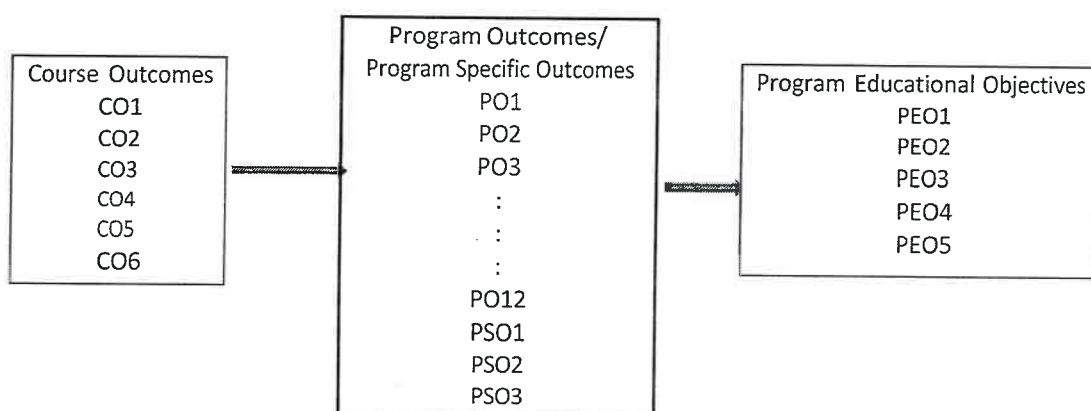| Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CHH-101T	√	√	√	-	√	√	-	-	√	-	√	-	-	√	-
CHH102T															

9. RELATIONSNIP BETWEEN COs-POs/PSOs AND PEOs

The Program outcomes shall be thus computed and assessed at three different levels. Course level, at the completion of each course and its assessment and attainment analysis is done by the course coordinator.

Program Outcome/Program Specific outcome assessment and attainment at the completion of degree Programme and is done by Department academic Committee.

This is followed by the computation of assessment and attainment of Program Educational Objectives (PEOs). This indicates the ability of graduated students to utilize their acquired skill set while performing at different levels during his/her early professional career.

Course Outcomes	Program Outcomes/ Program Specific Outcomes	Program Educational Objectives
CO1 CO2 CO3 CO4 CO5 CO6	PO1 PO2 PO3 : : : PO12 PSO1 PSO2 PSO3	PEO1 PEO2 PEO3 PEO4 PEO5

Course outcomes attainment leads to attainment of Program Outcomes/Program Specific Outcomes	Program Outcome/Program Specific outcome attainment Leads to attainment of Program Educational Objectives

10. COURSE COORDINATOR INVOLVEMENT

Every course coordinators in consultation with all the faculty members delivering the same course would frame measurable, specific and achievable CO statements.

Faculty will carefully complete CO-PO mapping on the basis of all the activities to be conducted and compute CO attainments for subsequent analysis.

Course coordinator would submit CO attainment and subsequent action recommendations to the Program coordinators.

They will consolidate the year wise CO attainment along with recommended actions.

The department academic committee under the guidance of Head of Department would consolidate CO-PO attainment and later PEO attainment, plan overall recommendations for actions and information to Board of studies for their suggestions.
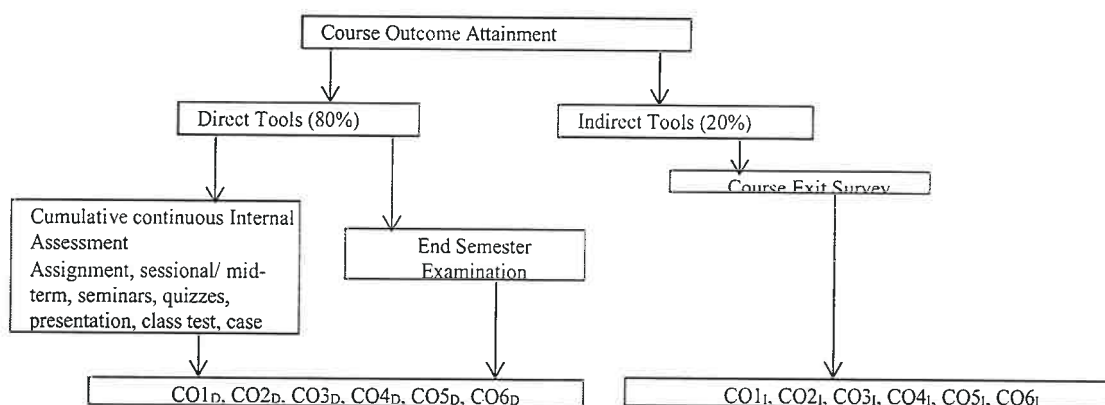
11. COURSE OUTCOME ATTAINMENT PROCESS

11.1 Course Outcome Attainment Assessment Tools:

CO's are attained through Direct & Indirect assessment tools. The weightage for direct and indirect methods fixed will be 80% and 20%, respectively.

Direct tools shall include cumulative continuous internal assessment methods and end semester examinations. Indirect tools will include course exit survey. The process to be followed for course outcome attainment is depicted below:

```
                    Course Outcome Attainment
                    /                      \
          Direct Tools (80%)        Indirect Tools (20%)
           /         \                       |
Cumulative continuous Internal         Course Exit Survey
Assessment                  End Semester        |
Assignment, sessional/ mid- Examination         |
term, seminars, quizzes,                         |
presentation, class test, case                   |
          |              |                        |
  CO1_D, CO2_D, CO3_D, CO4_D, CO5_D, CO6_D   CO1_I, CO2_I, CO3_I, CO4_I, CO5_I, CO6_I
```

Assessment tools for Attainment of Course Outcomes

These different tools for assessment help in evaluating student learning and attainment of course outcomes in best possible manner. Each theory and practical course have internal as well as external assessment covering following parameters:

- Teacher's assessment: This includes assignments, class tests, presentations, tutorials, quiz, case studies, group discussions, group projects, viva voce and lab report for practical courses etc.
- Sessionals /mid term
- End semester examination
- Technical Seminars, internships and Projects

- Industrial Training: Assessment of training primarily includes feedback from the industry mentor, faculty mentor and presentations at different stages to assess the performance.
- Course Coordinators shall prepare the course specific evaluation charts to assess student's performance consistently for COs and subsequent PO attainment analysis.

11.2 Process for CO Attainment:

- For every direct attainment tool mentioned above, each question in all the components of assessment tools mentioned above shall be mapped with course outcome and its Bloom's Taxonomy level
- Question wise marks shall be recorded for all the assessment tools from evaluated answer sheets.
- A database shall be prepared for every course to map marks obtained in each question attempted corresponding to a particular CO.
- For Lab courses/projects/colloquium/industrial internship, experiments etc. Proper rubrics shall be created and shall be mapped to designed course outcomes.
- For the computation of direct attainment, all the questions will be clubbed CO wise, threshold (say of 60%) can be set initially for each CO and the number of students scoring more than threshold in respective questions mapped to a particular CO shall be counted and divided by total number of students to compute the direct CO attainment in that particular question. Similar way, it is to be computed for all the questions mapping to that particular CO followed by the computation of Average CO.
- This will provide the direct attainment of Course outcomes.
- For computation of indirect CO attainment, students shall submit the course exit survey at the end of each course. The weighted average shall be computed to get the indirect CO attainment.
- The weighted sum of direct and indirect attainment (0.8* Direct CO attainment + 0.2*Indirect CO attainment) will provide the overall CO attainment.
- Course coordinators will set the Course outcome attainment target on the basis of average performance levels in that course during previous three

years. a) Compute the average marks scored in each course during the last three years. b) Compute the percentage of students scoring above the calculated average marks. c) Department may add 5% to set the improved target for continuous improvement.

Target setting Parameters	Target %age from previous 3 years results	0.8* Direct + 0.2* Indirect
Set Target Direct		
Set Target Indirect		
Weightage		
Overall Set Target		

≥ Set Target: Attainment is achieved
< Set Target: Attainment is not achieved

Add 5% to consider continuous Improvement

- Overall CO attainment shall be analyzed (attainment is achieved/not achieved) by comparing attained CO with the target set for each course.

Course Outcome	Direct Attainment %age	0.8* Direct Attainment %age	In direct Attainment %age	0.2* In direct Attainment %age	Overall CO Attainment
CO1					
CO2					
CO3					
CO4					
CO5					
CO6					

The overall CO attainment shall be mapped to levels (1, 2, 3) of attainment. A middle level (level 2) can be assigned to a range of set target with+ 5% of CO attainment, if possible. Considering the past results/Course outcome, the lower level (level 1) can be set for %age of CO attainment which is less than set target %age. The higher level (level 3) can be set for % age of CO attainment which is greater than set target % age +5%.

Course Outcome	Direct Attainment %age	0.8* Direct Attainment %age	In direct Attainment %age	0.2* In direct Attainment %age	Overall CO Attainment	Level of Attainment (example)
CO1						3
CO2						2
CO3						1
CO4						2
CO5						3
CO6						2
Average CO Attainment						2.16

- Graphical analysis for the CO attainment can be carried out for further planning of subsequent actions.

Level of CO Attainment
Indirect Attainment
Course Exit Survey

<table>
<tr><td colspan="7">Manav Rachna University (established under Haryana State Private University act 2006) Sector-43, Delhi-Surajkund Road, Faridabad. Course Exit Survey</td></tr>
<tr><td colspan="3">1. Name:</td><td colspan="4">2. Roll No.:</td></tr>
<tr><td colspan="3">3. Program:</td><td colspan="4">4. Batch:</td></tr>
<tr><td colspan="3">5. Semester:</td><td colspan="4">6. CGPA till present semester:</td></tr>
<tr><td colspan="3">7.Course Title:</td><td colspan="4">8. Course Code:</td></tr>
<tr><td colspan="7">9. Name of Course Teacher:</td></tr>
<tr><td colspan="7">Rate your understanding of each course outcome on the scale of 5 to 1
5- completely satisfied, 4 — very satisfied, 3- moderately satisfied, 2- slightly satisfied and 1 -
not at all satisfied</td></tr>
<tr><td rowspan="2">Course Outcome</td><td rowspan="2">Please grade the attainment of following course outcomes</td><td colspan="5">RATING</td></tr>
<tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>CO1</td><td>Rate your understanding to ……. C01 statement</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO2</td><td>Rate your understanding to ……..CO2 statement</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO3</td><td>Rate your understanding to ……C03 statement</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO4</td><td>Rate your understanding to…….CO4 Statement</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO5</td><td>Rate your understanding to …… C05 statement</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>CO6</td><td>Rate your understanding to …… C06 statement</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="7">Suggestions for improvement:

Signatures:

Date:</td></tr>
</table>

Consolidated Course Exit Survey and Analysis

Total no. of students, N:

Course Title & Course Code:

Semester: Even/odd Academic

Year:

Course Outcome	No. of students rated '5'	% age of students	No. of students rated '4'	% age of students	No. of students rated '3'	% age of students	No. of student rated '2'	% age of students	No. of students rated '1'	% age of students	Avg % age
CO1	A5	A5/N	A4	A4/N	A3	A3/N	A2	A2/N	A1	A1/N	
CO2											
CO3											
CO4											
CO5											
CO6											

Weighted average, WA= (5*A5 +4*A4+ 3*A3 +2*A2+1*A)/5

Avg %age- (WA/N) *100

The weighted sum of direct and indirect attainment (0.8*Direct CO attainment +0.2*Indirect CO attainment) will provide the overall CO attainment.

12. PROCESS FOR POs/PSOs ATTAINMENT AND ANALYSIS

12.1   Tools for PO/PSO Attainment:

POs/PSOs attainment is computed through Direct and indirect tools only. The weightage for direct and indirect methods fixed will be 80% and 20%, respectively. Direct tools shall include course outcome attainment levels. Indirect tools will include 50% weightage for the program exit survey conducted at the end of the program and 50% weightage for the alumni feedback. The process to be followed is depicted
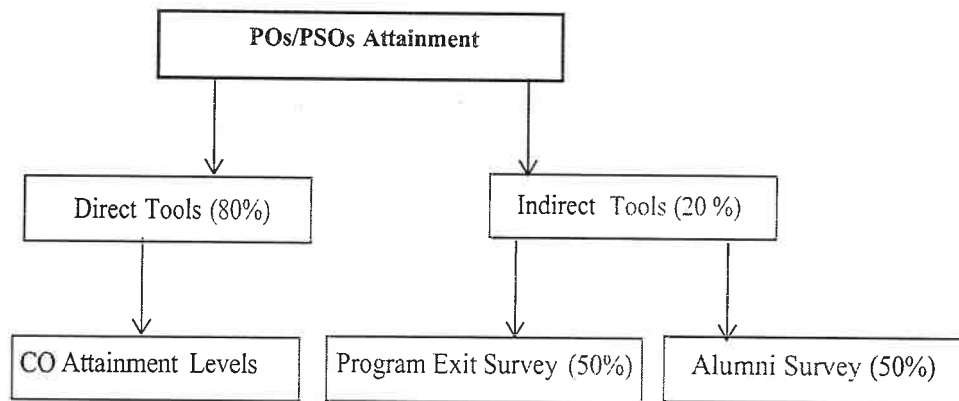
Program exit survey helps in providing the valuable inputs to assess what should be improved, modified or remain intact. The University has Manav Rachna Alumni Association, most of the alumnus are entrepreneur or working at very high positions in the industry. The alumni help the students in training and placement; also invited for interaction with students for the Expert talks on recent practices of the industry and new technologies. Their feedback is also considered for imparting the advice related to the course revision, introduction of new electives, establishment of new labs, conducting workshops & student trainings etc.

12.2 Process of PO/PSO Attainment:

➤ The average attainment of POs (P01, PO2, . .,, PO..) and respective PSOs (PSO1, PSO2, PSO3....) through direct assessment tools shall be calculated using the following steps:

- Affinity factor mentioned in Program articulation matrix for every course outcome will be converted into respective levels as follows:

    Affinity factor '3' shall be mapped to level '1'

    Affinity factor '2'shall be mapped to level '0.66'

    Affinity factor '1' shall be mapped to level '0.33'

- Average Course attainment level of each course shall be recorded

- The course wise attainment of POs (PO1, PO2, ...,) and respective PSOs (PSO1, PSO2, PSO3....) through direct assessment tools shall be calculated using the following formula:

PO_m, or PSO_n attainment of course C_i,

= Course attainment level of COi for Ci

= Correlation level of COi for Ci

Where PO_m: represents POs with m= 1 to total number or POs.

PSOn: represents PSOs with n=1 to 3 or 4 as per number of PSOs designed for Programme.

C_i: represents course 1, 2,3,...,n

CO_i: represents course outcome 1,2,.

12.1.1 The overall attainment level of twelve POs (PO1, PO2, ...) and respective PSOs (PSO1, PSO2, PSO3.....) through direct assessment tools has been calculated using the following formula:

PO_m or PSO_n attainment = $\dfrac{\sum_{i=1}^{n} PO_m \text{ or PSOn attainment of course } C_i}{\text{Number of Courses Mapped with respective } PO_m \text{ or } PSO_n}$

The average attainment of POs (PO1, PO2, ..,.) and respective PSOs (PSO1, PSO2, PSO3.) through indirect assessment tools is calculated using the following steps:

12.1.2 The parameters of Program exit survey and Alumni survey shall be mapped to respective POs/PSOs.

- For the computation of indirect PO/PSO attainment, students shall be asked to fill the Program exit survey after the programme and alumni survey by alumni members, the weighted average shall be computed for all the parameters (Sample forms attached).

- The weighted average of direct (80%) and indirect (20%) PO/PSO attainment shall be computed to know about overall PO/PSO attainment.

MANAV RACHNA UNIVERSITY
Programme Exit Feedback

Section A:
General Information:

Name of Student:_____ Roll No.-_____

Department & Faculty:_____Year of Graduation: _____

Programme _____

Please mention your current status:
a.   Placed from Campus

_____

b.   Details of the Company & Package, if placed_____

c.   Going for higher studies

_____

d.   Programme enrolled for & University, if going for higher studies:

_____

e. Planning your own startup/ Joining Family Business: _____

f. Details, if answer to above is yes:_____

g.   Others (Specify)_____

Email ID:_____   Mobile No.: _____

Section B
Evaluation of Programme Effectiveness:

Please identify the degree to which you believe your undergraduate education helped you to develop the skills and abilities in the following areas to be successful in your professional life:

Sr. No.	Parameters	Strongly Disagree 1	2	3	4	Strongly Agree 5
1	Understanding the importance of interdisciplinary subjects and its application in learning other engineering subjects (PO1)					
2.	Comprehension of the basic knowledge of analysis and design (PO2)					
3	Ability to apply research-based approach using innovative tools and techniques in various fields (PO3)					
4	Ability to apply the knowledge and understanding of the engineering and management principles while working individually and as part of team handling multidisciplinary projects. (PO4)					

5	Ability to communicate effectively in both verbal and written form and develop intrapersonal and interpersonal skills					
6	Ability to develop competencies through self-education for lifelong learning					
7	Ability to secure employment or be an entrepreneur with the application of professional knowledge with ethical responsibility					
8	PSO1					
9	PSO2					
10						
11						

Section C
Additional Information:

1. Do you feel your programme prepared you for your initial job and/ or higher studies?

   Yes ☐   No ☐   Somewhat ☐

2. Are there any other skills or knowledge you would like to have in the programme being offered to current students to ensure their preparedness for employment and/ or higher studies? If YES, please specify

   _____

   _____

3. During the programme, how many courses or training programs have you taken outside the degree programme?

   None ☐   1 - 3 ☐   4 – 6 ☐   More than 6 ☐

4. During the programme, how many conferences, workshops, professional meetings, etc. have you attended?

   None ☐   1 - 3 ☐   4 – 6 ☐   More than 6 ☐

5. During the programme, how many sports and cultural activities have you participated?

   None ☐   1 - 3 ☐   4 – 6 ☐   More than 6 ☐

6. Specify details regarding your achievements in curricular/ non – curricular activities:

   _____

   _____

   _____

Section C
Additional Information:

Rating Scale: (Low-1 High-4)1 – Not up to the mark, 2 – Moderate, 3 – Good, 4 – Very Good, 5-Excellent

1. Head of the Department ☐
2. Teaching Faculty/ Staff ☐
3. Infrastructure ☐
4. Library ☐
5. Laboratories ☐
6. Exam Cell ☐
7. Administration ☐
8. Training & Placement Office ☐
9. Career Development Centre (CDC) ☐
10. Corporate Resource Centre (CRC) ☐
11. Discipline ☐
12. Environment ☐
13. Canteen ☐
14. Sports Facilities ☐

B. Your suggestion (s) for improvement

_____

_____

_____

Signature of Student (Optional)

Date:

Consolidated Program exit Survey

Total no. of respondents, N:
Programme:
Academic Year:

Parameter	No. of students rated '5'	%age of students	No. of students rated '4'	%age of students	No. of students rated '3'	%age of students	No. of students rated '2'	%age of students	No. of student rate4 '1'	%age of students	Weighted Avg %age
Understanding the importance of interdisciplinary subjects and its application in learning other engineering subjects	A5	A5/N	A4	A4/N	A3	A3/N	A2	A2/N	A1	A1/N	
Comprehension of the basic knowledge of analysis and design											
Ability to apply research-based approach using innovative tools and techniques in various fields											
Ability to apply the knowledge and understanding of the engineering and management principles while working individually and as part of team handling multidisciplinary projects.											

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Parameter	No. of students rated '5'	%age of students	No. of students rated '4'	%age of students	No. of students rated '3'	%age of students	No. of students rated '2'	%age of students	No. of student rate4 '1'	%age of students	Weighted Avg %age
Ability to communicate effectively in both verbal and written form and develop intrapersonal and interpersonal skills											
Ability to develop competencies through self-education for lifelong learning											
Ability to secure employment or be an entrepreneur with the application of professional knowledge with ethical responsibility											
PO8											
PO9											
PO10											
PO11											
PO12											
PSO1											
PSO2											
PSO3											

Weighted average, WA(Proq exit) = $(5*A5 + 4*A4 + 3*A3 + 2*A2 + 1*A)/5$

Avg %age= [WA (Prog exit)/N]*100

Manav Rachna University, Faridabad

Alumni Feedback

1. Name & Address

2. Programme studied at MRU_____Year of Passing_____

3. Status after passing out from MRU

    i) What was your primary activity?(Please put a tick ☑ mark in the appropriate box)

    a. Employed for salary   □   b. Seeking employment   □

    c. Undergoing higher studies   □   d. Self employment   □

4. a.Details of your present primary activity Organization at present you are employed:

    Position: Business email id:

    Since when:

    Additional degree undergoing / obtained:
    Year:
    Institution:

5. How satisfied are you with the primary activity? ☑
    a. Extremely satisfied   □   b. Very satisfied   □
    c. Somewhat satisfied   □   d. Not at all satisfied   □

6. Using the following scale, rate the helpfulness of following items in acquiring the skills and knowledge needed to perform your present job (Please put a □ mark).

Description	Extremely helpful (5)	Very helpful (4)	Moderately helpful (3)	Not at all helpful (2)
Courses in major field				
Elective courses				
Project/ research				
Extra-curricular activities				
Formal training in a present job				

Any changes would you like to suggest to improve the curriculum / course?

....

....

....

2. For each of the items below, rate your undergraduate major program (Please put a ✓ mark).

Description	Extremely satisfied (5)	Very satisfied (4)	Moderately satisfied (3)	Not at all satisfied (2)
Relevance of the curriculum to job & Future aspirations				
Inspiration and encouragement				
Interaction with faculty				
Quality of instruction				

3. For each programme educational objective mentioned below, circle a number on the scale provided to rate your satisfaction with the academic preparation you received in that area as a student (Please put a ✓ mark).

S.No	Programme Educational Objectives	QUESTIONARIES	Excellent(5)	Very good(4)	Good(3)	Satisfactory (2)	Poor(1)
I.	Employability	How comfortable you were in the training/initial period in your first employment					
		Professionally competent for the requirements of Organization					
		Excel in analytical and problem solving skills in multidisciplinary environment					
		Ability to exhibit and communicate knowledge of basic engineering sciences.					
II.	Higher Studies	Ability to learn new technology					
		Willingness in lifelong learning for professional development					
		Willingness in higher education					
III.	Entrepreneurship	You work for business incubation/ Research and Development at your company					
		You plan to start a new company					
		You exhibit good leadership qualities					
IV.	Responsible Citizen	Development of Ethical Attitude					
		Ability to work in team					
		Disseminate universal science and technology for the society					

How well is the institute keeping in touch with you since graduation? (Please put a ☐ in the appropriate box).

a. Extremely Well   b. Very Well   ☐

c. Somewhat Well   ☐   d. Not at all Well   ☐

Date :

Place: Signature of Alumni

Consolidated Alumni Survey

Total no. of respondents, N:
Programme:
Academic Year:

Parameter	No. of students rated '5'	%age of students	No. of students rated '4'	%age of students	No. of students rated '3'	%age of students	No. of students rated '2'	%age of students	No. of student rate 4 '1'	%age of students	Weighted Avg %age
	A5	A5/N	A4	A4/N	A3	A3/N	A2	A2/N	A1	A1/N	
How comfortable you were in the training/initial period in your first employment											
Professionally competent for the requirements of Organization											
Excel in analytical and problem solving skills in multidisciplinary environment											
Ability to exhibit and communicate knowledge of basic engineering sciences.											
Ability to learn new technology											
Willingness in lifelong learning for professional development											
Willingness in higher education											
You work for business incubation/ Research and											

Development at your company

Parameter	No. of students rated '5'	%age of students	No. of students rated '4'	%age of students	No. of students rated '3'	%age of students	No. of students rated '2'	%age of students	No. of student rate4 '1'	%age of students	Weighted Avg %age
	A5	A5/N	A4	A4/N	A3	A3/N	A2	A2/N	A1	A1/N	
You plan to start a new company											
You exhibit good leadership qualities											
Development of Ethical Attitude											
Ability to work in team											
Disseminate universal science and technology for the society											

Weighted average, $\ A (Alumni) = (5*A5 + 4*A4 + 3*A3 + 2*A2 + 1*A)/5$

Avg %age= (WA(Alumni)/N]* 100

Parameter	PO1	PO2	PO3	PO4	PO5	PO6	········ ····	PO12	PSO1	PSO2	PSO3
How comfortable you were in the training/initial period in your first employment											
Professionally competent for the requirements of Organization											
Excel in analytical and problem solving skills in multidisciplinary environment											
Ability to exhibit and communicate knowledge of basic engineering sciences.											
Ability to learn new technology											
Willingness in lifelong learning for professional development											
Willingness in higher education											
You work for business incubation/ Research and Development at your company											
You plan to start a new company											
You exhibit good leadership qualities											
Development of Ethical Attitude											
Ability to work in team											
Disseminate universal science and technology for the society											

The weighted average percentage will provide the indirect PO attainment.
In this way the Average indirect PO/PSO attainment using both Program exit (PI- P: Program exit, I-Indirect) and Alumni survey (AI- A: Alumni survey, I-Indirect) will be computed. The overall weighted PO/ŒO attainment using Program exit and Alumni survey would be computed as: Overall weighted PO/PSO attainment using Indirect tools = 0.5*PI + 0.5*AI

Average PO/PSO Attainment using Program Exit Sukey (P)														
Average PO/PSO Attainment using Alumni Survey (AI)														
Overall indirect PO/PSO Attainment , B= 0.5*PI + 0.5*AI	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	IPSO1	IPSO2	IPSO3

The weighted average of direct (80%) and indirect (20%) PO/PSO attainment shall be computed to know about overall PO/PSO attainment.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO II		PS 0 1	PSO 2	PSO 3
Average Direct PO/PSO Attainment (A)	DI	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D-PSO1	D-PSO2	D-PSO3
Aver 9e indirect PO/PSO Attainment (B)	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	IPSO1	IPSO2	IPSO3
Overall PO/PSO Attainment— A*0.8 + B*0.2	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O-PSO1	O-PSO2	O-PSO3

The bar graphs shall be plotted to show PO/PSO attainment and subsequent analysis. The POs/PSOs attainment levels shall be analyzed to plan the subsequent actions.

13. PROCESS FOR PEOs ATTAINNENT AND ANALYSIS

The assessment and attainment of PEOs shall include both direct and indirect tools as follows:

1. Direct Tools (Weightage: 60%):
a. Program Outcome/Program Specific Outcome attainment level as calculated in the previous section for the mapped PEOs. Weightage: 80%
2. Indirect Tools (Weightage: 40 %):
a. Program exit survey: Weightage: 10%
b. Alumni survey: weightage: 10%
c. Employer feedback: Weightage: 20%

For direct attainment, the Program Outcome/Program Specific Outcome attainment level as calculated in the previous section shall be used directly for the mapped PEOs.
For Indirect attainment, the weighted average will collectively provide the Indirect PEO attainment.
The weighted average of direct (60%) and indirect (40%) attainment shall be computed to know about overall PEO attainment.

The PEO attainment matrix shall be formulated and respective PEO attainment shall be analyzed for subsequent actions.

Levels of attainment for PEOs

PEO Attainment	Level of Attainment
Greater than equal to 70%	Excellent
Greater than equal to 60°/» and less than 70%	Very Good
Greater than equal to 50% and less than 60%	Good
Greater than equal to 40% and less than 50%	Satisfactory
Less than 40%	Not Satisfactory

PEO Attainment Matrix:

PO/PSOs \ PEOs	PEO1	PEO2	PEO3	PEO4	PEO5
PO 1					
PO 2					
PO 3					
PO 4					
PO 5					
PO 6					
PO 7					
PO 8					
PO 9					
PO 10					
PO11					
PO12					
PSO 1					
PSO2					
PSO3					
Average PEO attainment					
Level of PEO Attainment					
Whether the expected level of PEO is attained or not? (Yes/No)					

The PEO attainment levels shall be analyzed to plan the subsequent actions.

Course Outcome Attainment Report (Session-...)

Data:

To

Department Academic Committee (DAC)
Department of.......

Subject: Submission of Course Outcome Attainment Report of the course........
The   course   outcome   attainment   report   for   the   course
'....................................'submitted for the perusal and review of Department
Academic Committee members

Course Title with Code	CO	CO Statement	Attainment Percentage			Target Achieved/ Not Achieved	Action planned to improve the CO Attainment
			Direct Attainment	Indirect Attainment	Overall Attainment		
	CO1						
	CO2						
	CO3						
	CO4						
	CO5						
	CO6						

Graphical Analysis as downloaded from EMS

Course Coordinator

Academic Year:.........(odd/even semester)

Institute/Branch: MRU-Faculty of ....

Program:

Consolidated CO-Direct Indirect Attainment Report (As downloaded from EMS) for all the Courses in all semesters

S. No.	Class/Semester	Course Title	Course Code	Lecture type	Course Coordinator	CO	Direct Attainment	Indirect Attainment	Overall Attainment
1	B.Tech. CSE Sem 1					CO1			
						CO2			

EMS Coordinator

Academic Year:.................{odd/even semester}

Institute/Branch: MRU-Faculty of ....

Program:

S. No.	Class/ Sem	Course Title	Course Code	Lecture Type	Course Teacher	CO PO Direct Indirect Attainment					Target Achieved / Not Achieved	Action Planned	Recommendations of DAC
						CO	Direct Attainment	Indirect Attainment	Overall Attainment				
1						CO1							
						CO2							

Details of DAC Members	Signatures with Date

Registrar
MANAV RACHNA UNIVERSITY
FARIDABAD

This is a published document approved by **4th Academic Council Meeting held on 12th April, 2017 and is attested** .