Criterion 2 - Teaching-learning and Evaluation

2.1 Student Enrollment and Profile

2.1.1 Average Enrolment percentage (Average of last five years)

Response: 52.54

2.1.1.1 **Number of students admitted year-wise during last five years**

2020-21	2019-20	2018-19	2017-18	2016-17
254	173	260	297	336

2.1.1.2 **Number of sanctioned seats year wise during last five years**

2020-21	2019-20	2018-19	2017-18	2016-17
423	423	552	552	552

File Description	Document
Institutional data in prescribed format	View Document
Any additional information	View Document

2.1.2 Average percentage of seats filled against reserved categories (SC, ST, OBC, Divyangjan, etc. as per applicable reservation policy) during the last five years (exclusive of supernumerary seats)

Response: 69.34

2.1.2.1 Number of actual students admitted from the reserved categories year-wise during the last five years

2020-21	2019-20	2018-19	2017-18	2016-17
160	171	258	297	334

File Description	Document
Average percentage of seats filled against seats reserved	View Document
Any additional information	View Document

2.2 Catering to Student Diversity

2.2.1 The institution assesses the learning levels of the students and organises special Programmes for advanced learners and slow learners

Response:

Examinations result and technical knowledge of the students are the very much important aspects for the best placement of the college. Result is improved by giving better attention to the slow learners. First hour test per day and three Periodical tests per semester are conducted to the students of all the branches. From the results of the previous semester exam and the Internal Assessment Tests, the students are segregated to the slow learners from the advanced learners. Students who secure pass marks in all the subjects in the university exams are considered as advanced learners, rest of them are slow learners.

Programmes for Advanced Learners:

The following programmes are conducted for advanced learners to make them engaged in many activities for improving their technical and soft skills.

- The advanced learners are guided to refer text books prescribed by Anna University for their studies.
- They are advised to do mini projects and participate in the paper/project presentations conducted by other institutions.
- Advanced learners are also involved in clearing the doubts of slow learners.
- They are also trained in the following areas as per their interest for the betterment of placements, competitive examinations and higher studies.

- Communication skills in English
- Basic computer programming
- Aptitude skills
- Leadership exposure and professional skill development
- Software oriented skills
- Coaching for GATE examination and Higher studies
- Department oriented skill developments for placements
- Club activities

- The advanced learners are also guided to go through the refereed journals to know the current technologies in their specific areas
- Faculties handling different courses interact with students in clearing their doubts and applying their knowledge and skill to practical problems.
- The advanced learners are also advised to undergo in-plant raining and internship programmes in the industries.
- They are advised to participate in the online learning courses like NPTEL
- In addition to academics, club, cultural and sports activities are conducted which foster leadership quality, decision making ability, team spirit, precision, analytical capability, socio-psychological

awareness etc. which make an individual an intellectually mature being. The college puts forward efforts to realize total development of the student.

Programmes for Slow learners:

- Review of their class attendance and internal test performance.
- Remedial Classes are conducted by the subject experts beyond working hours which is not a part of their time-table.
- Effective mentoring and for the welfare of the students, 20 students are allotted to a faculty mentor.
- Short form of notes in the poor performance subjects is given to them instead of learning from books
- A bridge course and a test are also conducted to the students entering in the first year and in second year lateral entry students.
- The Institution conducts the bridge courses for all the students in communicative English, mathematical foundation and computer Literacy course before the commencement of class work. This will reduce the fear and communication problems of the rural students.
- The tests are conducted regularly during the first hour and the slow learners will be trained during the last hour if they fail in the first hour test.

File Description	Document
Upload any additional information	View Document
Past link for additional Information	View Document

2.2.2 Student- Full time teacher ratio (Data for the latest completed academic year)

Response: 8:1

File Description	Document
Any additional information	View Document

2.3 Teaching- Learning Process

2.3.1 Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences

Response:

The institution supports student-centric learning through its efforts by creating a learning atmosphere which allows students to think in different way, respond and pose questions. It arranges several of experiential and participative learning activities to broaden the scope of education imparted to the students. Guest lectures and industrial visits are arranged for students to develop their interactive, collaborative and

independent learning.

Experiential Learning

Experiential learning is the method of learning through experience, and is more specifically meant as ‘learning through reflection on doing’.

Hands-on training is a form of experiential learning and is useful to make the students expertise in their interested domains by improving the practical knowledge. Hands on trainings are conducted in different domains so that the students can learn and apply the concepts studied in the subjects.

More experiments are conducted in practical classes; the experiments beyond the syllabus are also conducted. These experiments will enhance the standard of the students with respect to the practical knowledge. So, the students are able to do mini project during third year and main project in the final year during their course.

Several industry visits are arranged to provide the students practical knowledge which update them with the current technology. The students undergo in-plant training in industries and present case-studies.

Participative Learning

The institute organizes different activities for students as well as promotes them to participate in various competitions held at local, national & international levels.

The activities organized by institute include Student Development Programs, Workshops, Conferences, Technical symposium and project competitions, interdisciplinary projects.

The institution has the facility of teaching aids such as Over Head Projectors, LCD projectors connected with Computers, broadband internet connectivity and Wi-Fi connectivity.

The library has the internet facility to access all the journal, e-material, e-books etc., enabling the students and faculty to keep abreast of the latest developments in their respective fields.

All the departments conduct a number of activities like seminars, debates, group discussions, and quizzes. Such activities develop stage courage, skills of expression, thinking power among the students. These events are conducted for the students every Saturday afternoon.

Co-Curricular activities like paper presentation, project presentation are organized regularly. Through these assignments that include intensive interaction and participation, students are seen to grasp concepts better and faster.

Problem Solving Methods

The Students are advised to work on real time problems by taking sponsored industrial projects and also are encouraged to read the magazines, journals, CD-ROM data bases and latest information available on the internet & in the library. Design oriented subjects enhance the problems solving capacity of the students.

Aptitude classes and the tests are conducted along with regular classes and also in the afternoon of every Saturday. Two to three assignments are given to the students on every subject in order to improve the problem solving methods. The design methods of various circuits and models/modules learned in theoretical and practical subjects will enhance the quality of problem solving ability. Students' development programmes are conducted for 3 to 4 days every semester.

File Description	Document
Upload any additional information	View Document
Link for additional information	View Document

2.3.2 Teachers use ICT enabled tools for effective teaching-learning process.

Response:

ICT infusion is followed in teaching methodologies to improve learning, motivate and engage learners, promote collaboration, foster enquiry and exploration and create a new learner centered learning culture. It permits the move from reproductive model of teaching and learning to an independent, autonomous learning model that promotes initiation, creativity and critical thinking with independent research. Learners are expected to collect, select, analyze, organize, extend, transform and present knowledge using ICT in authentic and active learning paradigm. The Institute has 90 Mbps leased line with 591 computers connected through LAN and Wi-Fi. Class rooms are equipped with LCD projectors.

Faculties utilize three types of ICT tools such as

1. Generic tools for learning: Starting from productivity tools to simulation & modeling to access, extend, transform and share information e.g. Licensed and open source software for lab and Projects.

2. Content-based resources: to access a vast source of educational resources that effectively can be integrated with the curriculum objectives e.g NPTEL-SWAYAM. DELNET is available in the library for faculty and students to search for the various books and journals available in the library.

3. Interactive instructional courseware: Self-paced learning materials e.g Google Class Room LMS, Video Lecture, Course material in website, YouTube channel. etc. The entire faculty prepares the lecture notes referring the standard books pertaining to the subject. These lecture notes are uploaded in the college website for students 'reference. In this manner students are aware of the topics their faculty is taking/ would be taking in the next class, and thus can prepare well in advance before actually the faculty takes that topic and gets their queries clarified by the faculty. Online lecture notes also help the students, who missed the class due to some reason, to be updated with the lectures

Teaching methodologies like Flipped Classroom, assignments and Internal Assessment Test question papers, Subject wise are compiled by faculty members and are made available on website. Practical conduction is carried out through various licensed and open source Simulation Software. These platforms

are very useful during the lockdown period and can be summarized as

Activity	Platform
Interactive Classes	Google Meet, Google Class Room
Video Lectures	Google Class Room, Youtube
Laboratories, Project Works	Virtual Lab, Google Meet
Webinars and Conference	Google Meet
Assignments and Internal Assessment Test	Google Class Room

The semester examinations also have been conducted by the University through online mode. The question papers have been collected by the college though web portal and sent to the students through Google Class room. The answer papers have been scanned and sent through the same Google Class room by the students.

Number of teachers using ICT for handling the classes effectively during the academic year 2020-21

Number of teachers using ICT (LMS, e-Resources)	Number of teachers on roll	ICT tools and resources available	Number of ICT enabled classrooms	Number classroom
107	107	LCD Projector, Wired Network (LAN),Wireless Network (Wi-Fi-), High Speed Internet, Computers, Digital Library, Microsoft Power Point, Youtube Google Meet, Google Class Room	33	05

File Description	Document
Upload any additional information	View Document
Provide link for webpage describing the ICT enabled tools for effective teaching-learning process	View Document

2.3.3 Ratio of students to mentor for academic and other related issues (Data for the latest completed academic year)

Response: 15:1

2.3.3.1 Number of mentors

Response: 58

File Description	Document
Upload year wise, number of students enrolled and full time teachers on roll.	View Document
mentor/mentee ratio	View Document
Circulars pertaining to assigning mentors to mentees	View Document

2.4 Teacher Profile and Quality

2.4.1 Average percentage of full time teachers against sanctioned posts during the last five years

Response: 107.76

File Description	Document
Year wise full time teachers and sanctioned posts for 5years(Data Template)	View Document
List of the faculty members authenticated by the Head of HEI	View Document
Any additional information	View Document

2.4.2 Average percentage of full time teachers with Ph. D. / D.M. / M.Ch. / D.N.B Superspeciality / D.Sc. / D.Litt. during the last five years (consider only highest degree for count)

Response: 21.75

2.4.2.1 **Number of full time teachers with *Ph. D. / D.M. / M.Ch. / D.N.B Superspeciality / D.Sc. / D.Litt.* year wise during the last five years**

2020-21	2019-20	2018-19	2017-18	2016-17
26	25	29	27	18

File Description	Document
List of number of full time teachers with Ph. D. / D.M. / M.Ch. / D.N.B Superspeciality / D.Sc. / D.Litt. and number of full time teachers for 5 years (Data Template)	View Document
Any additional information	View Document

2.4.3 Average teaching experience of full time teachers in the same institution (Data for the latest completed academic year in number of years)

Response: 8.06

2.4.3.1 **Total experience of full-time teachers**

Response: 862

File Description	Document
List of Teachers including their PAN, designation, dept and experience details(Data Template)	View Document
Any additional information	View Document

2.5 Evaluation Process and Reforms

2.5.1 Mechanism of internal assessment is transparent and robust in terms of frequency and mode

Response:

Internal Assessment Tests:

- Internal assessment marks are awarded to the students as per the university norms. For each subject, the maximum marks are 100. Out of 100 marks,

Internal Assessment marks : 20

External Marks : 80

- Three Internal Assessment Tests for **Theoretical courses** each carrying 100 marks are conducted during the semester by the college. The total marks obtained in all the tests put together out of 300, are proportionately reduced for 20 marks and rounded to the nearest integer.
- The internal assessment marks for the **Laboratory courses** is awarded as follows: 75 marks shall be awarded for successful completion of all the experiments and 25 marks for the model exams. The total mark shall be reduced to 20 and rounded to the nearest integer
- In this academic year (2020-2021) assessment tests were carried out in MCQ pattern through online.

- As per the instruction by Anna University, the descriptive type exams have been conducted through on line. The question papers prepared by faculties are sent to the students through Google class room. The students after completing the exam scan the answer scripts and upload the scanned copy in the same Google class room.

To Ensure Transparency:

- The procedure for awarding internal assessment marks is available in university regulations in the Anna University website. The same information is displayed in the notice board of all the departments.
- Three Internal assessment tests (Periodical Tests) are conducted as per the schedule published by Anna University. The circular for the test portion, question pattern and exam schedule are sent to all the class rooms and also displayed in all the department notice boards.
- The answer scripts are evaluated within two days from the date of conduct of the exam. Then the evaluated answer scripts are distributed to the respective students to know their marks. If there is any deviation in awarding marks, it will be immediately clarified and rectified.
- The internal assessment test marks and the attendance of the students are entered in Anna University web portal by the concerned faculty in-charges and the students can access this information through the students' web portal. So the students can come to know their internal assessment marks of every periodical test.
- After entering the third internal assessment test marks, the average of three periodical test marks is reduced to 20 marks for each subject. So, the students will come to know their internal assessment marks for each subject through students' web portal, before they appear for University semester examinations.

Internal Marks Assessment:

- Continuous evaluation of student performance is carried out in laboratories as well as in class rooms. The tools used for continuous evaluation of student performance are as follows:

S.No	Tool	Mode	Frequency
1	Periodical test	ON Line/ Physical	3 per semester
2	Laboratory Experiment	Physical	Weekly once
3	Assignment	ON Line/ Physical	3 per semester
4.	Attendance	ON Line / Manual (Posted in University Web portal)	4 per semester
5	Model practical Examination	Physical	1 per semester
6	Tutorials	Physical	As per curriculum

File Description	Document
Any additional information	View Document
Link for additional information	View Document

2.5.2 Mechanism to deal with internal/external examination related grievances is transparent, time-bound and efficient

Response:

- In order to have a transparent system for examination related grievances, internal and model examinations are conducted by the institution exam cell. The exams are conducted based on the academic calendar. The dates, portions, Time duration all are informed to the student well before the commencement of the Internal Assessment tests.
- Timetable for the examinations and hall allotment are displayed in the notice boards well in advance.

1. **For grievances before Exam**

- For grievances like non-issuance of hall ticket, correction in name, the students can apply to the Principal. Subsequently, Principal forwards the applications to the Examination Cell for necessary action

1. **For grievances during examinations**

- Any discrepancy/doubt in the question paper reported by student during the Internal Assessment Test is communicated to the faculty concerned.

- Students are motivated not to indulge in any type of malpractices. If any student is found to involve in malpractice, then his/her answer booklet is handed over to the exam cell with a report from the hall invigilator. Then a fresh answer booklet is provided to that student and the candidate is allowed to write that examination. Then disciplinary actions are taken on that particular student based on the suggestions provided by the discipline committee.

1. **For grievances after examinations**

- If a student couldn’t attend the internal tests and model exams when he/she represents the institution in any event (on duty), owing to medical grounds or any valid reason, that student will be allowed to write the retest to earn internal assessment marks.
- The answer scripts are evaluated within two days from the date of conduct of the exam. Then the evaluated answer scripts are distributed to the respective students to know their marks. If any grievance is raised by the student, it is resolved by the faculty and the necessary correction in marks is done immediately.
- Any discrepancy in the University exam question paper reported by student is communicated to University after examination.
- The difficulty faced by the students in MCQ pattern online exams have been reported by the parents to the Principal. The Principal has sent the letter to the Controller of Examinations

immediately to take necessary action for the difficulties faced by the students during the online examinations. Due to many issues and complaints received from the students, parents and many colleges, the University has conducted the re-examinations for all the students who failed in MCQ pattern online examinations.

- Students can apply for re-evaluation of their answer scripts within a week from the declaration of results if they are not satisfied with their results. The results of re-evaluation will be announced as per the university norms.
- A student can apply for challenge evaluation within a week after the announcement of the revaluation results. If the student wins the challenge university favors students with proper award of marks and the challenging evaluation fee is refunded to the students.
- This mechanism provides complaint box, class committee meeting, counseling hour, transparent, time bound and efficient dealing of examination related grievances of the students.

File Description	Document
Any additional information	View Document

2.6 Student Performance and Learning Outcomes

2.6.1 Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students.

Response:

The details of Program Outcomes, Program Educational Objectives, Program Specific Outcomes and Course Outcomes for all the programs and the mechanism of communication are explained hereunder.

- Program Outcomes (POs) as given by the NBA is displayed in the prominent places in the HOD and Faculty rooms of all the departments, laboratories and also in the website.

- Program Specific Outcomes (PSOs) are written for each program after thorough discussions and deliberations with stakeholders. The PSOs are also displayed in the prominent places.

- Course Outcomes (COs) are written for each course in every program after discussion amongst the course handling faculty & subject expert. The COs are kept in the course file & uploaded in the respective department website.

- The IQAC reviews the Course Outcomes (COs). The COs are agreed upon by the faculty of the program and should drive towards the POs and PSOs.

- Each Course Outcome is mapped to Program Outcomes in terms of relevance. Three levels of relevance based on degree of correlation are used. The levels of correlation are 1 for low, 2 for medium and 3 for high correlation.

- The contribution of course to each PO is expressed in terms of average relevance of COs mapped to that particular PO. Similarly the value computed for all the courses including first year courses shall be entered for the corresponding PO and PSOs.
-
- Awareness about POs/PSOs & COs is made to students by faculty at the beginning of the semester besides displaying them in the respective departments, and on the college website.

- Course outcomes are communicated to the students through Periodical Test question papers and Lab Manuals. The Course outcomes and CO-PO mapping for each subject prepared by the Faculty concerned are displayed in the notice boards available in class rooms. The students are aware of the course outcomes for each subject and will come to know the mapping of course outcomes with Programme Outcomes.
- The Program outcomes, Course outcomes and CO-PO mapping for each subject are given in the Faculty Log Book.

- The Program outcomes, Program Educational Objectives, Program Specific Outcomes Course Outcomes and CO-PO mapping for each subject are given in the Course files.

- The COs corresponding to each question are mentioned in the Periodical Test Question paper.

- For each programme offered in the department, Programme Educational Objectives (PEOs) and Programme Outcomes (POs) have been formulated. For each course offered in a particular programme, Course Outcomes (COs) are defined.

Places of Disseminations of Program Outcomes, Program Educational Objectives, Program Specific

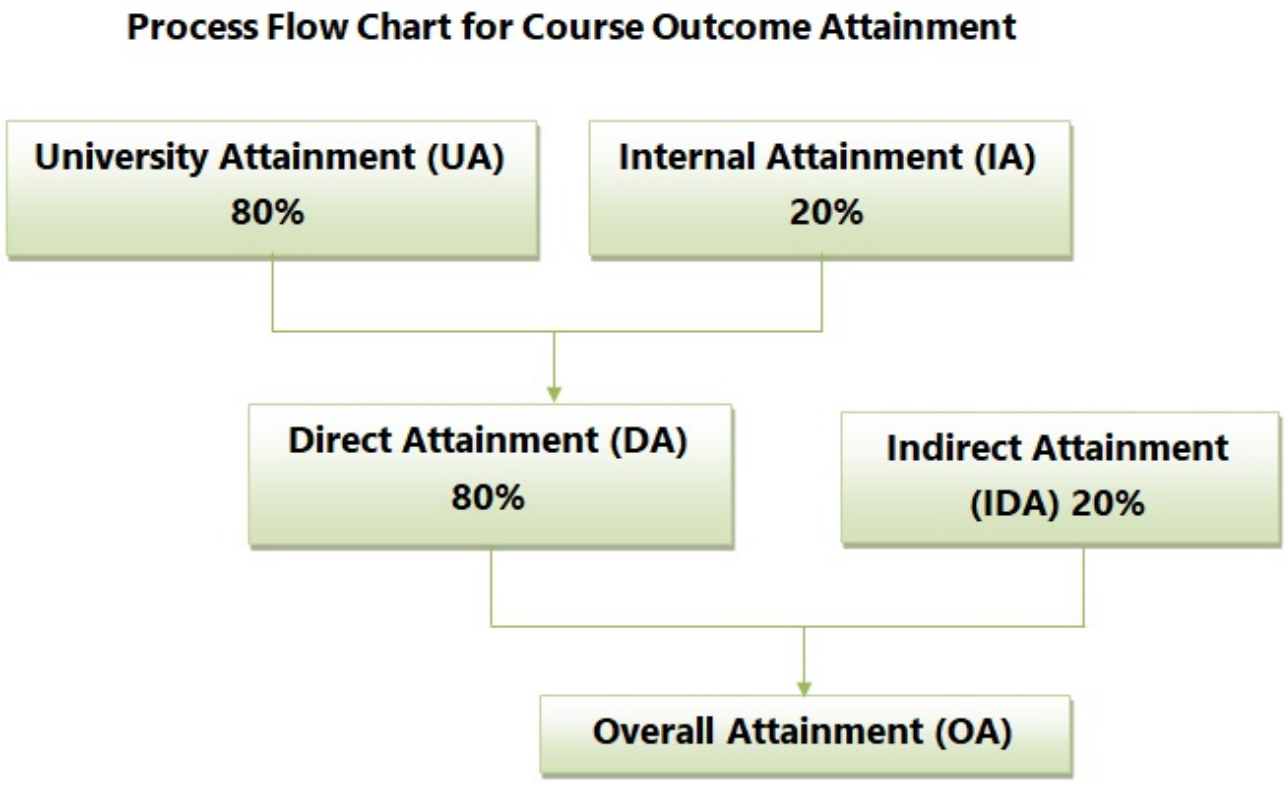
Outcomes and Course Outcomes

S.No	POs/PEOs/PSOs/COs	Places of Dissemination
1.	POs/PEOs/PSOs	HOD and Faculty Cabins
2.	POs/PEOs/PSOs	Departmental Notice Board
3.	POs/PEOs/PSOs	Departmental Laboratories
4.	POs/PEOs/PSOs	College Website
5.	COs	Class Rooms
6.	POs/PEOs/PSOs/COs	Course files
7.	POs/PSOs/COs/ CO-PO Mapping	Log books
8.	COs corresponding to the questions	Internal Assessment Question Papers

File Description	Document
Upload COs for all Programmes (exemplars from Glossary)	View Document
Upload any additional information	View Document
Past link for Additional information	View Document

2.6.2 Attainment of programme outcomes and course outcomes are evaluated by the institution.

Response:



Rubrics for Course Outcome Attainment

The CO assessment for each course is done by individual faculties and assessed by the course coordinator

at the end of the semester. The assessment process has two following tools.

- Direct Tool
- Indirect Tool

Direct Tool:

The direct tools for theory courses are described as below:

- Internal Assessment Marks
- University Examination

The direct tools for laboratory courses are described as below:

- Internal Assessment Marks
- University Examination

Indirect Tool:

The indirect tool for Course Outcome assessment is described as below:

- Course Outcome Survey

At the end of the semester, the feedback to assess the CO is obtained from the students for each course.

Evaluation Procedure:

Theory Courses

Direct Tool Internal Test

- Class average of the students for each test is calculated and target is set just above the class average.
- The attainment level and target levels of each course are fixed as follows:

Attainment Level = 1, if 60% of students secured more than 70%

Attainment Level = 2, if 70% of students secured more than 70%

Attainment Level = 3, if 80% of students secured more than 70%

Direct Tool – University Examination (2017 Regulation)

- The attainment level and target levels of each course are fixed as follows:

Attainment Level = 1, if 50% of students secured B more than B grade

Attainment Level = 2, if 60% of students secured B more than B grade

Attainment Level = 3, if 70% of students secured B more than B grade

Indirect Tool – Course Outcome Survey

- The attainment level and target levels of each course are fixed as follows:

Attainment Level = 1, if the course outcome attainment is more than 60%

Attainment Level = 2, if the course outcome attainment is more than 70%

Attainment Level = 3, if the course outcome attainment is more than 80%

Overall CO attainment

- Internal Direct attainment
- Direct attainment = (0.8 X University Examination Attainment Level) + (0.2 X Internal Direct Attainment)
- Overall Attainment = (0.8 X Direct Attainment) + (0.2 X Indirect Attainment)

Note:

- Exit and Alumni survey on POs are taken from Final and Alumni Students to calculate Indirect PO Attainment.

OVER ALL ATTAINMENT WITH PO MAPPING

PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**

CO										
ME6602/ ME313	3	3	2	2	1	2	2	3	1	
Final PO attainment	**3**	**3**	**2**	**2**	**1**	**2**	**2**	**3**	**1**	

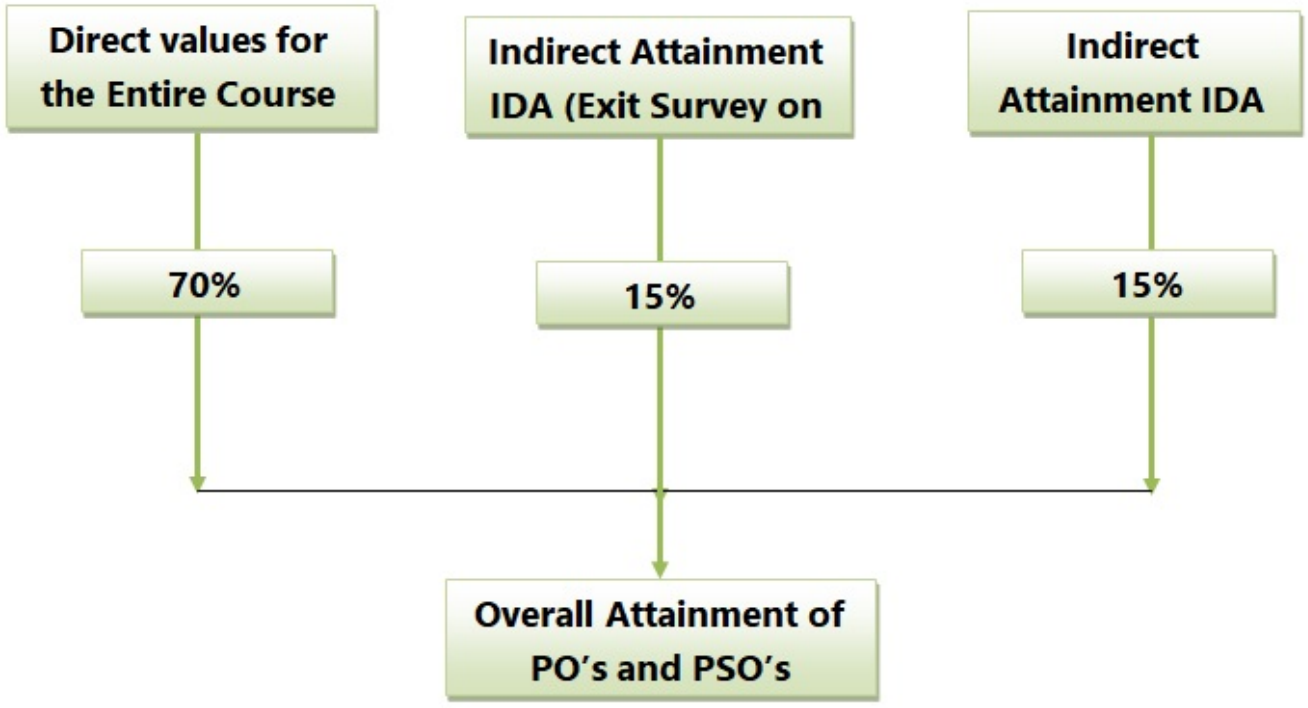
NOTE:

If PO =3, 1 X Overall attainment (OA)

If PO =2, 0.667 X Overall attainment (OA)

If PO =1, 0.33 X Overall attainment (OA)

PROCESS FLOW DIAGRAM FOR THE OVERALL PO AND PSO ATTAINMENT



File Description	Document
Upload any additional information	View Document

2.6.3 Average pass percentage of Students during last five years

Response: 88.12

2.6.3.1 **Number of final year students who passed the university examination year-wise during the last five years**

2020-21	2019-20	2018-19	2017-18	2016-17
264	296	305	333	434

2.6.3.2 **Number of final year students who appeared for the university examination year-wise during the last five years**

2020-21	2019-20	2018-19	2017-18	2016-17
265	311	379	425	499

File Description	Document
Upload list of Programmes and number of students passed and appeared in the final year examination (Data Template)	View Document
Upload any additional information	View Document
Paste link for the annual report	View Document

2.7 Student Satisfaction Survey

2.7.1 Online student satisfaction survey regarding teaching learning process

Response:

File Description	Document
Upload database of all currently enrolled students (Data Template)	View Document
Upload any additional information	View Document