

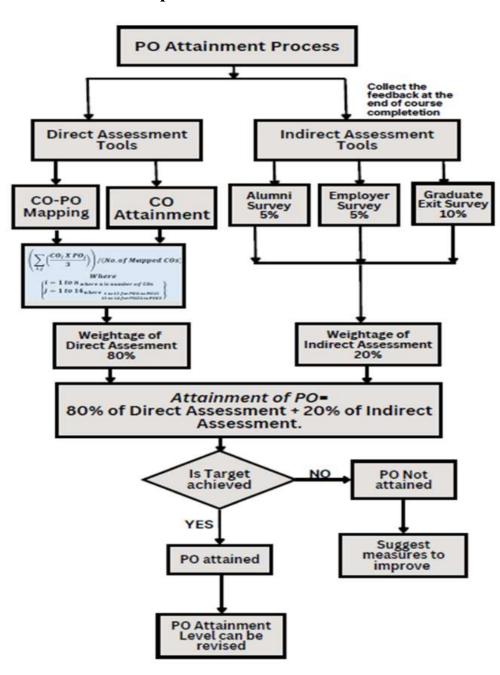
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### **PO Attainment Tools**

# Flow chart for PO Attainment Department of CSE



# TORABETTERS ON COLLEGES NO CO

# SRI VENKATESWARA COLLEGE OF ENGINEERING

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#### **Assessment Tools for measuring PO/PSO attainment:**

Attainment of POs and PSOs is based on **direct assessment tools** as well as **indirect assessment tools**.

#### 1. Direct Assessment Tools:

- Direct assessment of POs and PSOs is based on the students' performance in both internal and End examinations for all courses.
- Based on the mapping of COs with POs and PSOs, the performance of every student in various assessments, such as internal exams, assignments, practical courses, technical seminars, project work, internships, community service projects, and end exams, contributes to the achievement of COs, which in turn leads in the attainment of POs and PSOs.

#### 2. Indirect Assessment Tools:

- The indirect assessment tools that are used for attainment of POs and PSOs are
  - Graduate Exit Survey (10% weightage)
  - Alumni Survey (5% weightage)
  - Employer Survey (5% weightage)

The quality and Relevance of the Process used for measuring Attainment of POs and PSOs:

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

**Step1: Direct Assessment** 

• POs and PSOs attainment at course level are calculated by taking the average of arithmetic multiplication of course outcomes attainment levels and CO-PO matrix.

**Step2: Indirect Assessment:** 

Tools: Graduate Exit Survey, Alumni Survey and Employer Survey

**Process:** Evaluated weighted average of the above-mentioned surveys using the expression mentioned below.

Indirect Survey = 
$$\frac{Gx3 + Ax2 + Sx1}{T}$$

**G:** Total Number of Students gave **GOOD**.

**A:** Total Number of Students gave **Moderate**.

S: Total Number of Students gave Satisfactory.

T: Total Number of Students.

Step3: Overall Attainment of POs and PSOs including Direct and Indirect Survey:

Attainment of POs and PSOs = 80% of Direct Assessment + 20% of Indirect assessment. (0.8\* Direct PO attainment+0.10\* GES+ 0.05 \* AS + 0.05 \* ES)



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### Sample PO Attainment Process of Python Programming

**CO** Attainment related to Python Programming:

М	apping	of CO	s		Intern	Map	ping o	f COs	Exter nal	Direct	Indirect Attainm	СО	% CO
СО	Examination 215		Гerm	Assign ment	al Evalu ation	-	pping o Term xamina	1	Eval uatio n	Attainm ent levels	ent Level (CES)	Attain ed	Attain ed
C215	2.48 2.50 2.34		2.34	3.00	2.58	2.65	2.68	1.81	2.38	2.46	2.70	2.51	83.61
C215	2.59	2.10	2.69	3.00	2.59	2.78	2.28	2.02	2.36	2.45	2.80	2.52	84.08
C215	2.54	2.70		3.00	2.75	2.82	2.52	2.13	2.49	2.59	2.75	2.63	87.51
C215 .4	2.14	2.48		3.00	2.54	2.62	2.45	1.95	2.34	2.42	2.80	2.50	83.19
C215	1.88	2.20		3.00	2.36	2.71	2.54	1.60	2.28	2.31	2.65	2.38	79.35

**CO PO Mapping related to Python Programming:** 

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C215.1	3	2	2	3	2								3	3
C215.2	3	3	3	3	3								3	3
C215.3	3	3	3	3	3								3	3
C215.4	3	3	3	3	3								3	3
C215.5	3	3	3	3	3								3	3

**COPO Assessment:** 

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	CO Attained Levels
C215.1	3	2	2	3	2								3	3	2.51
C215.2	3	3	3	3	3								3	3	2.52
C215.3	3	3	3	3	3								3	3	2.63
C215.4	3	3	3	3	3								3	3	2.50
C215.5	3	3	3	3	3								3	3	2.38

**CO PO Attainment:** 

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO1	PO1	PO1	PSO	PSO
	1	2	3	4	5	6	7	8	9	0	1	2	1	2
CO-PO LEVE L	2.51	2.34	2.34	2.51	2.34								2.51	2.51
% CO- PO	83.5	78.0	78.0	83.5	78.0								83.5	83.5

The program assessment for one course is shown above;

The results for all the other courses for the batch (2020-2024) first to last year will be computed and listed in the PO and PSO.



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### **PO** Assessment

S. No	Course Name	СО РО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	Linear Algebra and Calculus (MA20ABS101)	C111	2.32	2.49										
2	Chemistry (CH20ABS103)	C112	2.02	2.16										
3	Problem Solving using C (CS20AES10)	C113	2.36	2.36	2.21	2.05	2.21							
4	Basic Electrical and Electronics Engineering (EE20AES101)	C114	2.54	1.61										
5	Engineering Workshop (ME20AES101)	C115	2.76	2.58			2.39							
6	IT Workshop (CS20AES103)	C116	2.22	2.07	1.78		2.23							
7	Chemistry Lab (CH20ABS104)	C117	2.73	2.71										
8	Problem Solving using C Lab (CS20AES102)	C118	2.7	2.51	2.52	2.33	2.16							
9	Basic Electrical and Electronics Engineering Lab (EE20AES102)	C119	2.24	2.4	2.24	2.08								
10	Speech and Oral Communication	C1110									2.78	2.79		2.78
11	Differential Equations and Vector Calculus (MA20ABS201)	C121	2.53	2.71										
12	Applied Physics (PH20ABS103)	C122	2.35	2.2	1.57									
13	Communicative English (EG20AHS101)	C123									2.8	2.43		2.62
14	Data Structures (CS20AES201)	C124	2.39	2.39	2.22	2.06	2.22							
15	Engineering Drawing (ME20AES102)	C125	1.8	1.8										
16	Engineering Graphics Lab (ME20AES103)	C126	2.61	2.42	2.61									
17	Communicative English Lab (EG20AHS102)	C127									1.86	1.86		1.86
18	Applied Physics Lab (PH20ABS104)	C128	2.44	2.61										
19	Data Structures Lab (CS20AES202)	C129	2.84	2.65	2.27	2.46	2.65							
20	Universal Human Values (BA20AMC201)	C1210	2.93	2.93				2.9	2.93	2.94	2.94			
21	Logical Skills for Professionals-1 (MA20AMC101)	C1212	2.86	2.67										
22	Discrete Mathematics and Graph Theory (MA20ABS303)	C211	2.81	2.44	1.86									
23	Digital Electronics and Microprocessors (EC20AES301)	C212	2.65	2.3	2.65	1.77	1.56							
24	<b>Software Engineering</b>	C213	2.57	2.22	2.4	2.4	2.23			1.7	1.72			



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	(CS20APC305)								1				
25	Database Management Systems (CS20APC303)	C214	2.58	2.4	2.22	2.22	2.4						
26	Python Programming (IT20APC301)	C215	2.51	2.34	2.34	2.51	2.34						
27	Digital Electronics and Microprocessors Lab (EC20AES302)	C216	2.71	2.49	2.26	2.26	2.04						
28	Database Management Systems Lab (CS20APC304)	C217	2.91	2.52	2.72	2.58	2.72					1.94	2.59
29	Python Programming Lab (IT20APC302)	C218	2.77	2.58	2.59	2.4	2.58						
30	Skill oriented course-I Linux Administration (AM20ASC301)	C219	2.89	2.65	2.41	2.41	2.41						
31	Environmental Science (CH20AMC201)	C2110	2.74					2.57	2.55				
32	Numerical Methods, Probability and Statistics (MA20ABS401)	C221	2.6	2.6									
33	Object Oriented Programming Through Java (CS20APC401)	C222	2.29	2.14	2.14	2.14	2.29				1.89		
34	Computer Organization and Architecture (CS20APC301)	C223	2.3	2.15	2.3	2.15							
35	Design and Analysis of Algorithms (AM20APC301)	C224	2.45	2.45	2.44	2.13	2.45						2.45
36	Business Environment (BA20AHS302)	C225						2.6	2.25	1.76			
37	Object Oriented Programming Through Java Lab (CS20APC402)	C226	2.73	2.55	2.37	2.55	2.37						
38	Computer Organization and Architecture Lab (CS20APC302)	C227	2.48	2.31	2.15	1.98							
39	Algorithms Lab (AM20APC302)	C228	2.64	2.46	2.46	2.64	2.28						
40	Skill Oriented Course-II Exploratory Data Analysis With R (IT20ASC401)	C229	2.94	2.74	2.35	2.35	2.54						
41	Design Thinking for Innovation (CS20AMC401)	C2210	2.59	2.4	2.39	2.16	2.15						
42	Computer Networks (CS20APC501)	C311	2.45	2.45	2.3	2.3	2.27						
43	Formal Languages and Compiler Design (CS20APC502)	C312	2.27	2.27	2.15	2.14							
44	Operating Systems (CS20APC504)	C313	2.51	2.34	2.17	2.32	2.54						
45	Basic VLSI Design (EC20AOE501)	C314	2.33	1.7	1.7								
46	Data Warehousing and	C315	2.53	2.36	2.37	2.36	2.53						



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	Datamining (CS20APE502)												
47	Computer Networks Lab (CS20APC503)	C316	2.88	2.69	2.5	2.5	2.69						
48	Operating Systems Lab (CS20APC505)	C317	2.84	2.65	2.46	2.65	1.89						
49	Skill Oriented Course-III Soft Skills (EG20ASC301)	C318								2.02	2.02		2.02
50	Intellectual Property Rights (BA20AMC502)	C319	2.46					2.32	2.3				
51	Biology for Engineers (CH20AMC301)	C3110	2.79										
52	Community Service Project (CS20ACS501)	C3111	2.86	2.67	2.86			2.38		2.67	2.87	2.62	
53	Technical Seminar Presentation- I (CS20ATS501)	C3112	2.57	2.4	2.4			1.71		1.71	2.57		1.71
54	Cryptography and Network Security (CS20APC601)	C321	2.35	2.2	2.19	2.35	2.2						
55	Machine Learning (CS20APC603)	C322	2.33	2.16	2.01	2.33	2.33					2.01	2.16
56	Web and Internet Technologies (CS20APC605)	C323	2.54	2.54	2.36	2.21	2.19						
57	Big Data Analytics (CS20APE602)	C324	2.33	2.17	2.33	2.33	2.18						
58	Water Resources Planning & Management (CE20AOE603)	C325	2.52	2.18	2.42								
59	Cryptography and Network Security Lab (CS20APC602)	C326	2.73	2.73	2.92	2.34	2.44						
60	Machine Learning Lab (CS20APC604)	C327	2.71	2.53	2.35	2.53	2.71						
61	Web and Internet Technologies Lab (CS20APC606)	C328	2.96	2.76	2.96	2.76	2.96						
62	Skill Oriented Course-V Dev Ops (CS20ASC601)	C329	2.62	2.28	2.45	2.6	2.18						
63	Constitution of India (BA20AMC501)	C3210						2.74	2.57	2.39			
64	Technical SeminarPresentation- II (CS20ATS601)	C3211	2.96	2.76	2.96	2.76				2.76	2.96		2.95
65	Logical Skills for Professionals-II (MA20AMC301)	C3213	2.57	2.42									
66	Service oriented Architecture (CS20APE705)	C411	2.51	2.18	2.34	2.33	2.36						
67	Software Project Management (CS20APE710)	C412	2.24	2.39	2.23	2.24	2.24					2.08	
68	Cloud Computing (CS20APE712)	C413	2.61	2.45	2.44	2.43	2.27						



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69	Air Pollution and Quality Control (CE20AOE701)	C414	2.79	2.6	1.91								
70	Embedded Systems (EE20AOE701)	C415	2.73	2.54	2.38								
71	Management Science (BA20AHS705)	C416	2.27	1.97	1.82								
72	Skill Oriented Course-V MOOC-2 (NPTEL)/Digital Marketing (CS20ASC701)	C417	2.83	2.45	2.26	2.2	2.52	2.36		1.87	2.82	2.59	2.83
73	Industrial/Research Internship 1 Month Evaluation Mini Project (CS20AIP701)	C418	2.85	2.66	2.47	2.47	2.66			1.9	2.09	2.85	2.09
74	Project Work Stage-I (CS20APW701)	C419	2.82	2.63	2.45	2.63	2.82			2.07	2.45	2.44	2.45
75	Technical Seminar Presentation- III (CS20ATS701)	C4110	2.88	2.69	2.69			1.92		1.92	2.88		1.91
76	Project Work Stage – II / Full Internship in Industry (CS20APW801)	C421	2.94	2.8	2.83	2.81	2.5	2.35		2.38	2.24	2.93	2.52

### **PSO** Assessment:

S. No	Course Name	CO PO	PSO1	PSO2
1	Linear Algebra and Calculus (MA20ABS101)	C111		
2	Chemistry (CH20ABS103)	C112		
3	Problem Solving using C (CS20AES10)	C113	2.36	1.57
4	Basic Electrical and Electronics Engineering (EE20AES101)	C114		
5	Engineering Workshop (ME20AES101)	C115		
6	IT Workshop (CS20AES103)	C116	2.22	1.78
7	Chemistry Lab (CH20ABS104)	C117		
8	Problem Solving using C Lab (CS20AES102)	C118	2.7	2.16
9	Basic Electrical and Electronics Engineering Lab (EE20AES102)	C119		
10	Speech and Oral Communication	C1110		
11	Differential Equations and Vector Calculus (MA20ABS201)	C121		
12	Applied Physics (PH20ABS103)	C122		
13	Communicative English (EG20AHS101)	C123		
14	Data Structures (CS20AES201)	C124	2.39	2.22
15	Engineering Drawing (ME20AES102)	C125		
16	Engineering Graphics Lab (ME20AES103)	C126		
17	Communicative English Lab (EG20AHS102)	C127		
18	Applied Physics Lab (PH20ABS104)	C128		
19	Data Structures Lab (CS20AES202)	C129	2.84	2.46
20	Universal Human Values (BA20AMC201)	C1210		
21	Logical Skills for Professionals-1 (MA20AMC101)	C1212		
22	Discrete Mathematics and Graph Theory (MA20ABS303)	C211		



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23	Digital Electronics and Microprocessors (EC20AES301)	C212		
24	Software Engineering (CS20APC305)	C213	2.4	2.57
25	Database Management Systems (CS20APC303)	C214	2.58	2.4
26	Python Programming (IT20APC301)	C215	2.51	2.51
27	Digital Electronics and Microprocessors Lab (EC20AES302)	C216		
28	Database Management Systems Lab (CS20APC304)	C217	2.91	2.72
29	Python Programming Lab (IT20APC302)	C218	2.77	2.4
30	Skill oriented course-I Linux Administration (AM20ASC301)	C219	2.89	2.65
31	Environmental Science (CH20AMC201)	C2110		
32	Numerical Methods, Probability and Statistics (MA20ABS401)	C221		
33	Object Oriented Programming Through Java (CS20APC401)	C222	2.29	2.29
34	Computer Organization and Architecture (CS20APC301)	C223	2.3	2.15
35	Design and Analysis of Algorithms (AM20APC301)	C224	2.45	2.28
36	Business Environment (BA20AHS302)	C225	2.6	2.6
37	Object Oriented Programming Through Java Lab (CS20APC402)	C226	2.73	2.73
38	Computer Organization and Architecture Lab (CS20APC302)	C227	2.31	1.98
39	Algorithms Lab (AM20APC302)	C228	2.46	2.28
40	Skill Oriented Course-II Exploratory Data Analysis With R (IT20ASC401)	C229	2.94	2.54
41	Design Thinking for Innovation (CS20AMC401)	C2210	2.19	1.96
42	Computer Networks (CS20APC501)	C311	2.3	1.95
43	Formal Languages and Compiler Design (CS20APC502)	C312	2.27	1.67
44	Operating Systems (CS20APC504)	C313	2.51	2.51
45	Basic VLSI Design (EC20AOE501)	C314		
46	Data Warehousing and Datamining (CS20APE502)	C315	2.53	2.53
47	Computer Networks Lab (CS20APC503)	C316	2.69	2.5
48	Operating Systems Lab (CS20APC505)	C317	2.65	2.08
49	Skill Oriented Course-III Soft Skills (EG20ASC301)	C318		
50	Intellectual Property Rights (BA20AMC502)	C319		
51	Biology for Engineers (CH20AMC301)	C3110		
52	Community Service Project (CS20ACS501)	C3111	2.48	2.29
53	Technical Seminar Presentation- I (CS20ATS501)	C3112	2.4	2.05
54	Cryptography and Network Security (CS20APC601)	C321	2.19	2.35
55	Machine Learning (CS20APC603)	C322	2.33	2.16
56	Web and Internet Technologies (CS20APC605)	C323	2.54	2.54
57	Big Data Analytics (CS20APE602)	C324	2.33	2.18
58	Water Resources Planning & Management (CE20AOE603)	C325		
59	Cryptography and Network Security Lab (CS20APC602)	C326	2.92	2.92
60	Machine Learning Lab (CS20APC604)	C327	2.71	2.71



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61	Web and Internet Technologies Lab (CS20APC606)	C328	2.96	2.96
62	Skill Oriented Course-V Dev Ops (CS20ASC601)	C329	2.28	2.28
63	Constitution of India (BA20AMC501)	C3210		
64	Technical SeminarPresentation- II (CS20ATS601)	C3211	2.46	2.46
65	Logical Skills for Professionals-II (MA20AMC301)	C3213		
66	Service oriented Architecture (CS20APE705)	C411	2.51	2.33
67	Software Project Management (CS20APE710)	C412	2.24	2.39
68	Cloud Computing (CS20APE712)	C413	2.44	2.43
69	Air Pollution and Quality Control (CE20AOE701)	C414		
70	Embedded Systems (EE20AOE701)	C415		
71	Management Science (BA20AHS705)	C416		
72	Skill Oriented Course-V MOOC-2 (NPTEL)/Digital Marketing (CS20ASC701)	C417	2.26	2.08
73	Industrial/Research Internship 1 Month Evaluation Mini Project (CS20AIP701)	C418	2.85	2.47
74	Project Work Stage-I (CS20APW701)	C419	2.44	2.26
75	Technical Seminar Presentation- III (CS20ATS701)	C4110	2.69	2.3
76	Project Work Stage – II / Full Internship in Industry (CS20APW801)	C421	2.61	2.39



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Table PO/PSO attainment of 2020-24 batch through Assessment Tool

Table PO	/I SO att	scholar indicates	NUMBER OF STREET	TO STATE OF THE PARTY OF THE PA	NO. OF THE OWNER, WHEN THE PARTY OF					BOO	TO 10	DOM	DO10	DECA	TECO
PC	)	POI	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	POH	PO12	PSO1	PSO2
DIRECT ATTAIN MENT LEVEL	80% PO Assessm ent Level	2.07	1.94	1.88	1.88	1.89	1.91	2.06	1.80	1.78	1.96	2.00	1.88	2.02	1.87
	EMPLO YER SURVE Y (5%)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.12	0.12	0.12	0.12	0.13	0.13
INDIREC T ATTAIN MENT	ALUMI NI SURVE Y (5%)	0.13	0.13	0.12	0.13	0.12	0.12	0.13	0.12	0.13	0.12	0.13	0.13	0.13	0.13
LEVEL	GRADU ATE EXIT SURVE Y (10%)	0.28	0.28	0.28	0.28	0.29	0.28	0.27	0.28	0.27	0.28	0.26	0.27	0.27	0.28
PO ATTAINMENT LEVEL (80% Direct attainment +20% Indirect Attainment)		2.60	2.47	2.40	2.41	2.42	2.42	2.58	2.33	2.30	2.48	2.52	2.41	2.54	2.41
PO TAI LEV		2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
PO ATTAI		Attai ned	Attai ned	Attai ned	Attai ned	Attai ned	Attai ned	Attai ned	Not Attai ned	Not Attai ned	Attai ned	Attai ned	Attai ned	Attai ned	Attai ned

### ANALYSIS:

Based on the above result it was found that PO8, PO9 had not reached the target attainment level.

### **SUGGESTION:**

- Arranging Technical visit to varies industries to gain knowledge on various practical solutions for real time problems.
- Encouraging to do more minor projects through technical clubs.
- Career readiness program, corporate lectures & motivational talks are arranged.
- Make the environment to apply their knowledge of ethics to the respective work place environment.

Incharge

Signature of HOD