



RVS COLLEGE OF ENGINEERING AND TECHNOLOGY

KumaranKottam Campus, Kannampalayam (Po), Coimbatore – 641 402
(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)
NAAC Accredited and ISO 21001:2018 certified Institution



Criterion 2- Teaching- Learning and Evaluation

2.6 Student Performance and Learning Outcome

2.6.2- Attainment of Programme outcomes, Programme specific outcomes and course outcomes are evaluated by the institution

Academic Year 2022-2023

COURSE OUTCOME ATTAINMENT

The attainment of Course Outcomes (COs) can be calculated with the help of performance in Internal Test, Model Examination, Assignments, Seminars, Course End Semester University examination and Course Exit Survey. The course attainment assessment methods are shown in figure 1.

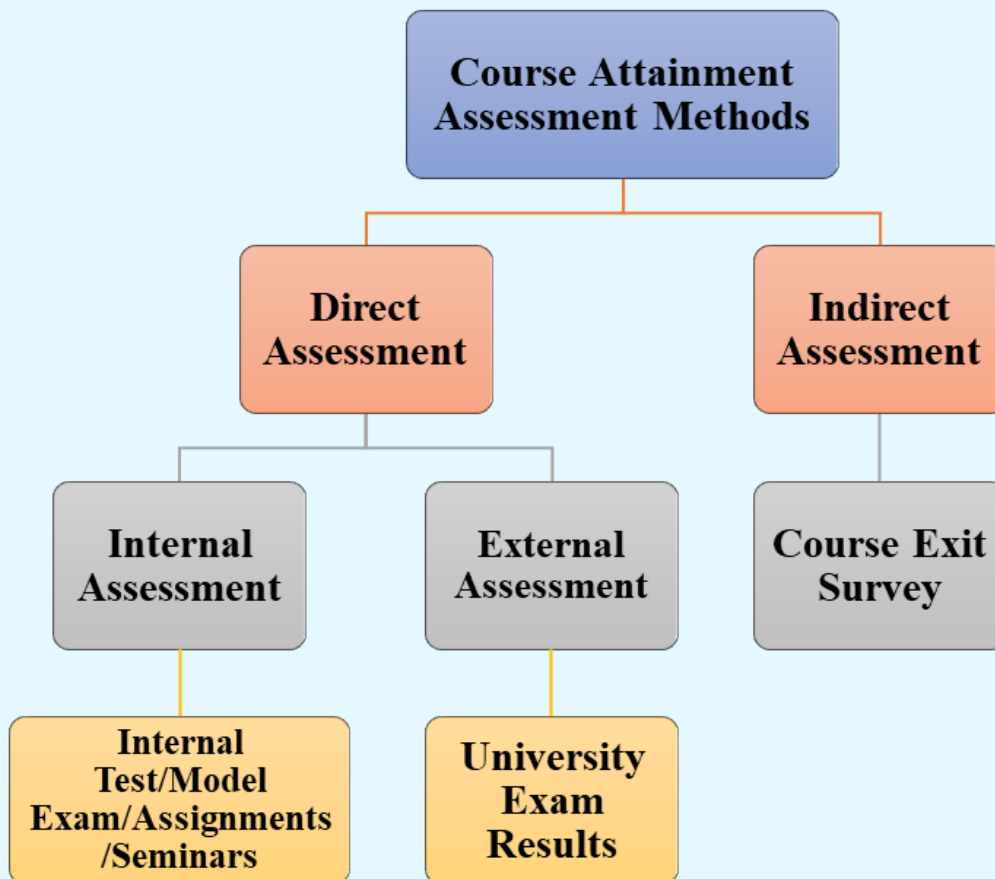


Figure 1 Course Attainment Assessment Methods

Total CO Attainment = 80 % of Direct Assessment + 20% of Indirect Assessment



DIRECT ASSESSMENT:

Direct attainment is calculated from the performance of students in internal assessments and external assessments.

Direct attainment = 60% of Internal Assessment + 40% of External Assessment

• **Internal Assessments (Weightage: 60%)**

Internal tests, Model examinations are conducted as per the academic calendar and the assignments, seminars are also given for the students. The course outcomes of the respective courses are evaluated based on the performance of the students.

The course outcome target attainment levels are fixed based on the nature of the particular course before the commencement of the course by the course handling faculty and it is reviewed by IQAC.

Course outcome attainment level is measured in terms of the percentage of students getting the predefined Benchmark value set for the individual course in the internal assessments.

Benchmark Value for Internal Assessments

Benchmark value	Benchmark value	
	For Assignments/ Tutorial/ Seminar	For Internals/Model Exams / Projects / Laboratory
	70 Marks	60 Marks

Level of Attainment for Internal Assessments

Level of Attainment	% of Students Scored the Benchmark value	
	For Assignments/ Tutorial/ Seminar	For Internals/Model Exams / Projects / Laboratory
Level 1	70 to 80	55 to 65
Level 2	81 to 90	66 to 75
Level 3	91 to 100	76 to 100



- External Assessments (Weightage: 40%)**

Course outcome attainment level is measured in terms of the percentage of students getting grades better than the target grade fixed for the individual course in the University Examinations.

Benchmark Value for External Assessments

Benchmark value	Benchmark value for University exam
	B Grade

Level of Attainment for External Assessments

Level of Attainment	% of Students Scored the Benchmark value in University exam
Level 1	55 to 65
Level 2	66 to 75
Level 3	76 to 100

INDIRECT ASSESSMENT:

Course exit survey is conducted at the end of every semester. The survey feedbacks are consolidated and the COs are calculated.

Course Outcome Attainment Levels

Assessment Method	Assessment Tool	Level of Attainment			
		Level 1	Level 2	Level 3	
Direct Assessment	Internal Assessment	Internal / Model Examinations	55% to 65% of students scored more than the benchmark value of 60 marks	66% to 75% of students scored more than the benchmark value of 60 marks	At least 76% of students scored more than the benchmark value of 60 marks
		Assignments / Tutorial / Seminar	70% to 80% of students scored more than the benchmark value of 60 marks	81% to 90% of students scored more than the benchmark value of 60 marks	At least 91% of students scored more than the benchmark value of 60 marks
		Project	55% to 65% of students scored more than the benchmark value of 60 marks	66% to 75% of students scored more than the benchmark value of 60 marks	At least 76% of students scored more than the benchmark value of 60 marks
		Laboratory	55% to 65% of students scored more than the benchmark value of 60 marks	66% to 75% of students scored more than the benchmark value of 60 marks	At least 76% of students scored more than the benchmark value of 60 marks
	External Assessment	University Examination	55% to 65% of students scored more than the benchmark value of 60 marks	66% to 75% of students scored more than the benchmark value of 60 marks	At least 76% of students scored more than the benchmark value of 60 marks
Indirect Assessment	Course Exit Survey	Average value of course exit survey of all the students			

Course Attainment formuals

Internal Attainment

Internal Attainment	Internal Examination (IE)	Model Examination (ME)	Assignment (A)	Seminar (S)	Tutorial (T)	Formual (Weightage)
	✓	✓	✓			$0.6*IE + 0.1*ME + 0.3*A$
	✓	✓	✓	✓		$0.6*IE + 0.1*ME + 0.15*A + 0.15*S$
	✓	✓	✓		✓	$0.6*IE + 0.1*ME + 0.15*A + 0.15*T$
	✓	✓		✓		$0.6*IE + 0.1*ME + 0.3*S$
	✓	✓		✓	✓	$0.6*IE + 0.1*ME + 0.15*S + 0.15*T$
	✓	✓			✓	$0.6*IE + 0.1*ME + 0.3*T$
	✓	✓				$0.7*IE + 0.3*ME$
✓	✓	✓	✓	✓	$0.6*IE + 0.1*ME + 0.1*A + 0.1*S + 0.1*T$	

Total Direct Attainment = $0.6*Internal\ Attainment + 0.4*External\ Attainment$

Total Course Outcome Attainment = $0.8*Total\ Direct\ Attainment + 0.2$

*Indirect Attainment

Total CO Attainment

Table 3

Internal Attainment	Internal Examination (IE)	Model Examination (ME)	Assignment (A)	Seminar (S)	Tutorial (T)	Formual (Weightage)
	✓	✓	✓			$0.6*IE + 0.1*ME + 0.3*A$
	✓	✓	✓	✓		$0.6*IE + 0.1*ME + 0.15*A + 0.15*S$
	✓	✓	✓		✓	$0.6*IE + 0.1*ME + 0.15*A + 0.15*T$
	✓	✓		✓		$0.6*IE + 0.1*ME + 0.3*S$
	✓	✓		✓	✓	$0.6*IE + 0.1*ME + 0.15*S + 0.15*T$
	✓	✓			✓	$0.6*IE + 0.1*ME + 0.3*T$
	✓	✓				$0.7*IE + 0.3*ME$
✓	✓	✓	✓	✓	$0.6*IE + 0.1*ME + 0.1*A + 0.1*S + 0.1*T$	

PO, PSO Attainment

POs and PSOs are evaluated by direct and indirect assessment methods. The following methods of assessment are identified

- **Direct Assessments (Weightage: 80%)**

At the end of every semester, the Course Outcome attainments for all the courses undergone by a particular batch of students will be calculated as described above and is tabulated to analyze the contribution of those courses for the Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) attainment. At the end of the programme, after all the courses are completed, PO and PSO attainment levels for a particular batch are obtained.

- **Indirect Assessments (Weightage: 20%)**

At the end of the programme, an exit survey is taken from all the students. The survey feedbacks are consolidated and the Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) are calculated.

Through the above mentioned methods, the attainment of CO, PO and PSOs are calculated. In case of the attainment falls sort of the target level, the IQAC takes remedial measures to improve the next academic year.

$$\text{PO, PSO Attainment} = 80 \% \text{ of Direct Assessment} + 20\% \text{ Indirect Assessment}$$

PO-PSO Attainment Calculations

Direct PO-PSO Attainment from Course Outcome Attainment

From Table 1

Cos	Pos												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	a1	..	..	..	..	..	..	..	..	..	..	..	x1	..	..
CO2	a2	..	..	..	..	..	..	..	..	..	..	..	x2	..	..
CO3	a3	..	..	..	..	..	..	..	..	..	..	..	x3	..	..
CO4	a4	..	..	..	..	..	..	..	..	..	..	..	x4	..	..
CO5	a5	..	..	..	..	..	..	..	..	..	..	..	x5	..	..
Avg Mapping	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Direct PO-PSO Attainment - Table 4

Cos	Pos												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	(TCA1/3)*a1	..	..	..	..	..	..	..	..	..	..	..	(TCA1/3)*x1	..	..
CO2	(TCA2/3)*a2	..	..	..	..	..	..	..	..	..	..	..	(TCA2/3)*x2	..	..
CO3	(TCA3/3)*a3	..	..	..	..	..	..	..	..	..	..	..	(TCA3/3)*x3	..	..
CO4	(TCA4/3)*a4	..	..	..	..	..	..	..	..	..	..	..	(TCA4/3)*x4	..	..
CO5	(TCA5/3)*a5	..	..	..	..	..	..	..	..	..	..	..	(TCA5/3)*x5	..	..
Avg Mapping	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
CO-PO-PSO Attainment	Average of CO1 to CO5	..	..	..	..	..	..	..	..	..	..	..	Average of CO1 to CO5	..	..

***TCA – calculated from table 3**

Direct PO, PSO Attainment Formulas

$$\text{Direct CO-PO Attainment} = \frac{((TCA1/3)*a1 + (TCA2/3)*a2 + (TCA3/3)*a3 + (TCA4/3)*a4 + (TCA5/3)*a5)}{5}$$

$$\text{Direct CO-PSO Attainment} = \frac{((TCA1/3)*x1 + (TCA2/3)*x2 + (TCA3/3)*x3 + (TCA4/3)*x4 + (TCA5/3)*x5)}{5}$$

Total PO, PSO Attainment Formulas

PO, PSO Attainment = 80 % of Direct Assessment + 20% Indirect Assessment



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Programme Level CO-PO-PSO mapping

SI - N O	SUBJECT CODE	NAME OF THE COURSE	COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3
1	HS8151	Communicative English	C101	2.00	-	-	-	-	-	2.00	-	-	-	-	2.60	-	2.00	-
2	MA8151	Engineering Mathematics - I	C102	2.00	-	-	-	-	-	2.00	-	-	-	-	2.60	-	2.00	-
3	PH8151	Engineering Physics	C103	-	-	-	-	-	-	2.00	2.80	-	2.00	-	-	-	-	-
4	CY8151	Engineering Chemistry	C104	3.00	-	-	-	3.00	1.00	1.00	3.00	-	-	-	3.00	-	3.00	-
5	GE8151	Problem Solving and Python Programming	C105	-	-	-	-	-	-	2.00	2.80	-	2.00	-	-	-	-	-
6	GE8152	Engineering Graphics	C106	-	-	2.00	-	-	-	-	-	-	-	1.00	2.00	-	-	-
7	GE8161	Problem Solving and Python Programming Laboratory	C107	-	-	-	-	-	-	1.20	2.80	-	2.00	-	-	-	-	-
8	BS8161	Physics and Chemistry Laboratory	C108	2.60	-	-	-	2.80	-	2.00	-	-	-	-	-	-	2.60	-
9	HS8251	Technical English	C109	-	2.00	-	-	1.00	-	-	-	-	-	2.00	1.00	-	-	2.00
10	MA8251	Engineering Mathematics - II	C110	2.00	-	2.00	-	2.00	1.00	2.00	-	-	-	-	-	-	2.00	-
11	PH8252	Physics for Information Science	C111	2.00	-	-	-	-	-	2.00	-	-	-	-	2.60	-	2.00	-
12	BE8255	Basic Electrical, Electronics and Measurement Engineering	C112	2.00	-	-	-	-	-	2.00	-	-	-	-	2.60	-	2.00	-

13	GE8291	Environmental Science and Engineering	C113	2.00	-	-	-	-	-	2.00	-	-	-	-	2.60	-	2.00	-
14	CS8251	Programming in C	C114	2.80	3.00	2.60	-	-	-	2.80	-	2.00	-	2.00	-	-	2.00	-
15	GE8261	Engineering Practices Laboratory	C115	3.00	2.00	-	-	-	-	-	1.00	1.00	2.00	-	-	-	1.00	-
16	CS8261	C Programming Laboratory	C116	3.00	2.00	-	-	1.00	-	-	2	1	2	-	-	-	-	-
17	MA8351	Discrete Mathematics	C201	3.00	3.00	2.00	-	-	-	-	3.00	2.00	-	-	-	-	-	-
18	CS8351	Digital Principles and System Design	C202	3.00	1.80	1.20	1.20	-	-	2.00	-	-	2.00	-	-	-	2.00	-
19	CS8391	Data Structures	C203	2.40	1.40	-	1.40	-	-	-	-	2.00	2.00	2.00	-	-	2.20	-
20	CS8392	Object Oriented Programming	C204	3.00	-	2.00	2.00	2.00	1.00	-	2.00	1.00	-	-	-	-	2.00	-
21	EC8395	Communication Engineering	C205	3.00	3.00	3.00	3.00	2.00	-	3.00	-	-	-	-	3.00	3.00	1.80	2.00
22	CS8381	Data Structures Laboratory	C206	2.00	0.00	3.00	3.00	2.00	2.00	0.00	3.00	3.00	0.00	0.00	0.00	0.00	3.00	0.00
23	CS8383	Object Oriented Programming Laboratory	C207	1.00	2.00	2.00	2.00	1.60	1.00	-	1.00	1.00	2.00	-	1.00	1.60	1.00	-
24	CS8382	Digital Systems Laboratory	C208	3.00	2.00	2.00	2.00	-	-	-	-	-	-	-	-	-	2.00	-
25	HS8381	Interpersonal Skills/Listening & Speaking	C209	1.00	1.60	-	-	-	-	-	-	1.20	2.80	-	2.00	-	-	-
26	MA8402	Probability and Queueing Theory	C210	3.00	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-
27	CS8491	Computer Architecture	C211	2.20	1.00	-	3.00	2.00	-	-	-	-	-	-	-	-	2.00	-
28	CS8492	Database Management Systems	C212	3.00	-	2.00	2.00	2.00	-	-	-	2.00	-	-	1.00	-	2.00	-



Programme Level CO-PO-PSO mapping

29	CS8451	Design and Analysis of Algorithms	C213	3.00	1.00	3.00	1.00	-	-	-	-	-	-	-	2.00	2.00	1.00	2.00
30	CS8493	Operating Systems	C214	2.20	2.00	1.00	1.00	-	-	-	-	-	-	-	-	2.00	2.00	-
31	CS8494	Software Engineering	C215	2.40	1.40	1.00	-	1.80	-	-	-	-	-	-	-	-	1.00	-
32	CS8481	Database Management Systems Laboratory	C216	2.00	2.00	3.00	3.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00	3.00	0.00
33	CS8461	Operating Systems Laboratory	C217	3.00	2.00	-	-	3.00	1.00	1.00	-	-	-	-	-	-	3.00	-
34	HS8461	Advanced Reading and Writing	C218	2.00	2.00	3.00	3.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	MA8551	Algebra and Number Theory	C301	3.00	2.00	1.00	1.00	2.00	2.00	1.40	-	1.40	-	1.40	1.40	-	2.00	-
36	CS8591	Computer Networks	C302	-	3	-	3	-	-	2	-	2	2	2	2	-	3	-
37	EC8691	Microprocessors and Microcontrollers	C303	2.40	1.40	1.60	1.20	-	1.40	-	1.60	1.20	2.00	0.80	-	-	2.20	-
38	CS8501	Theory of Computation	C304	2.20	1.60	1.20	-	1.20	-	-	-	-	1.00	-	1.00	2.00	-	-
39	CS8592	Object Oriented Analysis and Design	C305	1.40	-	2.00	-	2.00	-	2.60	-	1.20	-	-	-	2.00	2.40	-
40	OCE551	Air Pollution and Control Engineering	C306	1.40	2.00	1.20	-	1.20	-	-	-	-	1.00	-	1.00	2.00	-	-
41	EC8681	Microprocessors and Microcontrollers Laboratory	C307	2.8	1.8	3	-	2.8	1	1	-	-	-	-	-	-	3	-
42	CS8582	Object Oriented Analysis and Design Laboratory	C308	3.00	2.00	2.00	1.00	1.00	-	-	-	-	2.00	1.00	1.00	1.60	1.00	-
43	CS8581	Networks Laboratory	C309	-	2.00	2.00	-	-	-	3.00	3.00	-	-	-	-	-	2.00	-

44	CS8651	Internet Programming	C310	2.00	-	2.00	2.00	2.00	1.00	-	2.00	1.00	-	-	-	-	2.00	-
45	CS8691	Artificial Intelligence	C311	2.20	1.20	-	-	-	-	-	-	-	-	-	-	-	1.20	-
46	CS8601	Mobile Computing	C312	2.40	1.40	1.00	-	-	-	-	-	-	2.00	2.00	-	2.00	-	-
47	CS8602	Compiler Design	C313	2.80	2.60	1.80	-	-	-	-	-	2.00	-	-	-	1.80	2.80	-
48	CS8603	Distributed Systems	C314	3.00	2.00	2.00	1.00	-	1.00	1.00	-	1.00	-	-	1.20	-	3.00	-
49	IT8076	Software Testing	C315	3.00	2.40	3.00	2.00	2.40	1.80	-	1.00	2.20	2.00	2.00	2.20	2.00	1.80	-
50	CS8661	Internet Programming Laboratory	C316	3.00	2.40	3.00	2.00	2.40	1.80	-	1.00	2.20	2.00	2.00	2.20	2.00	1.80	-
51	CS8662	Mobile Application Development Laboratory	C317	1.00	1.33	-	-	-	-	-	-	1.20	2.80	-	2.00	-	-	-
52	CS8611	Mini Project	C318	3.00	2.00	3.00	1.00	-	-	1.60	-	-	-	-	1.40	-	3.00	-
53	HS8581	Professional Communication	C319	1.00	3.00	2.00	-	-	-	-	-	-	-	-	-	-	2.00	-
54	MG8591	Principles of Management	C401	2.20	1.60	1.00	-	-	-	-	-	-	2.00	-	-	1.00	2.00	-
55	CS8792	Cryptography and Network Security	C402	2.20	1.60	1.00	-	-	1.00	2.00	-	-	2.00	-	-	1.00	2.00	-
56	CS8791	Cloud Computing	C403	-	-	-	-	-	3.00	3.00	3.00	3.00	-	3.00	3.00	-	1.00	1.00
57	OCY751	Waste Water Treatment	C404	2.00	1.00	-	-	1.00	-	-	-	-	-	-	-	1.00	2.00	-
58	IT8075/ CS8088	Software Project Management/ Wireless Adhoc Sensor Networks	C405	3.00	-	-	-	2.00	-	-	-	-	1.00	-	-	3.00	1.00	-
59	CS8079	Human Computer Interaction	C406	2.00	2.00	2.00	-	1.00	-	-	-	-	-	-	1.00	1.00	2.00	-
60	CS8711	Cloud Computing Laboratory	C407	2.20	1.60	1.20	-	1.20	-	-	-	-	1.00	-	1.00	2.00	-	-

Programme Level CO-PO-PSO mapping

61	IT8761	Security Laboratory	C408	3.00	1.00		1.00	1.00	3.00	1.00	3.00	2.00	1.00	1.00	2.00	-	-	3.00
62	GE8076	Professional Ethics in Engineering	C409	-	1.00	-	-	-	2.00	2.00	2.00	2.00	2.00	2.00	2.00	-	-	2.00
64	CS8811	Project Work	C411	3.00	3.00	1.00	3.00	3.00	3.00	-	3.00	-	3.00	-	-	2.00	1.00	1.00
DA-Direct PO, PSO Attainment (for 3)				137.60	105.43	85.00	47.80	47.60	27.00	38.20	37.60	58.60	53.80	21.20	43.40	38.00	92.00	12.00
IA-Indirect PO, PSO Attainment (for 3)				7.00	8.00	19.00	37.00	34.00	44.00	39.00	43.00	27.00	34.00	46.00	35.00	38.00	15.00	52.00
Total PO, PSO Attainment (for 3) (0.8*DA+0.2*IA)				2.46	1.92	1.93	1.84	1.64	1.42	1.59	1.88	1.63	1.86	1.25	1.55	1.52	1.92	1.09

