



ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(UGC AUTONOMOUS)

(Affiliated to AU, Approved by AICTE & Accredited by NBA & NAAC with 'A' Grade)

Sangivalasa 531 162, Bheemunipatnam Mandal, Visakhapatnam Dist

DEPARTMENT OF CHEMICAL ENGINEERING

External Audit on the performance of the department (2019-20)

S. No.	Criteria	Max. marks	Self Marks	Evaluator marks
1	Teaching – Learning Processes	300	255	242
2	Student's Performance	200	114.12	114
3	Faculty contributions	250	70.32	70
4	Co-curricular activities	100	80	77
5	Students support systems	85	59	59
6	Continuous improvement	40	20	20
7	Best Practices	25	20	20
	Total	1000	618.44	602

Availability of ATR and Impact analysis / implementation on comments of previous NBA committee/ IA remarks: (Copy may be provided by the departments)

1. Teaching Learning Processes: (Max – 300)

S.No	Description	Max marks	Marks awarded	Remarks
1.1	Initiative for improvement of quality in teaching and learning (95)			
1.1.1	Availability of Academic Calendar of the department based on Institute's academic calendar and its effective compliance / implementation and adherence to schedule	5	5	Academic calendar is present and maintained
1.1.2 (a)	Implementation Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences	5	4	
1.1.2 (b)	Teachers use ICT enabled tools including online resources for effective teaching and learning process	5	4	

1.1.2 (c)	Usage of MOODLE Check apart from Lecture notes availability of quizzes, beyond curriculum contents, students usage, how useful for self learning for 2019-20 and 2018-19	5	5	All the courses are updated in MOODLE
1.1.3	Guidelines to identify weak and bright students(1M); post identification actions taken(2M); impact observed and recorded(2M)	5	4	Remedial classes are conducted for slow learners
1.1.4	Classrooms and seminar halls with ICT- enabled facilities such as smart class, LMS, etc.	5	2	Projector is fitted in only one class room Other two projectors are movable.
1.1.5 (a)	Quality of laboratory experience with respect to conducting, recording observations	5	4	
1.1.5 (b)	Laboratory Evaluation process: Usage of Rubrics for assessment	10	10	All labs are using rubrics for continuous evaluation
1.1.5 (c)	Faculty / Technician explanation in labs (at least 2-3 labs)	5	4	
1.1.6 (a)	Feedback collection and analysis (CRC/ Student feedback)	5	4	
1.1.6 (b)	Actions taken	5	3	
1.1.6 (c)	Impact of action recorded Check action taken exactly matches with the analysis	5	3	
1.1.7	Identification of curricular gaps (5M) Analysis and action taken (5M)	10	4+4	
1.1.8	Average percentage of courses having focus on employability/ entrepreneurship/ skill development offered by the department.	5	5	
1.1.9	Number of value-added courses for imparting transferable and life skills offered and students enrolled If No.of Value added courses > 3 and enrolled students count >50 ---- 5M If 3>No.ofValue added courses <=1 and enrolled students count >25 ---- 3M Else --- 0M	5	3	
1.1.10	Structured feedback for design and review of syllabus (semester wise / year wise) is obtained from 1) Students, 2) Teachers, 3) Employers, 4) Alumni --- 5M Action taken and impact analysis --- 5M	10	8	Feedbacks are available and analysis is in place.
1.2	Quality of end semester examination, internal semester question papers, assignments and evaluation (30)			

1.2.1	Process of internal semester question paper setting, scheme of evaluation and its compliance, existence of committee	5	4	
1.2.2	Question paper validation to ensure desired standard from outcome attainment perspective as well as learning levels perspective (Quality of Q papers) Internal (5) + external (5)	10	10	A monitoring committee is available
1.2.3	Mapping of questions with the Course outcomes, Blooms taxonomy, and indicating the above with percentage wise weightage for last 3 assessment years.	10	10	QPs are mapped with COs and BLs.
1.2.4	Assignments / case studies / seminars to promote self-learning,(for coverage of non-domain POs and also higher levels of Blooms taxonomy) survey of contents from multiple sources, assignment evaluation and feedback to the students, mapping with the COs.	5	4	
1.3	Quality of student projects (30)			
1.3.1	Guide allocation and Projects identification strategies	5	5	Project batch contains all the standards of students
1.3.2	Continuous monitoring mechanism and evaluation system (5M), Usage of Rubrics for project assessment Methodology(Appropriately documented) to assess individual contribution/understanding of the project as well as collective contribution/understanding {Process to assess individual and team performance}(5M)	10	10	Well suited rubrics are followed
1.3.3	Projects classification (application, product, research, review etc.) consideration to factors such as environment, safety, ethics, cost, standards (non –domain factors) and mapping with program outcomes and program specific outcomes. (5M)	5	4	
1.3.4	Quality of journal where the paper has been published /quality of competition in which award has been won for the projects	10	2	
1.4	Industry related interaction (25)			
1.4.1	Industry supported laboratories	5	0	Need to look for any sort of Industrial support.
1.4.2	Industry involvement in the program design and Curriculum.	5	5	
1.4.3	Industry involvement in partial delivery of any regular courses for students	5	2	Need to explore the possibility of industrial persons involvement in delivery of courses
1.4.4	Impact analysis of industry institute interaction and actions taken thereof	5	5	

1.4.5	Industrial /internship /summer training of more than two weeks and post training Assessment	5	5	
1.5	Factors related to Outcome based education (100)			
1.5.1	Explanation of Articulation matrix for CO s and POs and also fixing proper attainment levels of PO, PSO and PEO assessment.(Check faculty awareness)	15	15	CO-PO mapping is available for all courses
1.5.2	Coverage and quality of all direct and indirect assessment tools for POs and PSOs (Such as COs, projects, placements, higher education etc., for direct assessment and recruiter, alumni, employer, parents etc., for indirect assessment). <i>Reasonable sample size is critical for each tool</i>	15	15	
1.5.3	Updating the data of CO / PO/PSO assessment in a time bound manner and action / measures taken and impact	20	20	
1.5.4	Initiatives for faculty and student awareness on OBE (10M) and verification of faculty and student awareness i.e. impact analysis (10M)Physically check	20	15	Students are aware of COs and POs
1.5.5	CO attainment tools based on internal exam evaluation + external examination Procedures followed {Based on assessment on performance of students question wise in both cases}	20	20	
1.5.6.	Action taken on non attainment of POs / Cos	10	6	
1.6	Laboratory facilities (20)			
1.6.1	Maintenance and overall ambience (to check physically whether the equipment is working)	5	5	
1.6.2	Safety initiatives in laboratories (incl Charts)	5	4	
1.6.3	Facilities (additional equipment/ softwares) created for improving the quality of learning.	10	2	Need to improve additional equipment in laboratories

2. Student Performance:(Max-200)

S.No	Description	Max marks	Marks awarded	Remarks
2.1	Success rate(90)			
2.1.1	a) Success rate of students who cleared programme without backlogs in any year of study including lateral entry= $20 \times (\text{Students graduated} / \text{Students admitted})$	20	8.46	
	b) Improvement in success rate from previous years (1M for each percent increase)	5	2	

2.1.2	a) Success rate in any year of study including lateral entry= $15 \times (\text{Students graduated} / \text{Students admitted})$	15	13.557	
	b) Improvement in success rate from previous years (1M for each percent increase)	5	2.5	
2.1.3	Academic Performance in Third Year Academic Performance = $1.5 * \text{API}$ (Academic Performance Index) API = $(3^{\text{rd}} \text{Year Grade Point Average of all successful Students on a 10 point scale} \times \text{number of successful students}) / \text{number of students appeared in the examination}$	15	9.3	
2.1.4	Academic Performance in Second Year {Same as above formula in 2.1.3}	15	7.53	
2.1.5	Academic Performance in First Year { Same as above formula in 2.1.3}	15	5.97	
2.2	Student enrollment ($\geq 90\%$ - 15M; $\geq 80\%$ - 10M; $\geq 70\%$ - 5M; otherwise - 0)	15	0	
2.3	Placement, Higher Studies and Entrepreneurship: $50 \times (\text{students placed} + \text{admitted to higher studies} + 3 \times \text{entrepreneurs}) / (\text{Total students})$	50	39.4	
2.4	Achievements in curricular, co-curricular and extra-curricular activities (45)			
2.4.1	Paper, model presentation etc in International Level (IL), National Level * (NL), State Level (SL) Marks= $2.5 \times (10 \times \text{SPIL} + 5 \times \text{SPNL} + 2.5 \times \text{SPSL}) / \text{TNS}$ SPIL=students participated in International Level SPNL=students participated in national Level SPSL=students participated in state Level TNS= Total number of students in 2 nd , 3 rd and 4 th year	25	5.4	Students participation in conferences and other competitions are to be increased.
2.4.2	Certificate programs or courses like NPTEL/Course-era/Udany etc. attended by students · Participation for 4 weeks : 3 M · Participation for 4 to 8 weeks: 5M · Participation more than 8 weeks: 10 M Assessment = $20 \times \text{Sum of points} / 0.5 \times \text{No. of students}$	20	20	Most of the students are doing NPTEL courses.

*National level (Paper, model presentation etc) conducted in-house is treated as State level

3 Faculty contributions:(Max-250)

S.No	Description	Max marks	Marks awarded	Remarks on non compliance
3.1	Average percentage of full time teachers with Ph.D. Number of available PhDs in the department $\geq 20\%$ - 10M $20\% < \text{Number of available PhDs in the department} < 10\%$ - 5M	10	10	50% of the teachers are doctorates.
3.2	Research Guidance (20)			

3.2.1	Number of Teachers recognized as research guides Score: Number of Teachers recognised as research guides	5	0	<i>Teachers are required to focus to become research guides.</i>
3.2.2	M.Phil / M.Tech./ (1M / candidate)	15	0	
3.2.3	Ph.D. (5 M/ candidate)		0	
3.3	Research projects funded by government and nongovernment agencies during the last five years (45)			
3.2.1	Major (More than 10 lakhs) 15M / project	25	0	Teachers need to spend time on exploring project proposals and consultancy work
3.2.2	Minor (5M/ project)		0	
3.2.3	Patents (10 M/ patent)	10	0	
3.4	Revenue generated from consultancy: More than 2 Lakhs : 10 marks < 2 lakhs: 5 marks	10	0	
3.5	Publications(75)			
3.5.1	Number of books and chapters in edited volumes / books published during the last five years (5M / each chapter)	10	0	No book chapters
3.5.2	Publication in journals: Marks awarded=50 X P/F ? F = number of faculty, P = number of publications P=1xSCI+0.6xWOS+0.6xScopus+0.3xUGC	50	6.67	Need to focus on paper writing.
3.5.3	Bibliometrics of the publications during the last five years based on average citation index in Scopus/ Web of Science or PubMed 1.No. of citations for last 3 years / No. of publications for last 3 year If the percentage ≥ 100 then the marks awarded 5 Marks 2.No. of publications which were cited for last 3 years / No. of papers published for last 3 years If the percentage ≥ 100 then the marks awarded 10 Marks	15	5	
3.6	Papers presented in seminars / conferences(30)			
3.6.1	Marks = 30 x (1.5 x NFPI +0.5xNFPN)/TNF NFPI=number of faculty presented in international seminars/conferences NFPN=number of faculty presented in national seminars/conferences Max: 30M	30	3.75	Teachers are advised to participate in conferences.
3.7	Seminars / Conferences / Workshops / Symposia wherein served as Resource person(10)			

3.7.1	Keynote Speaker / Chairman / Co-Chairman / Distinguished Guest / Key Speaker / Lead Discussant International: 4M/session (max 20) ; National: 2M/session (max 10)	10	0	
3.8	Membership in editorial boards and number of papers reviewed (2.5M / paper)	5	2	
3.9	Membership / executive positions in professional bodies and their related activities(2.5M / activity)	5	2	IICChE and IEI activities can be increased.
3.10	Development activities (product development, instructional materials, working models, charts, monogram etc.) 2.5M/activity	5	2.5	
3.11	Guest lectures delivered by faculty Industry / research institutes / universities 2.5M / lecture	5	5	
3.12	Teachers awarded national / international fellowship and honors for advanced studies/research during 2019-20 (only academic bodies and Govt. Organizations) 2.5M/award	5	0	
3.13	Faculty Qualification $FQ = 1.5x [(10X + 6Y)/F]$ where X is the no. of regular faculty with Ph.D., Y is the no. of regular faculty with M.Tech., F is no. of regular faculty required to comply 1:25 Faculty Student ratio including LE.	15	13.34	
3.14	Faculty participation inonline/ face-to-face Faculty development/training activities/STTPs (Professional Development Programmes, Orientation /Induction Programmes, Refresher Course, Short Term Course). A Faculty scores maximum five points for participation · Participation in 2 to 5 days FDP: 3 M · Participation >5 days FDP: 5M · Assessment = $3 \times \text{Sum of points} / 0.5RF$ where RF is required faculty as per 1:25 ratio	20	20	All teachers are participating in FDPs..

4. Co-curricular activities:(Max-100)

S.No	Description	Max marks	Marks awarded	Remarks on non compliance
4.1	Expert faculty / industrial heads visits From Foreign universities / IITs, NITs /research organizations / companies (5M/ visit), from universities (4M / visit)	15	15	Regular activities are going on

4.2	Number of workshops/seminars/ FDP / STTP conducted for faculty during the last five years.	15	15	Every year a FDP / Workshop is conducted
4.3	Department Journal / News letter / Magazine / Website	5	5	
4.4	Capacity development and skills enhancement activities are organised for improving students capability 1. Soft skills 2. Language and communication skills 3. Life skills (Yoga, physical fitness, health and hygiene) 4. Awareness of trends in technology Student clubs	15	15	
4.5	<i>Alumni association meetings</i>	5	0	Department need to increase its Alumni activities
4.6	<i>Contributions from Alumni</i> (Technical collaboration / employment providers / aid for infrastructure improvement / scholarships)	5	0	
4.7	Number of extension and outreach Programs conducted in collaboration with industry, community and Non-Government Organizations through NSS/ NCC, etc., yearwise during the last five years students participating in extension activities also required	10	10	
4.8	Number of functional MoUs with institutions of national, international importance, other Institutions, industries, corporate houses etc. year wise during last five years (only functional MoUs with ongoing activities to be considered)	5	5	
4.9	<i>Adjunct faculty (Minimum 30 Hrs engagement /semester) (10M / faculty)</i>	10	0	
4.10	Number of awards/medals won by students for outstanding performance in sports/cultural activities at inter-university/state/national / international level (award for a team event should be counted as one) during the last five years.	10	7	
4.11	Presence of an active Student Council & representation of students on academic & administrative bodies/committees of the department	5	5	

5. **Student support systems: (Max-85)**

S.No	Description	Max marks	Marks awarded	Remarks on non compliance
5.1	Mentoring system: Efficacy of the system (5M), impact analysis (10M)	15	15	All students are under the mentorship of faculty.
5.2	Self learning (15)			

5.2.1	Scope for self-learning	5	5	
5.2.2	The facilities provided such as materials for learning beyond syllabus, Webinars, Podcast, MOOCs etc. and demonstrate its effective utilization	10	10	
5.3	Career Guidance, Training, Placement (15)			
5.3.1	Number of students participated by career counseling and guidance for competitive examinations offered by the Institution during the last five years.	5	5	
5.3.2	Number of students benefited by career counseling and guidance for competitive examinations offered by the Institution during the last five years.	5	2	
5.3.3	Number of students Appearing Vs qualifying in state/ national/ international level examinations (eg: IIT/JAM/ NET/ SLET/ GATE/ GMAT/CAT/GRE/ TOEFL/ Civil Services/ State government examinations, etc.)) year-wise during last five years	5	1	Need to motivate the students to write the GATE/ other competitive examinations
5.4	Entrepreneurship Cell (25)			
5.4.1	Subject offered related to Entrepreneurship	5	0	Even though IIC activities are there, the students need to motivate to become entrepreneurs.
5.4.2	Entrepreneurship activities	5	5	
5.4.3	Students benefitted	5	0	
5.4.4	Paper published	5	0	
5.4.5	Innovative projects	5	5	
5.5	Grievance redressal system for the students and action taken	5	5	
5.6	Department library (10)			
5.6.1	No. of Volumes, titles, journals and magazines available in the department library	5	3	Need to look for improvement of department library usage
5.6.2	Usage of department library by teachers and students	5	3	

6. Continuous Improvement (Max-40)

S.No	Description	Max marks	Marks awarded	Remarks
6.1	PO And PSO attainment {2M For Each 1% Increase} 2015-19 batch to 2016-20 batch	8	4	4
6.2	Pass percentage {2M For Each 1% Increase}	8	8	8

6.3	Intake: (Improvement in mean rank in open category- 5M) + (>95% seats filled -5M90-95% seats filled – 3M, and below 90% -0M)	8	0	0
6.4	Student Placements, Higher Studies& Entrepreneurship {1M For Each 1% Increase}	8	8	8
6.5	Faculty Publications {1M For Each 1% Increase}	8	0	0

7. *Innovative / Best practices and their impact (Max-25)*

S.No	Description	Max marks	Marks awarded	Remarks
7.1	Describe the best practices the department claims to have a niche for itself in the areas such as Teaching learning process, community engagement, co-curricular activities, evaluation, feedback system, Student participation in other activities, Alumni activities etc., (which makes the dept unique)	10	10	10
7.2	The impact of such activities	15	10	10

M.V.V. Ch. Lakshmi
21/08/2021

Signature of the evaluator

Name: Prof. M.V.V. Ch. Lakshmi

Designation: Professor

Department: Chemical Engineering

Institute: Andhra University