Establish the connect between the courses and POs (15)

POs	Details	Courses*
PO-1	Apply the knowledge of science, mathematics, and engineering principles for developing problem solving attitude	Advanced Treatment of Water and Waste Water Advanced Hydrology and Hydraulics Stochastic Hydrology Urban Hydrology and Drainage Environmental Impact Assessment Economics, Planning & Management of Systems, Elective-I, Elective-II, Elective-III and Elective-IV
PO-2	Ability to write and present a substantial technical report / document.	Environmental Impact Assessment Dissertation I Dissertation II, Mini Project, Lab practice II Seminar, Research Methodology
PO-3	Students should be able to demonstrate a degree of mastery in Environmental and Water Resources Engineering. The mastery should be at a level higher than therequirements in the appropriate bachelor program.	Advanced Treatment of Water and Waste Water Advanced Hydrology and Hydraulics Stochastic Hydrology Urban Hydrology and Drainage Environmental Impact Assessment Economics, Planning & Management of Systems, Elective-I, Elective-II, Elective-III and Elective-IV
PO-4	Gain knowledge / skill in integrating Environment and Water resources concepts for collaborative multidisciplinary solutions and carry out planning and management of projects as a member and a leader in a team considering economic and financial factors.	Economics, Planning & Management of Systems, Environmental Impact Assessment Dissertation I Dissertation II, Mini Project, Seminar, Research Methodology

PO-5	Recognize the need for, and have ability in lifelong learning independently for professional advancement, demonstrate professional ethics, work culture and understanding of responsibility to contribute to community for sustainable development of society.	Dissertation I Dissertation II, Mini Project, Seminar, Lab practice II Research Methodology Environmental Impact Assessment Humanities,

Table: 2.1.1(a)

POs as defined before May 2017 in Annexure-I

Pos	**Details**	**Courses***
PO-a	Demonstrate in depth knowledge of Environmental and Water Resources Engineering with wider and global perspective with an ability to evaluate, analyze, and synthesize existing and advanced technology.	Advanced Treatment of Water and Waste Water Advanced Hydrology and Hydraulics Statistical Methods in Hydrology Urban Hydrology and Drainage Environmental Impact Assessment Economics, Planning & Management of Systems, Elective-I, Elective-II, Elective-III and Elective-IV
PO-b	Synthesize the information and Critically Analyze complex problems to make intellectual or creative advances.	Advanced Treatment of Water and Waste Water Advanced Hydrology and Hydraulics Statistical Methods in Hydrology Urban Hydrology and Drainage Environmental Impact Assessment Economics, Planning & Management of Systems, Elective-I, Elective-II, Elective-III and Elective-IV
PO-c	Solve the problems and arrive at feasible, optimal solutions after considering public health and safety, social and environmental factors.	Advanced Treatment of Water and Waste Water Advanced Hydrology and Hydraulics Statistical Methods in Hydrology Urban Hydrology and Drainage

		Environmental Impact Assessment Economics, Planning & Management of Systems, Elective-I, Elective-II, Elective-III and Elective-IV
PO-d	Demonstrate to carry out original and useful research in key areas of Environmental and Water resources engineering	Statistical Methods in Hydrology Dissertation I Dissertation II, Mini Project, Seminar, Research Methodology
PO-e	Generate, select, learn and apply appropriate techniques, resources and software to solve complex engineering problems.	Dissertation I Dissertation II, Mini Project, Seminar, Lab practice II
PO-f	Gain knowledge / skill in integrating Environment and Water resources concept for collaborative multidisciplinary solutions	Open Elective, Departmental Electives, Environmental Impact Assessment Intellectual Property Rights
PO-g	Carry out planning and management of projects as a member and a leader in a team considering economic and financial factors.	Economics, Planning & Management of Systems Dissertation I Dissertation II Mini Project
PO-h	Communicate with the engineering community and society regarding complex engineering activities confidently and effectively.	Lab Practice I, Lab Practice II, Dissertation I Dissertation II, Mini Project, Seminar
PO-i	Recognize the need for, and have ability in lifelong learning independently for professional advancement.	Dissertation I Dissertation II, Mini Project, Seminar

PO-j	Demonstrate professional ethics, work culture and understanding of responsibility to contribute to community for sustainable development of society.	Humanities, Intellectual Property Rights Dissertation I Dissertation II, Mini Project, Seminar
PO-k	Introspect critically outcome of actions, take corrective measures and learn from mistakes independently.	Dissertation I Dissertation II

PO Attainment for Batch July 2013- June 2015

Name of Course	Credits	PO-a	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k
Numerical Methods [To be offered to other programs]	3	81.5	79.8	75								
Advanced Treatment of Water and Waste Water	4	71.8	70.6	71.5								
Elective – I	3	53.9	63.7	73.3								
Elective – II	3	77.3	74.2	72.7								
Lab Practice I	1	76.9			76.9		76.9				76.9	76.9
Seminar	1										81.9	81.9
Stochastic Hydrology	4	53.9	63.7	73.3								
Urban Hydrology and Drainage	4	61.9	63.1	63								
Environmental Impact Assessment	4	62.8	71.9	76.5		63.1	63.1		63.1			
Elective – III (Remote Sensing and GIS)	3	64.4	64.7	58.5								
Elective – IV (Channel and River Hydraulics)	3	51.6	59.8	65.6								
Lab Practice II	1	76	76		76	76	76	76	76		76	76
Communication Skills	2								69.3			
Dissertation Phase – I	9	68.8	68.8	68.8	68.8							
Economics, Planning & Management of Systems	4	58.3	55.7	60.6		60.6						
Dissertation Phase - II	18				65.4	65.4	67.5	67.5	66.3	65	65	65
Constitution of India	2										73.4	
Surface Hydrologic	4	70.6	69.6	69.8								

System												
Computational Fluid Dynamics	3	70.9	70.4	63.4								
% PO Attainment		65.8	66.2	66.1	67.2	64.7	67.5	67.9	66.4	65	67.5	66.9

Table: 2.2.2 (A)

PO Attainment for Batch July 2014- June 2016

Name of Course	Credits	PO-A	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k
Numerical Methods [To be offered to other programs]	3	71.9	75.3	73.1								
Advanced Treatment of Water and Waste Water	4	69.8	70.5	69.8		67.5	67.5		67.5			
Surface Hydrologic System	4	74.5	74.7	74.1								
Elective – II (Water Resources Systems Planning &management)	3	66.6	69.4	73.1								
Lab Practice I	2	76.3			76.3		76.3				76.3	76.3
Seminar	1										66.8	66.9
Stochastic Hydrology	4	62.1	62.5	68.1								
Urban Hydrology and Drainage	4	55.5	57.1	56.5								
Environmental Impact Assessment	4	61.8	67.5	73.1		67.1	67.1		67.1			
Elective – III (Remote Sensing and GIS)	3	79.4	78.6	73.1								
Elective – IV (Channel and River Hydraulics)	3	63.5	61.3	61.4								
Lab Practice II	2	81.8	81.8		81.8	81.8	81.7	81.7	81.7		81.7	81.7
Communication Skill	2								54.4			
Dissertation Phase – I	9	76.5	76.5	76.5	76.5							
Economics, Planning & Management of Systems	4	55.8	53.9	52		52						
Dissertation Phase - II	18				70.9	70.9	70.9	70.9	70.9	70.9	70.8	70.9
Constitution of India	2										73.4	
Surface Hydrologic System	4	74.5	74.7	74.1								
Computational Fluid Dynamics	3	69	64.2	61.8		45.1						
% PO Attainment		66.8	64.5	69	73.6	66.3	71	72	69.6	70.9	72.2	72.1

Table: 2.2.2 (B)

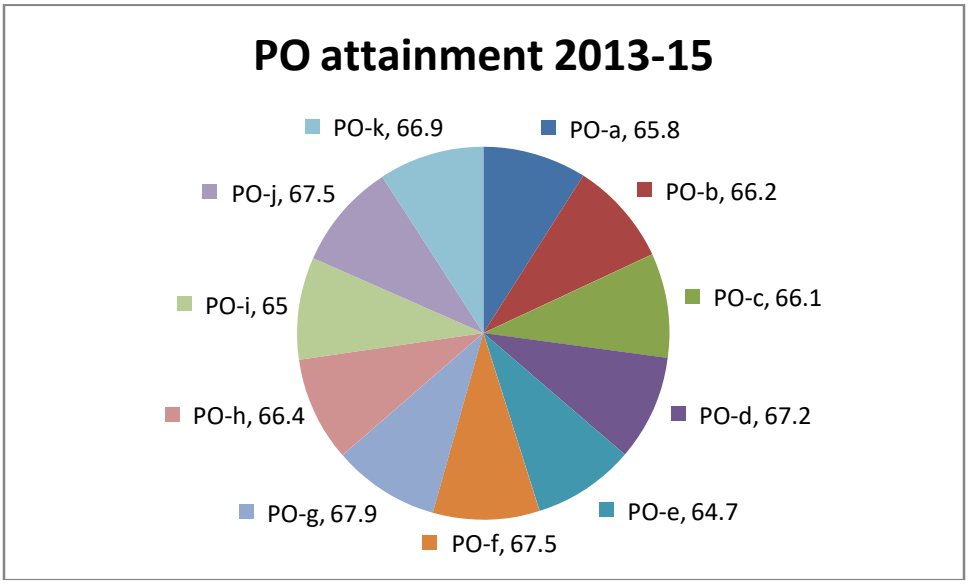
PO Attainment for Batch July 2015- June 2017

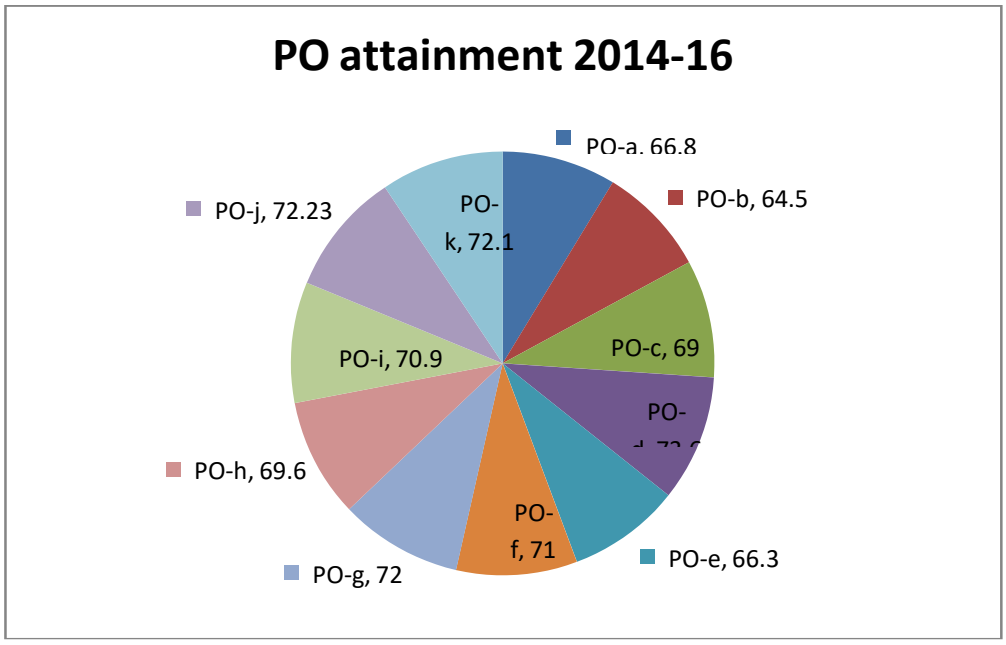
Name of Course	Credits	PO-a	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k
Adv. Treatment of Water and Waste Water	4	57	57	57		54	44		44			
Advanced Hydrology and Hydraulics	4	71	67									
Elective – I Channel and River Hydraulics	3	63	60	63								
Elective – II (DREC)	3	100	100	100								
Lab Practice I	2	100			100		100					
Seminar	1										100	100
Stochastic Hydrology	4	68	76	76		89						
Urban Hydrology and Drainage	4	63	80	34								
Environmental Impact Assessment	4	57	57	57		54	44		44			
Elective – III Solid &Haz. Waste Mgt	3	95	95	100								
Elective – IV CFD	3	70	74	77								
Lab Practice II	2	94	94		94	94	94	94	94		94	94
Mini Project	1	94	94		94		94	94	94		94	94
Dissertation Phase – I	10	100	100	100	100							
Economics, Planning & Management of Systems	4	71	70	69		73						
Dissertation Phase - II	18				84	84	84	84	84	84	84	84
% PO Attainment		78.7	79.5	76	90.7	77.2	75.7	85.4	74	84	86.1	86.1

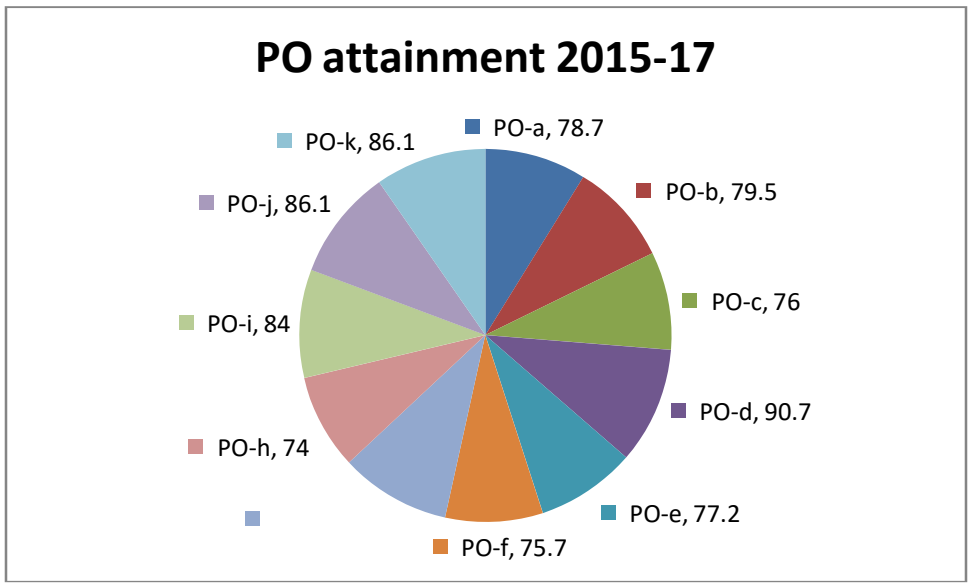
PO Attainment for Batch July 2016- June 2018

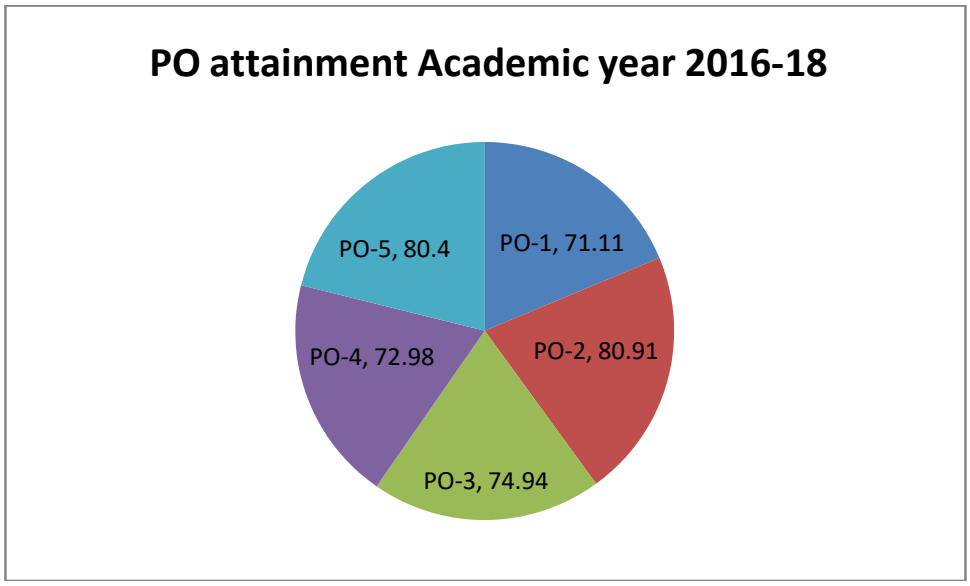
Name of Course	**Credits**	**PO-1**	**PO-2**	**PO-3**	**PO-4**	**PO-5**
Adv. Treatment of Water and Waste Water	4	60.29		60.29	54.22	
Advanced Hydrology and Hydraulics	4	48.9		48.9		
Elective – I Channel and River Hydraulics	3	60.98		60.98		
Elective – II (DREC)	3	65.55		65.55	76.35	
Lab Practice I	2	70.06	70.06	70.06		70.06
Seminar	1	80.69	80.69	80.69	80.69	80.69
Stochastic Hydrology	4	56.7		61.93		
Urban Hydrology and Drainage	4	67.05		67.05	61.15	

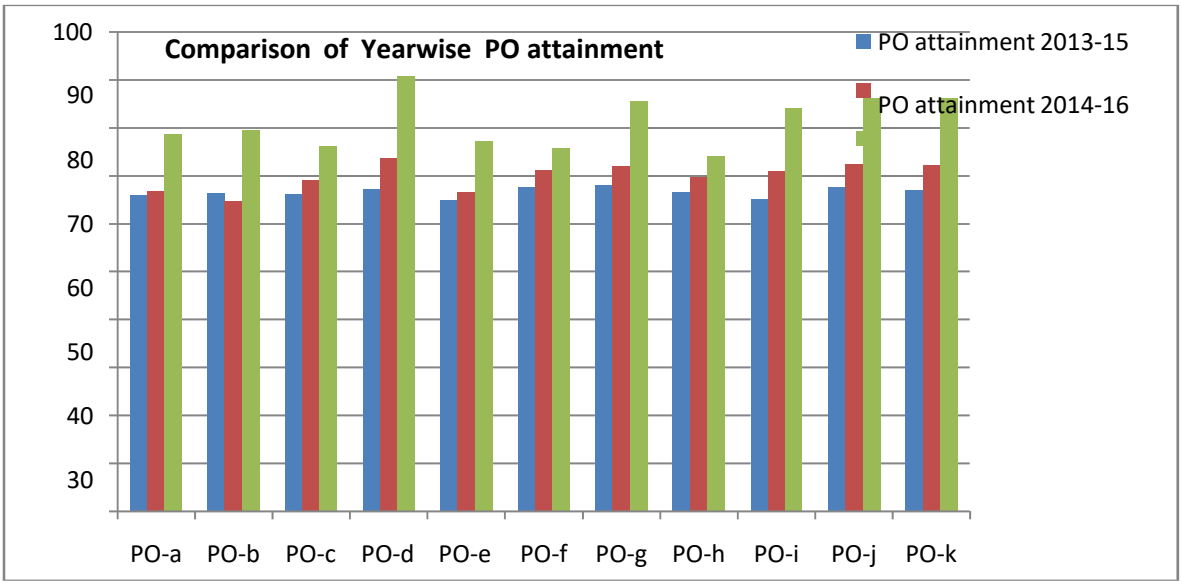
Environmental Impact Assessment	4	60.22	70.4	60.22	65.14	70.4
Elective – III Solid & Haz. Waste Mgt	3	79.11		75.29	66.06	
Elective – IV CFD	3	61.67		61.67	57.7	
Lab Practice II	2	59.25	59.25	59.25	59.25	59.25
Mini Project	1	82.42	82.42	82.42	82.42	82.42
Liberal Learning Course	1		69.23			69.23
Dissertation Phase – I	10	80.62	80.62	80.62	80.62	80.62
Economics, Planning & Management of Systems	4	53		53	49	
Dissertation Phase - II	18	86.87	87.61	86.31	86.31	86.5
% PO Attainment		**71.11**	**80.91**	**74.94**	**72.98**	**80.4**




PO attainment 2014-16
PO-a, 66.8
PO-b, 64.5
PO-c, 69
PO-
PO-e, 66.3
PO-
f, 71
PO-g, 72
PO-h, 69.6
PO-i, 70.9
PO-j, 72.23
PO-
k, 72.1


PO attainment 2015-17
PO-a, 78.7
PO-b, 79.5
PO-c, 76
PO-d, 90.7
PO-e, 77.2
PO-f, 75.7
PO-h, 74
PO-i, 84
PO-j, 86.1
PO-k, 86.1





PO attainment as per May 2017 format for Academic Year 2013-15

Sr. No.	Programme Outcomes (as per May 2017format)	Programme outcomes as per 2013 document	PO attainment	Average % PO attainment
1	**PO1**	PO_b, PO_c, PO_d, PO_e, PO_j,	PO_b= 66.20 PO_c = 66.10 PO_d=67.20 POe=64.70	66.34

			POj= 67.50	
2	PO2	PO_h	PO_h= 66.40	66.4
3	PO3	POa	POa=65.80	65.80
4	PO4	PO_f, PO_g	PO_f= 67.50 POg= 67.90	67.7
5	PO5	PO_i, PO_k	PO_i= 65.00 PO_k= 66.90	65.95

PO attainment as per May 2017 format for Academic Year 2014-16

Programme Outcomes (as per May 2017format)	Programme outcomes as per 2013 document	PO attainment	Average % PO attainment
PO1	PO_b, PO_c, PO_d, PO_e, PO_j,	PO_b= 64.50 PO_c = 69.00 PO_d=71.60 POe= 66.30 POj= 72.20	68.72
PO2	PO_h	PO_h= 69.60	69.60
PO3	POa	POa= 66.8	66.8
PO4	PO_f, PO_g	PO_f= 71.00 POg= 72.00	71.50
PO5	PO_i, PO_k	PO_i= 70.90 PO_k= 72.10	71.50

PO attainment as per May 2017 Format for Academic year 2015-17

Sr. No.	Programme Outcomes (as per May 2017 format)	Programme outcomes as per 2013 document	PO attainment	Average % PO attainment
1	**PO1**	PO_b, PO_c, PO_d, PO_e, PO_j,	PO_b=79.50 PO_c = 76.00 Po_d= 90.70 Poe= 77.20 POj= 86.10	81.90
2	PO2	PO_h	PO_h= 74.00	74.00

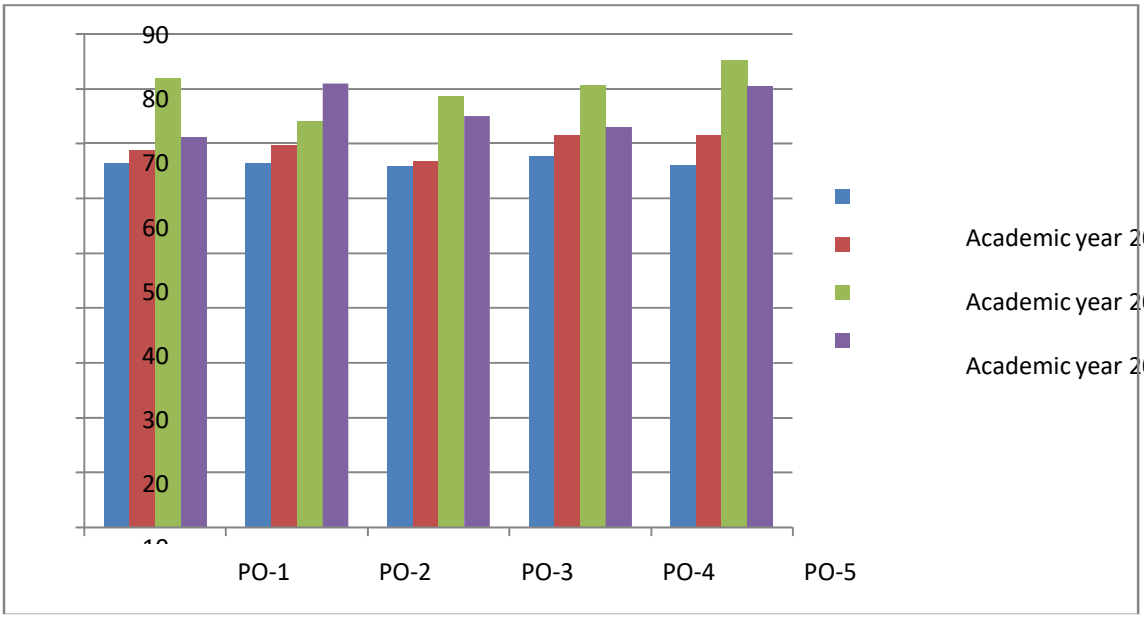
3	PO3	POa	POa= 78.70	78.70
4	PO4	PO_f, PO_g	PO_f= 75.70 POg= 85.40	80.55
5	PO5	PO_i, PO_k	PO_i= 84.00 PO_k= 86.10	85.05

PO attainment as per May 2017 format for Academic year 2016-18

Sr. No.	Programme Outcomes	% PO attainment
1	PO-1	71.11
2	PO-2	80.91
3	PO-3	74.94
4	PO-4	72.98
5	PO-5	80.4

Comparative PO attainment for Year 2013-15, 2014-16, 2015-17 and 2016-18

POs	**Academic year 2013-15**	**Academic year 2014-16**	**Academic year 2015-17**	**Academic year 2016-18**
P O 1	66.34	68.72	81.90	71.11
P O 2	66.4	69.60	74.00	80.91
P O 3	65.80	66.8	78.70	74.94
P O 4	67.7	71.50	80.55	72.98
P O 5	65.95	71.50	85.05	80.4



Observations on attainment levels for each of the POs.