1. Course Outcomes and Program Outcomes (120)

Establish the correlation between the Courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs) (20)

Program Outcomes:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

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

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

10. 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.

11. 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.

12. 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.

PSO-Program Specific Outcomes

PSO 1: With the technical skills acquired, the graduates will be able to apply them in industrial practices e.g. in effective separation and purification in petroleum refineries and petrochemical industries, unit operations and processes in various chemical and allied industries and would be ready for any challenges in chemical engineering and technology work field and research.

PSO 2: Graduates will be able to participate in critical thinking and problem solving related to chemical engineering that requires analytical and design competences in different industries.

PSO 3: Graduates will be equipped to pursue entrepreneurial and leadership activities related to Chemical and allied industries

Course Outcomes (COs)
SAR should include course outcomes of One course/Semester (3rdto8th) of study, however, should be prepared for all courses and made available as evidence, if asked) (05)

Note: Number of Outcomes for a Course is expected to be around 6.

Course Name: Fundamentals of Chemical Engineering [CH 384]

Semester: Third ; Year of study: 2017-18

CH 384.1	*Determine* the number of degrees of freedom in a process
CH 384.2	*Calculation* of composition analysis of a gas mixture.
CH 384.3	*Compare* ideal and real gas equation of state.
CH 384.4	*Develop* dimensionless groups by correlating variables in a physical phenomenon.
CH 384.5	*Use* Psychometric chart to determine properties of moist air.

Course Name: Fluid Flow Operation [CH 487]

Semester: Fourth; Year of study: 2017-18

CH 487.1	*Identify* the various fluid properties and flow regimes of fluids and express some basic terms related to fluid flow phenomena.
CH 487.2	*Formulate* and establish the basic equations of fluid flow, integral equation of flow, momentum equation under steady state condition, Bernoulli's equation etc.
CH 487.3	*Describe* and *relate* the flow of incompressible fluid in conduits and understand the effects of roughness, restriction, head loss, friction of flow etc.
CH 487.4	*Select* and *evaluate* the performance of various fluid transport and metering devices like pumps, compressors, orificemeter, venturimeter, rotameter, pitot tube etc.
CH 487.5	*Develop* basic equations of fluid flow through packed bed and fluidization phenomenon of gas solid / liquid solid systems and understanding of compressible fluids.

Course Name: Chemical Reaction Engineering I [CH 582]

Semester: Fifth; Year of study: 2017-18

CH 582.1	*Develop* the reaction rate equation and *compute* kinetics of the given reaction system
CH 582.2	*Analyse* and a*pply* kinetic data using integral or differential method for development of kinetics and thermodynamics.
CH 582.3	*Design* of the batch and steady state flow reactor i.e. plug flow (PFR) and mixed flow reactors (MFR).
CH 582.4	*Select* best multiple reactor systems for a particular reaction.
CH 582.5	Quantitative *evaluation* of the performance of MFRs, PFRs and multiple reactor systems.

Course Name: Heat Transfer Operation [CH 684]

Semester: Sixth; Year of study: 2017-18

CH 684.1	*Apply* the principle of different modes of heat transfer for different situation and for different shapes of solids.
CH 684.2	*Compute* the heat transfer coefficients related to convection (free and force)and condensation selecting suitable correlations.
CH 684.3	*Apply* the laws of radiations to solve problems in relevant engineering fields.
CH 684.4	*Perform* thermal analysis for design of heat exchanger and evaporator.
CH 684.5	*Apply* and *relate* the fundamentals of boiling for quantification of the maximum heat flux.

Course Name: Process Equipment Design [CH783]

Semester: Seventh; Year of study: 2017-18

CH 783.1	*Interpret* and *quantify* data from the literature, Handbook and Code book.
CH 783.2	*Analyse, interpret* and design heat transfer equipment such as heat exchangers and condensers for the process with due stress on safety aspect and
CH 783.3	*Compute* mass and energy balance equations for double effect evaporator for design optimization.
CH 783.4	*Design* of pressure vessel and storage tank considering safety and environmental aspects.
CH 783.5	*Assessment* and *Engineering drawing* of chemical equipments required in a process plant.

Course Name: Transport Phenomena [CH 881]

Semester: Eighth; Year of study: 2017-18

CH 881.1	*Apply* basic concepts of transport phenomena and thus a*nalyze* the role of intermolecular forces in transport process.
CH 881.2	*Demonstrate* the role of molecular transport mechanism and thus *develop* the analogy between heat, mass and momentum transport.
CH 881.3	*Apply* the conservation concept and *construct* the property balance equation for computation both of molecular and convective transport.
CH 881.4	*Develop* the property balance equation to *quantify* the real plant problems
CH 881.5	*Apply* concepts of continuity and Navier–Stokes equation for quantification of complex plant problems.

CO-PO matrices of courses selected in 3.1.1 (six matrices to be mentioned; one per semester from 3rd to 8th semester) (05)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C202.1												

Note:

    1. ***Enter correlation levels 1, 2 or 3 as defined below:***

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put "-"

    2. ***Similar table is to be prepared for PSOs***

CO-PO Mapping Matrix:

Course Name: [CH 384] Fundamentals of Chemical Engineering; Semester: Third

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 384.1	3	2	2	2	1	1	1	1				1
CH 384.2	3	2	2	2	2	2	2	1				1
CH 384.3	3	2	2	1	1							1
CH 384.4	3	2	2	2	2	1		1				1
CH 384.5	2	1	2	3	1	2	2	1				1
Sum	14	9	10	10	7	6	5	4				5
Av.	2.8	1.8	2	2	1.4	1.2	1	0.8				1

Course Name: [CH 487] Fluid Flow Operation; Semester-Fourth

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 487.1	2	1	1	1	-	-	1	1	-	-	-	1
CH 487.2	2	2	1	1	1	-	1		-	-		1
CH 487.3	2	1	1	2	-	2	1	-	-	-	1	1
CH 487.4	3	1	2	1	3	1	1	1	-	-	1	1
CH 487.5	3	2	2	1	1	1	1	1	-	-	1	1
Sum	12	7	7	5	5	4	5	3	-	-	3	5

| Av. | 2.2 | 1.4 | 1.4 | 1 | 1 | 0.8 | 1 | 0.6 | - | - | 0.6 | 1 |

Course Name: [CH 584] Chemical Reaction Engineering I; Semester-Fifth

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 584.1	2	2	2	2	1	1	2	1	-	-	-	1
CH 584.2	2	2	2	2	3	1	2	1	-	-	1	1
CH 584.3	2	2	2	2	2	1	1	1	-	-		1
CH 584.4	2	2	2	2	1	1	1	1	-	-	1	1
CH 584.5	2	2	2	2	1	1	2	1	-	-	1	1
Sum	10	10	10	10	8	5	7	5	-	-	3	5
Av.	2	2	2	2	1.6	1	1.6	1	-	-	0.6	1

Course Name: [CH 684] Heat Transfer Operation; Semester: Sixth

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 684.1	2	3	1	1	2	1	2	-	-	-	-	1
CH 684.2	2	3	1	3	2	1	2	-	-	-	-	1
CH 684.3	1	3	1	1	2	1	2	1	-	-	1	1
CH 684.4	2	3	3	2	2	1	3	1	-	-	1	1
CH 684.5	2	1	1	2	2	1	2	1	-	-	1	1
Sum	9	13	7	9	10	5	11	3	-	-	3	5
Av.	1.8	2.6	1.4	1.8	2	1	2.2	0.6	-	-	0.6	1

Course Name: [CH 783] Process Equipment Design, Semester: Seventh

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 781.1	3	2	1	2	1	2	2	1	-	-	1	1
CH 781.2	3	1	3	2	1	2	2	2	-	-	1	2
CH 781.3	3	3	3	3	1	2	2	1	-	-	1	2
CH 781.4	3	1	3	2	1	2	2	2	-	-	2	2
CH 781.5	3	1	1	1	2	2	1	2	-	-	1	1
Sum	15	8	11	11	6	10	9	8	-	-	6	8

| Av | 3 | 1.6 | 2.2 | 2.2 | 1.2 | 2 | 1.8 | 1.6 | - | - | 1.2 | 1.6 |

Course Name: [CH 881] Transport Phenomena, Semester: Eighth

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 881.1	3	2	1	1	1	1	1	1	-	-	-	1
CH 881.2	3	2	1	1	2	1	1	1	-	-	-	1
CH 881.3	3	3	2	2	2	1	1	1	-	-	-	2
CH 881.4	3	3	2	3	2	1	1	1	-	-	1	2
CH 881.5	3	2	2	3	2	1	1	1	-	-	1	2
Sum	**15**	**12**	**8**	**10**	**9**	**5**	**5**	**5**	**-**	**-**	**2**	**8**
Av.	**3**	**2.4**	**1.6**	**2**	**1.8**	**1**	**1**	**1**	**-**	**-**	**0.4**	**1.6**

Table B.3.1.2 (a)

CO-PSO matrices of courses selected in 3.1.1 (six matrices to be mentioned; one per Semester from 3rd to 8th semester) (05)

CO-PSO Mapping Matrix:

Course Name: [CH 384] Fundamentals of Chemical Engineering; Semester: Third

COs	PSO1	PSO2	PSO3
CH 384.1	1	1	-
CH 384.2	1	1	-
CH 384.3	1	1	-
CH 384.4	1	2	-
CH 384.5	1	1	-
Sum	**5**	**6**	**-**
Av.	**1**	**1.2**	**-**

Course Name: [CH 487] Fluid Flow Operation; Semester-Fourth

COs	PSO1	PSO2	PSO3
CH 487.1	1	-	-
CH 487.2	2	1	-
CH 487.3	1	-	-
CH 487.4	2	1	-
CH 487.5	1	1	-
Sum	**7**	**3**	**-**

| Av. | 1.4 | 1 | - |

Course Name: [CH 584] Chemical Reaction Engineering I; Semester-Fifth

COs	PSO1	PSO2	PSO3
CH 584.1	1	1	-
CH 584.2	1	1	-
CH 584.3	1	1	-
CH 584.4	1	1	-
CH 584.5	1	1	-
Sum	**5**	**5**	**-**
Av.	**1**	**1**	**-**

Course Name:[CH 684] Heat Transfer Operation; Semester: Sixth

COs	PSO1	PSO2	PSO3
CH 684.1	1	1	--
CH 684.2	1	1	-
CH 684.3	1	1	-
CH 684.4	2	1	-
CH 684.5	1	-	-
Sum	**6**	**4**	**-**
Av.	**1.2**	**1**	**-**

Course Name: [CH 783] Process Equipment Design, Semester: Seventh

COs	PSO1	PSO2	PSO3
CH 781.1	2	-	-
CH 781.2	2	3	-
CH 781.3	2	2	-
CH 781.4	2	3	-
CH 781.5	1	-	-
Sum	**9**	**8**	**-**
Av.	**1.8**	**1.4**	**-**

Course Name: [CH 881] Transport Phenomena, Semester: Eighth

COs	PSO1	PSO2	PSO3
CH 881.1	-	2	--
CH 881.2	-	2	-
CH 881.3	2	2	-
CH 881.4	2	2	-
CH 881.5	2	2	-
Sum	**6**	**10**	**-**
Av.	**2**	**2**	**-**

Table B 3.1.2 (b)

Program level Course-PO matrix of all courses INCLUDING first year courses (10)

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1st Semester												
PH 101	2.50	2.00	1.50									
PH 101L	2.00								1.00			
CH 102	2.60	1.60				0.40	0.60					0.60
CH 102L	2.50	1.75		1.00						1.00		
MA 103	3.00	3.00	1.20	0.20					0.20			2.00
CE 104	2.60	2.20	0.20	0.80	0.60							
HU 105	0.00	1.00		1.00		1.00	1.00	1.33	3.00	2.25		3.00
CE 106	3.00	3.00	2.83	2.57	2.14	2.57	1.00					
CS 107	2.00	2.33	3.00	1.33	2.00							
CE 108	1.80	1.40							1.20	1.80		
2nd Semester												
PH 201	1.75	1.33	1.25		1.00							

PH 201L	2.00								1.00			

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 202	2.80	2.20	0.80			0.60	0.60		1.00	1.00		1.00
CH 202L	2.00	2.00		1.25		0.50	1.00			1.00		
MA 203	3.00	3.00	2.00									2.00
CE 204	3.00	2.25	1.50	1.00								
CE 204L	3.00	2.00		3.00	3.00							
EE 205	3.00	3.00										
EE 205L				3.00								
ME 207	3.00	3.00	1.67		2.00	3.00						1.00
ME 208	1.60	2.00							1.00	1.60		
3rd Semester												
MA 301	3.00	3.00										2.00
ME 302	3.00	2.00	2.60	1.40	1.40							1.00
ME 302L	2.00	1.80	2.30	1.80	1.30							1.00
EE 303	3.00	2.40										1.80
EE 303L	3.00	1.66		1.00						0.67		1.66
CH 384	2.80	1.80	2.00	2.00	1.40	1.20	1.00	0.80				1.00
CH 385	2.00	1.80	1.60	1.60	1.00	2.00	2.60	1.00		1.00		2.00
CH 385L	2.00			2.00		1.00		1.00	3.00	1.00		1.00
CH 386	1.40	0.60	0.80	0.80		1.20	0.80	0.80		1.00		1.20
CH 387	2.00				1			2.00		1.00		1.00
CH 388	2.00				1.00			1.00	1.00	2.00		1.00
4th Semester												
MA 411	3.00	2.40	1.60	1.00	1.00				1.00			1.40
HU 402	0.00	1.00				1.33	1.00	1.33	1.16	1.00	1.00	3.00
HU 403	0.00	1.80		1.50		2.20	1.20	1.80	2.00	3.00		3.00

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 404	3.00	2.00		0.20						0.40		1.40
EE 404L	3.00	1.75		0.75						0.50		1.50
CH 485	3.00	1.60	1.60	1.40	0.60	0.40	0.60	0.20	0.40	0.80	0.40	1.20
CH 486	3.00	2.40	1.20	1.60	1.60	1.60	1.20	1.40				1.80
CH 486 L	1.00			1.60		0.80		0.80	1.80	1.00		1.00
CH 487	2.20	1.40	1.40	1.00	1.00	0.80	1.00	0.60			0.60	1.00
CH 487 L	2.00			3.00		1.00	0.00	2.00	2.00	1.00		1.00
CH 488	2.00				1.00			1.00	2.00	2.00		1.00
5th Semester												
HU 501		1.00				1.50	1.00	1.50	2.00	1.00	1.00	2.66
CH 582	2.00	2.00	2.00	2.00	1.60	1.00	1.60	1.00			0.60	1.00
CH582L	1.33			2.00				1.00	2.00	1.00		1.00
CH 583	2.60	2.20	1.40	1.40	1.40	0.60	0.80	0.40				1.00
CH 583L	2.00	0.20	0.20	2.00		1.00		1.00	2.00	1.00		1.00
CH 584	3.00	2.40	1.60	1.20	1.40			1.00				2.00
CH 584L	1.67			2.00		0.33		1.00	1.67	1.00		1.00
CH 585	2.20	1.80	1.60	1.60	1.00	1.40	2.00	1.00				1.60
CH 586	3.00	2.60	1.80	2.00	1.40	1.00	1.00	0.60		1.00		1.40
CH 586L	2.00			1.00		1.00		1.00	2.00	1.00		1.00
CH 587	2.00					1.00		1.00	2.00	3.00		1.00
6th Semester												
CH 681	3.00	2.80	2.60	3.00	2.00	1.80	1.40	1.00			0.80	2.00
CH 682	3.00	2.40	2.40	1.60	2.00	1.60	1.20	2.20	0.80	1.20	2.60	2.00
CH 683	3.00	2.60	1.80	1.80	1.40		1.40	0.40		0.80		2.00
CH 683L	2.00			2.00		1.00		1.00	2.00	1.00		1.00

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CH 684	1.80	2.60	1.40	1.80	2.00	1.00	2.20	0.60			0.60	1.00
CH 684L	2.00	2.00		2.00		1.00		1.00	2.00	1.00		2.00
CH 685	2.40	2.00	2.00	1.80	1.00	1.40	1.40	0.80	1.00	1.40		2.40
CH 685L	2.00			2.00		2.00	1.00	1.00	2.00	1.00		1.00
CH 686	3.00	3.00	2.00	2.00	2.20	1.20		1.00				1.60
CH 686L	2.00	1.25		2.00	0.60	1.00		1.00	2.00	1.00		1.00
CH 687	2.00					1.00		1.00	2.00	3.00		1.00
7th Semester												
CH 781	2.60	2.60	2.40	2.20	1.40		0.60	0.60	1.00	1.20		1.40
CH 782	2.40	2.00	1.80	1.20	1.40	1.20	2.00	0.40				1.00
CH 783	3.00	1.60	2.20	2.20	1.20	2.00	1.80	1.60			1.20	1.60
CH 784	2.80	2.20	1.20	1.20	1.20	1.60	3.00	1.40				1.20
CH 785	2.20	2.20	2.20	1.40	1.80	2.00	2.00	1.80				2.00
CH 786	2.40	2.20	1.20	1.60		0.60		0.20				1.20
CH 787	3.00	3.00	2.00	1.00	3.00	2.00	2.00	2.00	2.00	3.00	1.00	3.00
CH 788	3.00	3.00	3.00	3.00	2.00	1.00	2.00	2.00	3.00	2.00	2.00	2.00
8th Semester												
CH 881	3.00	2.40	1.60	2.00	1.80	1.00	1.00	1.00			0.40	1.60
CH 882	3.00	2.50	3.00	2.25	1.00	1.25	1.50	1.25			1.00	1.00
CH 883	3.00	2.60	1.60	0.60	1.20	1.40	1.20	1.00				1.20
CH 884	1.80	1.40	1.20	1.20	0.80	1.00	1.00	0.20				1.80
CH 885	2.40	1.20	1.40	0.80	0.40	2.00	3.00	0.80			0.20	3.00
CH 887	3.00	3.00	2.00	1.00	1.00			2.00	3.00	3.00		3.00
Average	**2.45**	**2.08**	**1.75**	**1.60**	**1.41**	**1.26**	**1.38**	**1.08**	**1.71**	**1.36**	**0.96**	**1.53**

Table B.3.1.3 (a)

Program level Course-PSO matrix of all courses INCLUDING first year courses (10)

Course	PSO1	PSO2	PSO3
1st Semester			
PH 101	0.80	1	
PH101L	1.00	2	
CH102	1.00	0.6	
CH102L	0.75	1	
MA 103		3	
CE 104			
HU 105			
CE 106	0.28	1.4	
CS 107	0.60	2	0.33
MA 108	0.60		
2nd Semester			
PH201	0.25	1.25	
PH201L	1.00	2	
CH 202	1.20	0.60	
CH202L	1.00	0.80	3
MA203		3	
ME 204		1.00	
ME204L		1.00	
EE 205			
EE 205L			
ME 207	0.80		
ME 208	0.40		
3rd Semester			
MA 301	-	3	-
ME 302	2.8	3	1
ME 302L	2.00	2.00	1.00
Course	**PSO1**	**PSO2**	**PSO3**
EE 303		0.40	

Course	PSO1	PSO2	PSO3
EE 303L		0.67	
CH 384	1.00	1.20	
CH 385	1.80		0.4
CH 385L	2.00		
CH 386	0.40	0.40	
CH 387	1.00	1	
4th Semester			
EE 404		0.40	
EE 404L		0.5	
MA 411	1.2	1	
CH 485	1.20	0.4	
CH 486	1.20	1.5	1
CH 486L	1.40	0.6	
CH 487	2.00	1	
CH 487L	2.00	1	
5th Semester			
CH 582	3.00	1	
CH 582L	2.00	1.5	
CH 583	2.00		
CH583 L	1.80	1	
CH 584	1.20	1.2	
CH 584L	2.00	1	
CH 585	2.00		
CH 586	1.00	0.6	
CH 586L	1.00		
CH 587			
6th Semester			
CH 681	1.60	2	
CH 682	0.40		2.2
Course	**PSO1**	**PSO2**	**PSO3**
CH 683	1.80	1.6	

CH 683L	2.00	1	
CH 684	1.20	0.8	
CH 684L	2.00	1.33	
CH 685	3.00	0.4	
CH 685L	3.00		
CH 686	1.60	1.2	
CH 686L	1.00	1	
7th Semester			
CH 781	3.00	2	
CH 782	1.20	0.4	
CH 783	1.80	1.6	
CH 784	1.80	0.8	0.2
CH 785	1.40	0.4	1
CH 786	2.20	0.2	
CH 787		3.00	1.00
CH 788	1.00	3.00	1.00
8th Semester			
CH 881	1.20	2	
CH 882	2.50	2	
CH 883	1.80	0.8	0.4
CH 884	2.80	1.2	
CH 885	1.20	0.4	0.4
CH 887	2.00	3	1.00
Average	**1.49**	**1.33**	**1.00**

Table B 3.1.3 (b)

Attainment of Course Outcomes (50)

Describe the assessment processes used to gather the data upon which the evaluation of Course Outcome is based (10)

• *Examples of data collection processes may include, but are not limited to –*

- Specific exam/tutorial questions

- Assignments

- Laboratory tests

- Project evaluation,

- Student portfolios.

• *A portfolio is a collection of artefact that demonstrate skills, personal characteristics, and accomplishments created by the student during study period, internally developed assessment exams, project presentations, oral exams etc*

Direct Assessment:

The Department adopts direct assessment methods for evaluating the course outcomes based on the data collected from the following assessment processes:

a) University Examinations i.e End semester Examinations
b) Class Tests
c) Assignments
d) Laboratory test/viva
e) Project evaluation
f) Grand Viva-voce
g) Seminar presentations/ Group discussions
h) Appraisal from Industries
i) General Impression

Methods for Direct assessment:

1. **University Examination**
   End Semester examination is the most important tool for assessing course outcomes attainment. Examination is more focused on attainment of course outcomes through a descriptive mode.

   • Gauhati University conducts 100 marks theory examination.

   • Assessment and moderation of papers are done as per University norms.

   • Paper examiners are selected by the Controller of University for evaluating the answer sheets.

2. **Class Tests**: Two to three class tests are conducted during the session. Each test paper is set focusing on attaining the course outcomes. Average of the better marks obtained from any two tests is considered for the Internal assessment for that particular subject.

   40% weightages are given from class tests in the internal assessment. After assessment of the answer sheets, the students are counselled accordingly if asked for.

3. **Assignments work:** Assignments and home works are assigned to the students and accordingly they are evaluated. Average is taken at the end. 10% weightages are given from the assignment work for the internal assessment for each theory subject.

4. **Laboratory assessment:** After completion of every lab, reports are to be submitted on regular basis which are assessed. Continuous assessment is carried out as per the rubrics given in the following Table 3.2.1A. Viva-voce is carried out for every laboratory.

Table 3.2.1A

Rubrics for Laboratory assessment

Report (10)	Attendance (20)	Viva (20)	Total (50)

5. **Project Evaluation**: Evaluation of the student based on the project work is also an important criterion for attainment of course outcomes. One project each is given to the students in VII and VIII semesters. Experimental projects are allotted to the students in VII semester and theoretical projects in VIII semester. Evaluations are done based on the rubrics given in Table 3.2.1.B & Table 3.2.1.C

Table 3.2.1.B

Rubrics for evaluation of Project I in VII Semester

Seminar Presentation on Literature survey & Methodology of the Project (20)	Final Seminar Presentation on completion of the Project (30)	Final Report (20)	Guide's Impression (30)

Students are evaluated for the VIII semester project in a similar manner (Table 3.2.1.B) an external examiner is also appointed by the University for evaluating the project work.

Table 3.2.1.C

Rubrics for evaluation of Project II in VIII Semester

Seminar presentation on Literature survey/Process selection (10)	Seminar presentation on Material & Energy balance Calculations 10)	Seminar presentation on Design of any equipments used in the process (10)	Final Report (30)	Guide's evaluation (40)	Evaluation by External Examiner (50)

6. **Grand Viva-voce:**

   Grand Viva-voce examination is conducted at the end of final semester where external examiners are appointed by the University to assess the students' knowledge in various subjects of Chemical Engineering.

7. **Seminar presentations/ Group discussions:**

   These are conducted with the help of experts recommended by the Training & Placement Cell in three sections to enhance students' overall aptitude,

presentation/communication and group discussion skills so that they are well equipped for placement drives. Evaluation is done by the following mechanism:

- External evaluation-40 marks
- Internal evaluation-10 marks

8. Industrial Training

Students of VI semester have to undergo one month industrial training just after completion of their end semester examination which is scheduled by the Training & Placement Cell of the college. After completion of the training, appraisal for each student (in standard format) is collected from the concerned industry which is included in the assessment calculation. Also, the students are to give a power point presentation in groups on the operation of the industry. The assessment on factory/industry training is done based on the rubrics given in Table 3.2.1.D.

Table 3.2.1.C

Rubrics for evaluation of Factory training in VII Semester

Seminar Presentation on industrial training (25)	Reports (20)	Appraisal from Industries (5)

9. General Impression

A weightage of 20% of the total sessional marks is given for General Impression which is based on a collection of information regarding the student class performance e.g, attentiveness to class lectures, promptness in responding to any questions asked in the class, overall behaviour in the class, activity in group, etc.)

Table 3.2.1.D

Rubrics for evaluation of General Impression

Attentiveness to Lectures (5)	Class Interaction (5)	Overall behaviour in the class (5)	Activity in Group (5)

Record the attainment of Course Outcomes of all courses with respect to set attainment levels (40)

- *Program shall have set Course Outcome attainment levels for all courses*
- *The attainment levels shall be set considering average performance levels in the*
- *University Examination or any higher value set as target for the assessment years*

Attainment level is to be measured in terms of student performance in internal assessments with respect to the Course Outcomes of a course

- *Performance in the University Examination.*

Measuring Course Outcomes attained through University Examinations
Target is stated in terms of percentage of students getting more than the university average marks or more as selected by the Program in the final examination. The program has chosen an attainment level on its own with justification.

a. *Attainment is measured in terms of actual percentage of students getting set percentage of marks.*
b. *If targets are achieved then all the course outcomes are attained for that year. Program sets higher targets for the following years as a part of continuous improvement.*
c. *If targets are not achieved the program puts in place an action plan to attain the target in subsequent years.*

Measuring CO attainment through Internal Assessments:

1. *Target is stated in terms of percentage of students getting more than class average marks in the assessment instruments (midterm tests, assignments, mini projects, reports and presentations etc. as mapped with the COs).*
2. *Attainment is measured in terms of actual percentage of students getting set percentage of marks.*

3. *If targets are achieved then the course outcomes are attained for that year. Program sets higher targets for the following years as a part of continuous improvement.*
4. *If targets are not achieved the program puts in place an action plan to attain the target in subsequent years.*

Following attainment levels are set for the courses of curriculum (2013-17):

Table 3.2.2(A) Set target level

CO Attainment Method	Attainment Level		
	1	**2**	**3**
Internal Assessment	30-50% student scoring more than 60% marks in the class tests	50-80% student scoring more than 60% marks in the class tests	80-100% student scoring more than 60% marks in the class tests
University	30-50% student scoring more than 50% marks in the end semester examination	50-80% student scoring more than 50% marks in the end semester examination	80-100% student scoring more than 50% marks in the end semester examination

Course Outcome Attainment:

As per University Rule, the marks distribution for the theory subjects is as follows:

Semester	End Semester marks	Internal assessment marks	Total marks
I-VI	100	50	150
VII-VIII	100	75	175

Thus, for semesters (I-VI) weightage given to
University Examination: (100/150)*100=66.67≈67%
Internal Assessment: (50/150)*100=33.33≈33%
For semesters (VII-VIII) weightage given to
University Examination: (100/175)*100=57.14≈57%
Internal Assessment: (75/150)*100=42.86≈43%

For example:

If, Attainment through University Examination = 3

and Attainment through Internal Assessment = 2

Then, Overall CO attainment level = 0.67*3+0.33*2 = 2.67

Overall CO attainment (%) = (2.67/3)*100 = 89%

Record of attainment of COs of all courses with respect to set attainment levels

Curriculum: 2013-2017

SR. No.	Subject	Course Code	Internal assessment			University Exam			Overall CO attainment (%)	Overall CO attainment level
			Target (%)	Attainment (%)	Level	Target (%)	Attainment (%)	Level		
1	Physics I	PH101	60%	66.67	2	50%	66.67	2	66.67	2.00
2	PhisicsI-Lab	PH101L	60%	33.33	1	-	-	-	33.33	1.00
3	Chemistry I	CH102	60%	100	3	50%	66.67	2	77.67	2.33
4	Chemistry I Lab	CH102L	60%	100	3	-	-	-	100.0	3.00
5	Mathematics I	MA103	60%	100	3	50%	33.33	1	55.33	1.66
6	Elements of Civil Engg.	CE104	60%	100	3	50%	0	0	33.0	0.99
7	Eng Comm. & Tech Report Writing	HU105	60%	100	3	50%	66.67	2	77.67	2.33
8	Engg. Graphics I	CE106	60%	100	3	50%	33.33	1	55.33	1.66
9	Introduction to computing	CS107	60%	66.67	2	50%	100	3	89.0	2.67
10	Workshop Practice I	ME 108	60%	100	3	-	-	-	100.0	3.00
11	Physics II	PH201	60%	33.33	1	50%	33.33	1	33.33	1.00
12	Physics II Lab	PH201L	60%	66.67	2	-	-	-	66.67	2.00
13	Chemistry II	CH202	60%	33.33	1	50%	66.67	2	44.33	1.33
14	Chemistry II Lab	CH202L	60%	100.0	3	-	-	-	100.0	3.00
15	Mathematics II	MA 203	60%	100.0	3	50%	33.33	1	55.33	1.66
16	Engg Mechanics & Strength of material	CE 204	60%	100.0	3	50%	0	0	33.0	0.99
17	Engg Mechanics &	CE 204L	60%	100.0	3	-	-	-	100	3.00

	Strength of material Lab									
18	Basic Electrical Engg I	EE 205	60%	33.33	1	50%	33.33	1	33.33	1.00
19	Basic Electrical Engg I Lab	EE 205L	60%	33.33	1	-	-	-	33.33	1.00
20	Engg Graphics II	ME 207	60%	100.0	3	50%	66.67	2	77.67	2.33
21	Workshop Practice II	ME 208	60%	100.0	3	-	-	-	100	3.00
22	Mathematics III	MA 301	60%	100.0	3	50%	0	0	33.0	0.99
23	Engg Mechanics II	ME 302	60%	100.0	3	50%	66.67	2	77.67	2.33
24	EM II Lab	ME 302L	60%	100.0	3	-	-	-	100	3.00
25	Electro Technology I	EE 303	60%	33.33	1	50%	33.33	1	33.33	1.00
26	Electro Technology I Lab	EE 303L	60%	100.0	3	-	-	-	100	3.00
27	FOCE	CH 384	60%	100.0	3	50%	33.33	1	55.33	1.66
28	CPI	CH 385	60%	100.0	3	50%	66.67	2	77.67	2.33
29	CPI Lab	CH 385L	60%	100.0	3	-	-	-	100.0	3.00
30	MSCE	CH 386	60%	100.0	3	50%	33.33	1	55.33	1.66
31	CED	CH 387	60%	100.0	3	-	-	-	100.0	3.00
32	General Proficiency	CH 388	-	-	-	50%	100	3	100.0	3.00
33	Sociology & Accountancy	HU 402	60%	66.67	2	50%	33.33	1	44.33	1.33
34	Comn Skill	HU 403	60%	100.0	3	50%	33.33	1	55.33	1.66
35	Electro Technology II	EE 404	60%	66.67	2	50%	66.67	2	66.67	2.00
36	ETII-Lab	EE 404L	60%	100	3	-	-	-	100	3.00
37	Adv. Maths & Num Analysis	MA 411	50%	33.33	2	50%	33.33	1	44.33	1.33
38	Process Calculation (PC)	CH 485	60%	66.67	2	50%	33.33	1	44.33	1.33
39	Energy Engg (EE)	CH 486	60%	33.33	1	50%	33.33	1	33.33	1.00
40	EE Lab	CH 486L	60%	100	3	-	-	-	100	3.00
41	Fluid Flow Operation (FFO)	CH 487	60%	100	3	50%	66.67	2	77.67	2.33
42	FFO Lab	CH 487L	60%	100	3	-	-	-	100	3.00

43	GP	CH 488	60%	100	3	-	-	-	100	3.00
44	Economics & Principle of Management	HU 501	60%	100	3	50%	33.33	1	55.33	1.66
45	CRE I	CH 582	60%	66.67	2	50%	33.33	1	44.33	1.33
46	CRE Lab	CH582L	60%	100	3	-	-	-	100	3.00
47	MO	CH 583	60%	66.67	2	50%	33.33	1	44.33	1.33
48	MO Lab	CH 583L	60%	100	3	-	-	-	100	3.00
49	CET	CH 584	60%	66.67	2	50%	66.67	2	66.67	2.00
50	CET Lab	CH 584L	60%	100	3	-	-	-	100	3.00
51	Process Utilities	CH 585	60%	66.67	2	50%	100	3	89.0	2.67
52	PI	CH 586	60%	100	3	50%	66.67	2	77.67	2.33
53	PI Lab	CH 586L	60%	100	3	-	-	-	100	3.00
54	GP	CH 587	60%	100	3	-	-	-	100	3.00
55	CRE II	CH 681	60%	66.67	2	50%	33.33	1	44.33	1.33
56	PEEO	CH 682	60%	100	3	50%	100	3	100	3.00
57	MTO-I	CH 683	60%	100	3	50%	66.67	2	77.67	2.33
58	MTO Lab	CH 683L	60%	100	3	-	-	-	100	3.00
59	HTO	CH 684	60%	66.67	2	50%	33.33	1	44.33	1.33
60	HTO Lab	CH 684L	60%	100	3	-	-	-	100	3.00
61	PRP	CH 685	60%	100	3	50%	66.67	2	77.67	2.33
62	PRP Lab	CH 685L	60%	100	3	-	-	-	100	3.00
63	PDC	CH 686	60%	66.67	2	50%	100	3	89.0	2.67
64	PDC Lab	CH 686L	60%	100	3	-	-	-	100	3.00
65	GP	CH 687	60%	66.67	2	-	-	-	66.67	2.00
66	MTO II	CH 781	60%	66.67	2	50%	66.67	2	66.67	2.00
67	BCE	CH 782	60%	100	3	50%	66.67	2	81.0	2.43
68	PED	CH 783	60%	100	3	50%	66.67	2	81.0	2.43
69	EPCE	CH 784	60%	100	3	50%	100	3	100	3.00
70	PSE	CH 785	60%	100	3	50%	66.67	2	81.0	2.43
71	FE	CH 786	60%	100	3	50%	66.67	2	81.0	2.43
72	Factory Training	CH 787	60%	100	3	-	-	-	100	3.00
73	Project I	CH 788	60%	100	3	-	-	-	100	3.00
74	Transport Phenomena (TP)	CH 881	60%	66.67	2	50%	66.67	2	66.67	2.00
75	CPDD	CH 882	60%	100	3	50%	66.67	2	81.0	2.43

76	AST	CH 883	60%	100	3	50%	66.67	2	81.0	2.43
77	PPT	CH 884	60%	100	3	50%	66.67	2	81.0	2.43
78	AER	CH 885	60%	100	3	50%	66.67	2	81.0	2.43
79	Viva-Voce	CH 886	60%	66.67	2	-		-	81.0	2.43
80	Project II	CH 887	60%	100	3	-		-	66.67	2.00

Attainment of Program Outcomes (PO)and Program Specific Outcomes (PSO) (50)

Describe assessment tools and processes used for measuring the attainment of each of the Program Outcomes and Program Specific Outcomes (10)

• Describe the assessment tools and processes used to gather the data upon which the evaluation of each of the Program Outcomes and Program Specific Outcomes is based indicating the frequency with which these processes are carried out

• Describe the assessment processes that demonstrate the degree to which the Program Outcomes and Program Specific Outcomes are attained and document the attainment levels

The assessment tools and processes used to gather the data upon which the evaluation of each of the Program Outcomes and Program Specific Outcomes, indicating the frequency with which these processes are carried out is explained in Table 3.3.1

Table 3.3.1 The assessment tools, processes and frequency of processes

Method	Assessment Tools	Process	Frequency
Direct	Tests	1) Data collected as given in 3.2.1.	1) Class tests are taken twice/thrice every semester.
	Assignments		
	Practicals		
	Semester Examination	2) CO attainment contribution to PO attainment is calculated for every subject	2)Assignments are given every semester
	Presentation/Seminar Case study Project evaluation	Student performance is calculated as per the rubrics fixed and is used to calculate	As per requirement of the course

	Viva voce	CO attainment.	
Indirect	Student exit survey Alumni survey	Feedback forms are customized to an average marking as per levels 1, 2 & 3	On completion of every semester. Every year

PO attainment level will be based on attainment levels of direct assessment and indirect assessment.

The overall CO attainment values for all courses as computed in Section 3.2.2 and the CO-PO mapping values as computed in Section 3.1.3 are used to compute the attainment of each PO for all courses. Similarly, the overall CO attainment value as computed in Section 3.2.2 and CO-PSO mapping values as computed in Section 3.1.3 are used to compute the attainment of PSOs.

Sample computation of PO values:
Suppose, overall CO attainment for a particular course CH881 = 2 (Table 3.2.2)
      & PO1 for course CH881 = 3 (obtained from Table 3.1.3)
      Then, PO1 attainment value for course CH881 = (2*3)/3 = 2

- ➢ CO attainment contribution to PO attainment is calculated for every course.
- ➢ Direct attainment level of a PO & PSO is determined by taking average across all courses addressing that PO and/or PSO.
- ➢ Indirect attainment level of PO & PSO is determined based on mainly the outgoing students' feedback regarding the program.
- ➢ 90% weightage is given to direct attainment and 10% weightage to indirect attainment.
- ➢ Overall PO attainment is calculated using the set weightages of direct and indirect attainment.

Provide results of evaluation of each PO & PSO (40)

Table 3.3.2.A: PO Attainment; Curriculum 2013-2017

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PH101	1.67	1.33	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PH101L	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00

CH102	2.02	1.24	0.00	0.00	0.00	0.31	0.47	0.00	0.00	0.00	0.00	0.47
CH102L	2.50	1.75	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
MA103	1.66	1.66	0.66	0.11	0.00	0.00	0.00	0.00	0.11	0.00	0.00	1.11
CE104	0.86	0.73	0.07	0.26	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HU105	0.00	0.78	0.00	0.78	0.00	0.78	0.78	1.03	2.33	1.75	0.00	2.33
CE106	1.66	1.66	1.57	1.42	1.18	1.42	0.55	0.00	0.00	0.00	0.00	0.00
CS107	1.78	2.07	2.67	1.18	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ME 108	1.80	1.40	0.00	0.00	0.00	0.00	0.00	1.20	1.80	0.00	0.00	0.00
PH201	0.58	0.44	0.42	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PH201L	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00
CH202	1.24	0.98	0.35	0.00	0.00	0.27	0.27	0.00	0.44	0.44	0.00	0.44
CH202L	2.00	2.00	0.00	1.25	0.00	0.50	1.00	0.00	0.00	1.00	0.00	0.00
MA 203	1.66	1.66	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11
CE 204	0.99	0.74	0.50	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CE 204L	3.00	2.00	0.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EE 205	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EE 205L	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ME 207	2.33	2.33	1.30	0.00	1.55	2.33	0.00	0.00	0.00	0.00	0.00	0.78
ME 208	1.60	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.60	0.00	0.00	0.00
MA 301	0.99	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66
ME 302	2.33	1.55	2.02	1.09	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.78
ME302L	2.00	1.80	2.30	1.80	1.30	0.00	0.00	0.00	0.00	0.00	0.00	1.00
EE 303	1.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60
EE 303L	3.00	1.66	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	1.66
CH 384	1.55	1.00	1.11	1.11	0.77	0.66	0.55	0.44	0.00	0.00	0.00	0.55
CH 385	1.55	1.40	1.24	1.24	0.78	1.55	2.02	0.78	0.00	0.78	0.00	1.55
CH 385L	2.00	0.00	0.00	2.00	0.00	1.00	0.00	1.00	3.00	1.00	0.00	1.00
CH 386	0.77	0.33	0.44	0.44	0.00	0.66	0.44	0.44	0.00	0.55	0.00	0.66
CH 387	2.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.00	1.00	0.00	1.00
CH 388	2.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	2.00	0.00	1.00
MA 411	1.33	1.06	0.71	0.44	0.44	0.00	0.00	0.00	0.44	0.00	0.00	0.62
HU 402	0.00	0.44	0.00	0.00	0.00	0.59	0.44	0.59	0.51	0.44	0.44	1.33
HU 403	0.00	1.00	0.00	0.83	0.00	1.22	0.66	1.00	1.11	1.66	0.00	1.66
EE 404	2.00	1.33	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.93
EE 404L	3.00	1.75	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.50	0.00	1.50
CH 485	1.33	0.71	0.71	0.62	0.27	0.18	0.27	0.09	0.18	0.35	0.18	0.53

CH 486	1.00	0.80	0.40	0.53	0.53	0.53	0.40	0.47	0.00	0.00	0.00	0.60
CH486 L	1.00	0.00	0.00	1.60	0.00	0.80	0.00	0.80	1.80	1.00	0.00	1.00
CH 487	1.71	1.09	1.09	0.78	0.78	0.62	0.78	0.47	0.00	0.00	0.47	0.78
CH487 L	2.00	0.00	0.00	3.00	0.00	1.00	0.00	2.00	2.00	1.00	0.00	1.00
CH 488	2.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	2.00	2.00	0.00	1.00
HU 501	0.00	0.55	0.00	0.00	0.00	0.83	0.55	0.83	1.11	0.55	0.55	1.47
CH 582	0.89	0.89	0.89	0.89	0.71	0.44	0.71	0.44	0.00	0.00	0.27	0.44
CH582L	1.33	0.00	0.00	2.00	0.00	0.00	0.00	1.00	2.00	1.00	0.00	1.00
CH 583	1.15	0.98	0.62	0.62	0.62	0.27	0.35	0.18	0.00	0.00	0.00	0.44
CH 583L	2.00	0.20	0.20	2.00	0.00	1.00	0.00	1.00	2.00	1.00	0.00	1.00
CH 584	2.00	1.60	1.07	0.80	0.93	0.00	0.00	0.67	0.00	0.00	0.00	1.33
CH584L	1.67	0.00	0.00	2.00	0.00	0.33	0.00	1.00	1.67	1.00	0.00	1.00
CH 585	1.96	1.60	1.42	1.42	0.89	1.25	1.78	0.89	0.00	0.00	0.00	1.42
CH 586	2.33	2.02	1.40	1.55	1.09	0.78	0.78	0.47	0.00	0.78	0.00	1.09
CH 586L	2.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	2.00	1.00	0.00	1.00
CH 587	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	2.00	3.00	0.00	1.00
CH 681	1.33	1.24	1.15	1.33	0.89	0.80	0.62	0.44	0.00	0.00	0.35	0.89
CH 682	3.00	2.40	2.40	1.60	2.00	1.60	1.20	2.20	0.80	1.20	2.60	2.00
CH 683	2.33	2.02	1.40	1.40	1.09	0.00	1.09	0.31	0.00	0.62	0.00	1.55
CH 683L	2.00	0.00	0.00	2.00	0.00	1.00	0.00	1.00	2.00	1.00	0.00	1.00
CH 684	0.80	1.15	0.62	0.80	0.89	0.44	0.98	0.27	0.00	0.00	0.27	0.44
CH 684L	2.00	2.00	0.00	2.00	0.00	1.00	0.00	1.00	2.00	1.00	0.00	2.00
CH 685	1.86	1.55	1.55	1.40	0.78	1.09	1.09	0.62	0.78	1.09	0.00	1.86
CH 685L	2.00	0.00	0.00	2.00	0.00	2.00	1.00	1.00	2.00	1.00	0.00	1.00
CH 686	2.67	2.67	1.78	1.78	1.96	1.07	0.00	0.89	0.00	0.00	0.00	1.42
CH 686L	2.00	1.25	0.00	2.00	0.60	1.00	0.00	1.00	2.00	1.00	0.00	1.00
CH 687	1.33	0.00	0.00	0.00	0.00	0.67	0.00	0.67	1.33	2.00	0.00	0.67
CH 781	1.73	1.73	1.60	1.47	0.93	0.00	0.40	0.40	0.67	0.80	0.00	0.93
CH 782	1.94	1.62	1.46	0.97	1.13	0.97	1.62	0.32	0.00	0.00	0.00	0.81
CH 783	2.43	1.30	1.78	1.78	0.97	1.62	1.46	1.30	0.00	0.00	0.97	1.30
CH 784	2.80	2.20	1.20	1.20	1.20	1.60	3.00	1.40	0.00	0.00	0.00	1.20
CH 785	1.78	1.78	1.78	1.13	1.46	1.62	1.62	1.46	0.00	0.00	0.00	1.62
CH 786	1.94	1.78	0.97	1.30	0.00	0.49	0.00	0.16	0.00	0.00	0.00	0.97
CH 787	3.00	3.00	2.00	1.00	3.00	2.00	2.00	2.00	2.00	3.00	1.00	3.00
CH 788	3.00	3.00	3.00	3.00	2.00	1.00	2.00	2.00	3.00	2.00	2.00	2.00
CH 881	2.00	1.60	1.07	1.33	1.20	0.67	0.67	0.67	0.00	0.00	0.27	1.07

CH 882	2.43	2.03	2.43	1.82	0.81	1.01	1.22	1.01	0.00	0.00	0.81	0.81
CH 883	2.43	2.11	1.30	0.49	0.97	1.13	0.97	0.81	0.00	0.00	0.00	0.97
CH 884	1.46	1.13	0.97	0.97	0.65	0.81	0.81	0.16	0.00	0.00	0.00	1.46
CH 885	1.94	0.97	1.13	0.65	0.32	1.62	2.43	0.65	0.00	0.00	0.16	2.43
CH 887	2.00	2.00	1.33	0.67	0.67	0.00	0.00	1.33	2.00	2.00	0.00	2.00
Direct Attainment X	**1.82**	**1.46**	**1.25**	**1.26**	**1.07**	**0.97**	**1.03**	**0.88**	**1.48**	**1.15**	**0.74**	**1.14**
Indirect Attainment Y	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**	**2.50**
Overall PO Attainment =0.9*X+0.1*Y	**1.89**	**1.56**	**1.37**	**1.38**	**1.21**	**1.12**	**1.17**	**1.05**	**1.58**	**1.28**	**0.91**	**1.28**

PSO attainment is recorded in similar manner in Table 3.3.2.B

Table 3.3.2.B: PSO Attainment; Curriculum 2013-2017

Course	PSO1	PSO2	PSO3
PH101	0.53	0.67	0.00
PH101L	0.33	0.67	0.00
CH102	0.78	0.47	0.00
CH102L	0.75	1.00	0.00
MA103	0.00	1.66	0.00
CE104	0.00	0.00	0.00
HU105	0.00	0.00	0.00
CE106	0.15	0.77	0.00
CS107	0.53	1.78	0.29
ME 108	0.60	0.00	0.00
PH201	0.08	0.42	0.00
PH201L	0.67	1.33	0.00
CH202	0.53	0.27	0.00
CH202L	1.00	0.80	3.00
MA 203	0.00	1.66	0.00
CE 204	0.00	0.33	0.00
CE 204L	0.00	1.00	0.00
EE 205	0.00	0.00	0.00
EE 205L	0.00	0.00	0.00

ME 207	0.62	0.00	0.00
ME 208	0.40	0.00	0.00
MA 301	0.00	0.99	0.00
ME 302	2.17	2.33	0.78
ME302L	2.00	2.00	1.00
EE 303	0.00	0.13	0.00
EE 303L	0.00	0.67	0.00
CH 384	0.55	0.66	0.00
CH 385	1.40	0.00	0.31
CH 385L	2.00	0.00	0.00
CH 386	0.22	0.22	0.00
CH 387	1.00	1.00	0.00
CH 388	0.00	0.00	0.00
MA 411	0.00	1.33	0.00
HU 402	0.00	0.00	0.00
HU 403	0.00	0.00	0.00
EE 404	0.00	0.27	0.00
EE 404L	0.00	0.50	0.00
CH 485	0.53	0.44	0.00
CH 486	0.40	0.13	0.00
CH486 L	1.20	1.50	1.00
CH 487	1.09	0.47	0.00
CH487 L	2.00	1.00	0.00
CH 488	0.00	0.00	0.00
HU 501	0.00	0.00	0.00
CH 582	1.33	0.44	0.00
CH582L	2.00	1.50	0.00
CH 583	0.89	0.00	0.00
CH 583L	1.80	1.00	0.00
CH 584	0.80	0.80	0.00
CH584L	2.00	1.00	0.00
CH 585	1.78	0.00	0.00
CH 586	0.78	0.47	0.00
CH 586L	1.00	0.00	0.00
CH 587	0.00	0.00	0.00
CH 681	0.71	0.89	0.00

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CH 682	0.40	0.00	2.20
CH 683	1.40	1.24	0.00
CH 683L	2.00	1.00	0.00
CH 684	0.53	0.35	0.00
CH 684L	2.00	1.33	0.00
CH 685	2.33	0.31	0.00
CH 685L	3.00	0.00	0.00
CH 686	1.42	1.07	0.00
CH 686L	1.00	1.00	0.00
CH 687	0.00	0.00	0.00
CH 781	2.00	1.33	0.00
CH 782	0.97	0.32	0.00
CH 783	1.46	1.30	0.00
CH 784	1.80	0.80	0.20
CH 785	1.13	0.32	0.81
CH 786	1.78	0.16	0.00
CH 787	0.00	3.00	1.00
CH 788	1.00	3.00	1.00
CH 881	0.80	1.33	0.00
CH 882	2.03	1.62	0.00
CH 883	1.46	0.65	0.32
CH 884	2.27	0.97	0.00
CH 885	0.97	0.32	0.32
CH 887	1.33	2.00	0.67
Direct Attainment, X	**1.19**	**0.97**	**0.92**
Indirect Attainment, Y	**2.5**	**2.5**	**2.5**
Overall PSO Attainment =0.9*X+0.1*Y	**1.49**	**1.33**	**1.00**
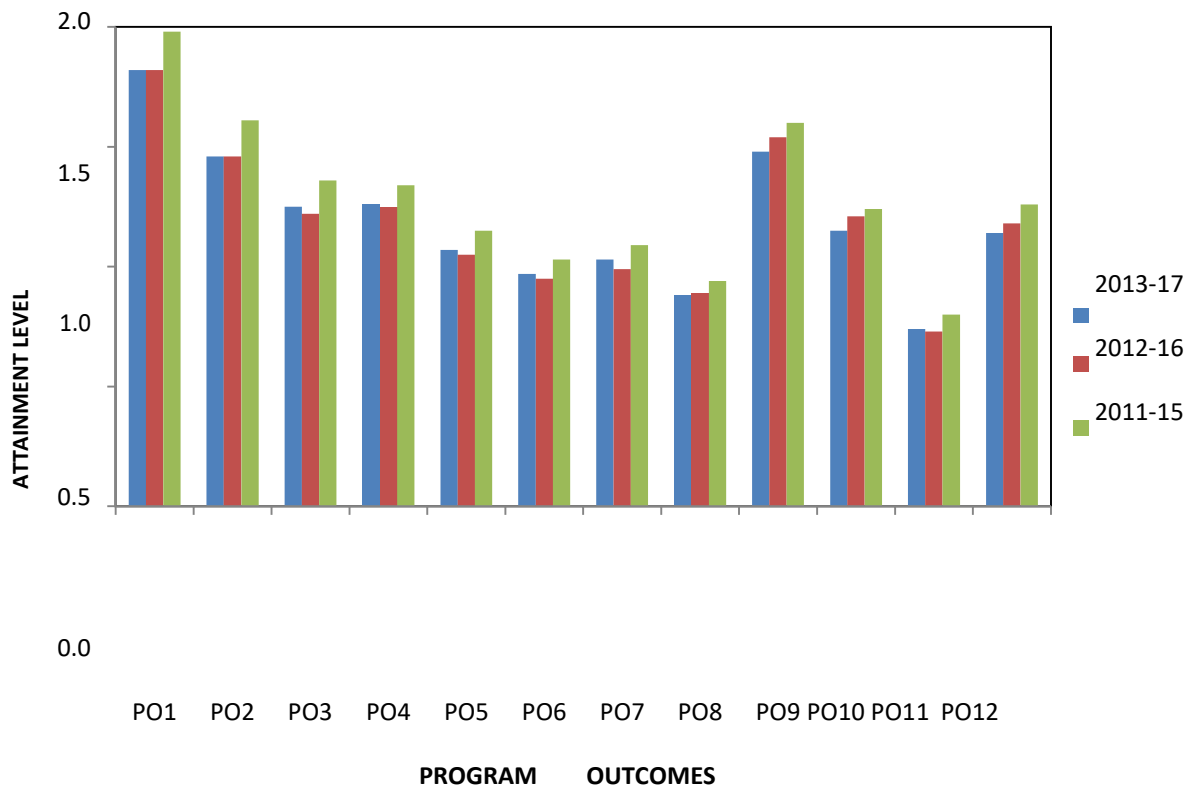
Fig. 3.1 PO ATTAINMENT BY DIRECT METHOD
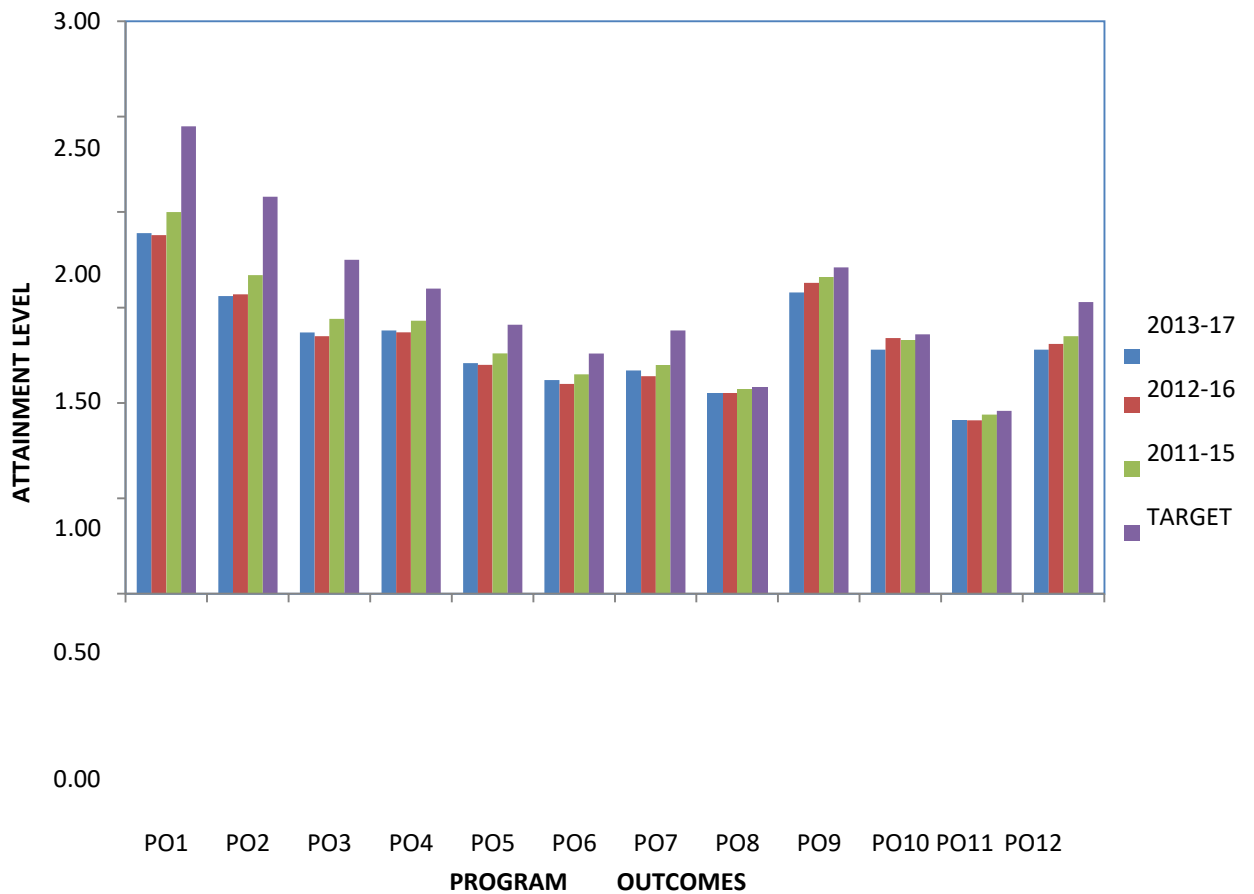
Fig. 3.2 COMPARISON OF OVERALL PO ATTAINMENT FOR CAY, CAYm1, CAYm2 WITH TARGET VALUES
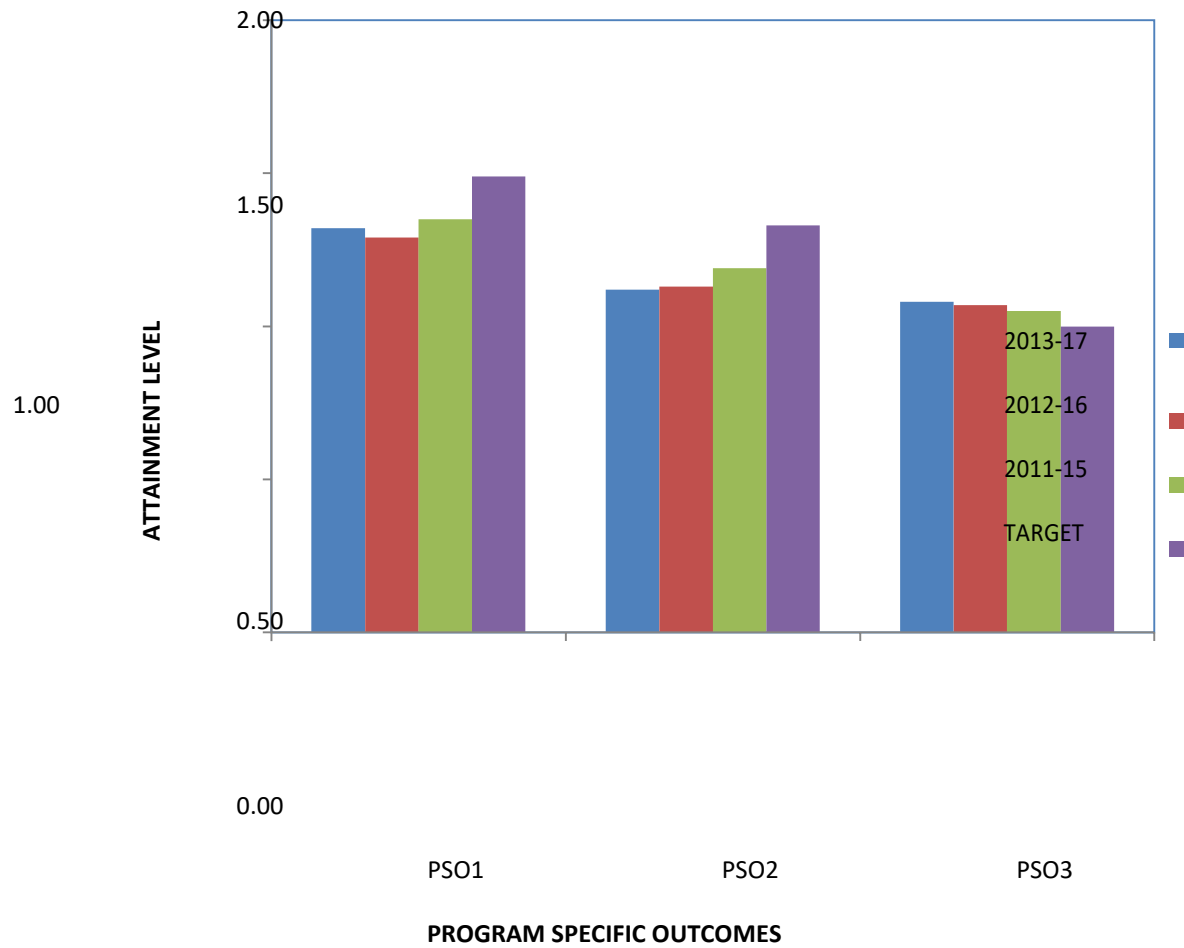
Fig. 3.3 COMPARISON OF OVERALL PSO ATTAINMENT FOR CAY, CAYm1, CAYm2 WITH TARGET VALUES