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EVALUATIVE REPORT

DEPARTMENT OF CHEMICAL ENGINEERING

for

ASSESSMENT AND ACCREDITATION

Submitted to

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

BANGALORE

JAYPEE UNIVERSITY OF ENGINEERING AND TECHNOLOGY
GUNA

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EVALUATIVE REPORT OF THE DEPARTMENT

1. **Name of the Department** : Chemical Engineering (CHE)

2. **Year of establishment** : 2003.

3. **Is the Department part of a School/Faculty of the university?**

JUET is a unitary University. It has departments that include Department of Chemical Engineering.

4. **Names of programs offered**

- Ph.D. - (Full Time/ Part Time)
- PG- M.Tech. - (Chemical Engineering)
- UG- B.Tech. - (Chemical Engineering)
- Diploma - BMCT (Building Materials and Cement Technology) discontinued from 2013.

5. **Interdisciplinary program and departments involved**

- All students of B.Tech. programs have to take several core courses from other departments- Electronics and Communication engineering (ECE), Humanities and Social Sciences (HSS), Computer Science and Engineering (CSE), Mechanical Engineering (ME), Mathematics, Physics, and Chemistry. Beyond these core courses there are many interdisciplinary elective are being offered to these students.

- Following are the number of credits and percentage of courses taken by other departments of the university in programs offered by CHE departments.

Course	Total Credits	ECE		HSS		CSE		ME		Maths		Physics		Chemistry	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
B.Tech.	195	10	5.13	24	12.31	6	3.08	7	3.59	8	4.1	10	5.13	10	5.13

- The department is also involved in the teaching of most of the subjects of M. Tech. - Environmental Engineering.

6. Courses in collaboration with other universities, industries, foreign institutions, etc.

a) With other University

In B.Tech. 3rd year, the students are selected on the merit basis for the final year study at South Alabama University, USA; every year. The selected students do their final year courses including the projects at South Alabama University under the credit transfer scheme.

b) With industries

B.Tech. final year placed students in various companies like APAC Consultant Pvt. Ltd. have to complete their credits for Project Part-2 at the company under the credit transfer scheme. These students need to complete the remaining credits of 8th semester in the university before joining the companies for their Project Part-2.

7. Details of programs discontinued, if any, with reasons

Diploma in BMCT (Building Materials and Cement Technology) was discontinued from 2013 because of recession in the cement industry.

8. Examination System

Semester, along with choice based credit system. Following are the details for evaluation of all type of courses

Examinations

To train the student to put in sustained and disciplined work over the entire period of study, following pattern of examination is being implemented in the university. Some important components of the examination pattern are as given below:-

I. Theory Courses

The university follows the semester systems and accordingly three examinations held in each semester for theory courses. These examinations have a total weightage of 75%; the balance 25% allocated to Assignments, Quizzes, Tutorial, and Regularity in Attendance etc. by the Course Coordinator/ Teacher. Details of examinations and their weightage are as follows:-

a) Theory Tests/Examinations

Three types of tests/examinations held in each semester as specified in previous section. Types of tests/examinations are as under:-

(i) Test-1 or T-1
(ii) Test-2 or T-2
(iii) Test-3 or T-3

b) Weightage of marks, duration & Syllabus for theory test/examination Allotment of weightage of marks i.e.75% of total & Syllabus, duration, marks for each Tests/Examination will be as under:-

Allotment of marks:

Tests/Exams	T-1	T-2	T-3
Percentage of marks	15	25	35
Duration in Hours	1	1 ½	2

Syllabi Coverage:

The syllabus for each test is course contents covered up to the last day of teaching before the examination.

c) Allotment of remaining weightage of marks i.e. 25% of total.

Remaining weightage of marks i.e. 25% including 5% of attendance awarded by respective course coordinator in each theory course through the individual events i.e. Assignments, Tutorials, Quizzes, Regularity & Punctuality in class attendance on the basis of entire semester performance of the individual student.

II. Practical Courses

The evaluation of Practical / Laboratory / Sessional / Workshop work are based on the following:-

a) Day to day work 70%
   a. Attendance and discipline in laboratory (15%)
   b. Quantity & Quality of Experiments Performed, Learning laboratory skills and handling laboratory equipment, Instruments, gadgets, components, materials and software etc. (40%)
   c. Laboratory record (15%)

b) Mid-Semester lab-viva voce / test (P-1) 15%
c) End Semester lab - viva voce / test (P-2) 15%

III. Evaluation for Projects Courses

Project courses shall be run in the final year of B.Tech. & M.Tech. only i.e. in the pre-final semester and final semester each, under the guidance of a Supervisor appointed for individual student or a group of students, and separate evaluation will be done in each semester.

The following evaluation scheme will be followed in each semester while evaluating and awarding grades:

a)	Day to day work	35% awarded by the Supervisor(s)
b)	One Mid-Term Seminar by the students on the project work	15% awarded by a panel of examiners
c)	One Viva-Voce Examination between Test T-2 and Test T-3	15 % awarded by a panel of examiners
d)	Project Report	15% awarded by the supervisor (s)
e)	Final Viva-Voce/ Defense/ Dissertation	20% awarded by a panel of three teachers including Supervisors. In case of M. Tech. Programs, External examiner being a part of the panel

9. Participation of the department in the courses offered by other departments

The Department offer following courses in the B. Tech. / M. Tech. programs of other departments:

Beneficiary Department	Course Name
All Branches of B. Tech. programs	Environmental Studies
B. Tech. Mechanical Engineering	Design of Heat Exchangers
B. Tech. Mechanical Engineering	Measurement and Control
M. Tech. Environmental Engineering	Environment and Development
M. Tech. Environmental Engineering	Solid and Hazardous Waste Management
M. Tech. Environmental Engineering	Air & Noise Pollution: Monitoring and Control
M. Tech. Environmental Engineering	Wastewater Treatment
M. Tech. Environmental Engineering	Environmental Impact Assessment and Audit
M. Tech. Environmental Engineering	Modeling and Simulation in Environmental Systems
M. Tech. Environmental Engineering	Pollution Monitoring Lab
M. Tech. Environmental Engineering	Absorption and Adsorption Processes

10. Number of teaching posts sanctioned, filled and actual (Professors/Associate Professors/Asst. Professors/others)

Positions		Sanctioned	Filled	Actual (including CAS & MPS)
Professor		0	2	
Associate Professors		0	1	
Assistant Professors	G-I	2	0	
	G-II		1	
	SG		1	
Teaching Assistants*			1*	

*Full time Ph.D./M.Tech. Students

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance-

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D./ M.Phil. students guided for the last 4 years
Prof. N. J. Rao	Ph.D.	Vice-Chancellor	Environmental Systems, Pulp and Paper, Fluidization Engineering	46	Ph.D. Supervision- Completed: 02 Ongoing: Nil M.Tech. Guidance- Completed: Nil
Prof. Narendra Nath Dutta	Ph.D.	Professor and HOD	Membrane and Adsorptive Separation Processes	40	Ph.D. Supervision- Completed: Nil Ongoing: 03 M.Tech. Guidance - Completed: 01
Dr. Govind Kumar Agarwal	Ph.D.	Associate Professor	Heterogeneous catalysis	27	Ph.D. Supervision- Completed: 01 Ongoing: 01 M.Tech. Guidance- Completed: 02
Dr. Kaushal Naresh Gupta	Ph.D.	Assistant Professor (SG)	Adsorptive Separation Processes	15	M.Tech. Guidance - Completed: 02

Mr Rahul Shrivastava	M. Tech.	Assistant Professor (G-II)	Fault Detection in Chemical / Biochemical processes	12	M.Tech. Guidance - Completed: Nil

12. List of senior Visiting Fellows, adjunct faculty, emeritus professors

S. No.	Name	Designation	The type of activity the expert was engaged and the research benefit to department.
	Senior Visiting Fellows		
1	Prof. K. K. Tiwari	Former Professor and Head, Department of Chemical Engineering, ICT, Mumbai	Lectures and Workshop for faculty development in the field of Advanced Separation Processes. Guided and helped research scholars of the department. Also assisted the B. Tech. final year students in their design projects throughout his tenure.
2	Prof. S. Palanki	South Alabama University, USA.	Workshop for faculty development in the area of Numerical Methods. Also helped faculty members in their research work especially in the field of Modeling and Simulation.
3	Prof. V. V. Mahajani	ICT, Mumbai	Workshop for faculty development in the field of Advanced Separation Processes.
4	Prof. V. G. Pangarkar	ICT, Mumbai	Workshop for faculty development in the field of Advanced Separation Processes.

13. Percentage of classes taken by temporary faculty-programme-wise Information

Nil

14. Programme-wise Student Teacher Ratio

- For the B.Tech. program the student teacher ratio is 10 : 1

15. Number of academic support staff (technical) and administrative staff: sanctioned, filled and actual

	Sanctioned	Filled	Actual
Technical	4	4	4
Administrative	Centrally managed at University level		

16. Research thrust areas as recognized by major funding agencies

The department has so far not received any funding from any sponsoring agency. But the efforts are continuously being made in this direction to get the funding.

Following are the research thrust areas of the department:

- **Membrane and Adsorptive Separation Processes**

  Application of membrane and adsorptive separation processes for separation and purification of industrial products like pharmaceuticals and recovery of valuables from industrial waste has been studied. Attempts are being made to generate EBR from agencies like DST and DBT. Substantial expertise has already been developed in this area.

- **Environmental Systems**

  Volatile Organic Compounds: Despite of huge technological advancement air pollution is one of the major problems in the today's world. VOCs have recently received greater attention in the field of environmental control due to its primary as well as secondary harmful effects on ground air quality and human health. Hence there is need to control them. There are various techniques available for the control of VOCs like adsorption, catalytic oxidation, condensation and various hybrid techniques etc.

  Dye removal: Several studies on removal of dyes from Industrial waste water by adsorption have been carried out which finally led to publications in journals as well as in conferences.

  Resource recovery from Industrial waste: Recovery of metals from e-waste and spent catalyst by membrane and adsorptive techniques.

- **Heterogeneous Catalysis**

  Catalytic oxidation of carbon-monoxide is one of the most important reactions in the control of air pollution caused by automotive exhaust. The Catalysts currently used in automobiles are precious metals (Pt, Pd & Rh). However, due to high cost and scarcity of these metals, copper-chromite catalysts, a cheaper substitute to noble metals has been prepared in the laboratory by a new method. The novel catalysts exhibit comparable activity to those of noble metals based CO oxidation catalysts.

Photo catalysis: Polymer supported TiO_2 floating catalyst, synthetic preparation and characterization of TiO_2 supported catalyst. The catalytic efficiency for degradation of dye from textile waste water.

- **Fault Detection and Diagnosis in Chemical / Biochemical Processes**

  In order to achieve maximum productivity, to reduce product rejection rate and to satisfy safety and environmental regulations there has been great interest in the development of fault detection and diagnosis (FDD) methods. In past decades, different methods have been developed to detect and diagnose faults in complex systems. FDD approaches can be roughly divided into two major categories: model based methods and process history based methods. Working on process history based methods for developing FDD in chemical and biochemical processes, because plants are becoming more heavily instrumented, resulting more data becoming available for use in detecting and diagnosing faults.

- **Modeling and Simulation**

  Modeling particle distribution in supercritical anti-solvent process.
  Black liquor droplet dynamics in Chemical Recovery Boiler: Experimental and modeling studies on black liquor dynamics have been performed.
  Solvent diffusion in polymers: Diffusion models analyzed from Flory-Huggin's theory for understanding drying mechanism of polymeric films useful as coating materials
  Modeling and simulation of fixed bed adsorption column: For design of fixed adsorption column for removal of volatiles from industrial waste streams and dyes from textile mill waste stream, column breakthrough investigated through a simulation and modeling exercises. Future studies are being focused on Simulated Moving Bed Adsorption of Biomolecules.

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise.

Not yet

18. Inter-institutional collaborative projects and associated grants received

a)National collaboration b) International collaboration

The department has so far not received any grant formally for collaborative research. However currently one of the faculty members of the department is working in collaboration with the faculty member of other university for supervising doctoral research.

I. National collaboration (without grants/funds)

S. No	Faculty name	Research Collaborator affiliation	Research Area	Outcome of Collaboration
1	N. N. Dutta	Dr. G. Vijay Kumar JUIT, Waknaghat	Industrial Biotechnology	Academic
2.	N. N. Dutta	Mrs. S. Hazarika CSIR-NEIST Jorahat, Assam	Biomolecules from natural feedstock.	Research Collaboration

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received.

Not yet

20. Research facility / centre with

- State recognition : Not yet
- National recognition : Not yet
- International recognition: Not yet

21. Special research laboratories sponsored by / created by industry or corporate bodies

Not yet

22. Publications:

I. Summary Report

Category	Total Publications					
	2010	2011	2012	2013	2014	2015
International Journals (Scopus/SCI)	Nil	Nil	1	6	5	5
International Journals (Others)	Nil	3	8	7	1	Nil
National Journals (Scopus/SCI)	Nil	Nil	Nil	1	Nil	Nil
National Journals (Others)	Nil	Nil	Nil	Nil	2	Nil
International Conferences	1	Nil	1	3	1	Nil
National Conferences	3	6	3	5	7	Nil

Category	Total publications
International Journals	17+ 19 = 36
National Journals	1+2 =3
International Conferences	6
National Conferences	24

II. Other Publications

Category	Numbers
Monographs	Nil
Chapters in Books	Nil
Edited Books	Nil
Other Books with ISBN	4

III. Journals Indexed in SCOPUS/SCI/Others

Category	SCOPUS	SCI	Others	Total
International	17		19	36
National	1		2	3

IV. Citation Index:

Indexing parameter	Details
Google citations	Total citations:21 Range : NA Average : 0.6
SNIP	Range : 1.459-2.128 Average 0.102
SJR	Range : 0.28-1.5 Average : 0.087
Impact Factor	Range : 0.6-3.91 Average : 0.26
H-index	Range : 10-136 Average : 8.31

Details of Publications are given in Annexure-I/CHE.

23. Details of patents and income generated

Not yet

24. Areas of consultancy and income generated

Not yet received

25. Faculty selected nationally / internationally to visit other laboratories / institutions / industries in India and abroad

Most of the faculty members (nearly 90%) of the department have visited laboratories, institutions, and industries in India and abroad. Details of faculty members visit in India and abroad given in Annexure-II/CHE.

26. Faculty serving in a) National committees b) International committees c) Editorial Boards d) any other (please specify)

Some of the faculty members of the department are members of one or the other various sub-committees for organization of various conferences/seminars/workshops organized in the University. Details of the faculty members serving in editorial boards of various journals and involved in other activities are given in Annexure- III/CHE.

27. Faculty recharging strategies (UGC, ASC, Refresher / orientation programs, workshops, training programs and similar programs).

To recharge the faculty, department organizes workshop, seminars, expert talks, conferences, refresher courses, faculty development program etc. in University. In addition, the faculty members are also participating in these activities outside the University. The faculty recharging activities organized in the department are as follows:

- Staff Development Program on Advanced Separation Processes, December 13 – 18, 2010.
- IUCEE (Indo-US Collaboration for Engineering Education) Workshop 2011 on Numerical Methods, July 4 – 7, 2011.
- IUCEE Workshop 2012 on Renewable Energy, June 4 – 8, 2012 in collaboration with Mechanical Engineering Department.

28. Student projects

- Percentage of students who have done in-house projects including inter-departmental projects : 95%
- Percentage of students doing projects in collaboration with other universities / Industry / institute: Around 5%

29. Awards/recognitions received at the national and international level by

- **Faculty**

Name of Faculty	National and international recognition
Hari Mahalingam	Rahul Kumar, Hari Mahalingam and K. K. Tiwari got best paper award " Selection of Solvent in Supercritical Antisolvent Process", 5th International Conference on Chemical, Biological and Environmental Engineering (ICBEE2013), New Delhi, India, September 14-15, 2013.

- **Doctoral / post doctoral fellows :** Not yet

- **Students**

Name of students	Detail of research award
Anmol Tandon (B. Tech. student)	Awarded the first prize in a Tech Fest Kshitij 2015 held at I. I. T. Kharagpur
Chitresh Bhargava (B. Tech. student)	IIChE Award for the Year 2015 : The Chemical Weekly Prize for Best Research Paper Published in a High Impact Factor International Journal by an Undergraduate Chemical Engineering Student.

30. Seminars/Conferences/Workshops organized and the source of funding (national / International) with details of outstanding participants, if any.

S. No.	Details
1.	Staff Development Program on Advanced Separation Processes, December 13 – 18, 2010. Funding Agencies**:** JUET.
2.	IUCEE Workshop 2011 on Numerical Methods, July 4 – 7, 2011. Funding Agencies: JUET and IUCEE
3.	IUCEE Workshop 2012 on Renewable Energy, June 4 – 8, 2012 in collaboration with Mechanical Engineering Department. Funding Agencies: JUET and IUCEE
4.	Workshop on Process Simulation using CHEMCAD and MATLAB, December 20-21, 2014. Funding Agencies**:** JUET.
5.	National Conference on Environmental Sustainability and Society: The Growing Paradigm Shift (ESS -2013), March 30-31, 2013 in collaboration with Civil Engineering Department. Funding Agencies**:** JUET.

31. Code of ethics for research followed by the departments

The Department follows the University code of research ethics.

32. Student profile programme-wise:

Name of the Program (refer to question no. 4)	Applications received *	Selected		Pass percentage	
		Male	Femal	Male	Female
B.Tech.					
2006-2010	******	21	8	21(100)	8(100)
2007-2011	22229	33	1	33(100)	1(100)
2008-2012	32017	16	13	16(100)	13(100)
2009-2013	31210	35	13	34(97.14)	13(100)
2010-2014	26150	44	10	41(93.18)	10(100)
2011-2015	******	55	07	55 (100)	7(100)
M.Tech.					
2010-2012	5	3	2	3(100)	2(100)
2011-2013	4	4	0	4 (100)	-
2012-2014	4	1	3	1(100)	3(100)
2013-2015	5	1	1	1(100)	1(100)
Diploma					
2007- 2010	*******	7	0	7(100)	-
2008-2011	*******	31	0	31(100)	-
2009-2012	*******	30	1	30(100)	1(100)
2010-2013	*******	33	3	33(100)	3(100)
2011-2014	*******	35	1	33(94.28)	1(100)
2012-2015	*******	31	1	29(93.54)	1(100)
Ph. D.					
Up to 2015	*******	4	1	Nos. awarded:	2(2M, 0F)
				Nos. Continuing:	3(2M, 1F)
				Nos. Discontinued:	Nil

*Total number of applications received in the University for Admission.

33. Diversity of students

Name of the Programme	Total	% of students from the same university	% ofstudents from other universities within the State	% of students From universities outside the State	% of students from other countries
B.Tech.					
2010	53	NA	37.73	62.27	Nil
2011	64	NA	42.18	57.82	Nil
2012	38	NA	65.78	34.22	Nil
2013	19	NA	31.57	68.43	Nil
2014	5	NA	40	60	Nil
2015		NA			Nil
M.Tech.					
2010	5	Nil	100	Nil	Nil
2011	4	100	Nil	Nil	Nil
2012	4	Nil	0	100	Nil
2013	2	50	Nil	50	Nil
2014	Nil	-	-	-	-
2015	Nil	-	-	-	-
Ph. D.					
2010	Nil	-	-	-	-
2011	Nil	-	-	-	-
2012	Nil	-	-	-	-
2013	Nil	-	-	-	-
2014	Nil	-	-	-	-
2015	1	100	Nil	Nil	Nil

34. How many students have cleared Civil Services and Defense Services examinations, NET, SET, GATE and other competitive examinations? Give details category-wise.

GRE: Around 6 (batches who appeared in these exams in last 5 years).
CAT/MAT/XAT/GMAT: Around 5 (batches who appeared in these exams in last 5 years).
GATE: Around 8.
Civil Services, Defense Services, Central Govt., and PSU Examinations: Around 3.

35. Student progression

<table>
<tr><th>Student progression</th><th colspan="2">Percentage against enrolled</th></tr>
<tr><td>UG to PG</td><td colspan="2">5%</td></tr>
<tr><td>PG to M.Phil.</td><td colspan="2">Nil</td></tr>
<tr><td>PG to Ph.D.</td><td colspan="2">Around 20%</td></tr>
<tr><td>Ph.D. to Post-Doctoral</td><td colspan="2">Nil</td></tr>
<tr><td rowspan="7">Employed
• Campus selection (2010 – 2015)</td><td>Year</td><td>Percentage</td></tr>
<tr><td>2010</td><td>73.08</td></tr>
<tr><td>2011</td><td>146.15</td></tr>
<tr><td>2012</td><td>82.61</td></tr>
<tr><td>2013</td><td>97.37</td></tr>
<tr><td>2014</td><td>109.76</td></tr>
<tr><td>2015</td><td>71.7</td></tr>
<tr><td>Other than campus recruitment</td><td colspan="2">Approx. 20%</td></tr>
<tr><td>Entrepreneurs</td><td colspan="2">0.5%</td></tr>
</table>

36. Diversity of staff

For Ph. D., percentage is calculated out of total Ph.D. degree holders and percentage of UG and PG is calculated out of total strength of the Department.

Percentage of faculty who are graduates	PG	Ph. D.
Of the same university	Nil	33.3%
From other universities within the State	Nil	Nil
From universities from other States	100%	66.7%
From universities outside the country	Nil	Nil

37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period

- Three faculty members have been awarded Ph.D.
- The details of the faculty members who have been awarded Ph.D. are given below

S. No.	Name of Faculty	Area of Research	Year of Degree awarded	University
1	Dr. Kaushal Naresh Gupta	Adsorption of Volatile Organic Compounds on Granular Activated Carbon	2012	JUET, Guna
2	Dr. Alok Gautam	The attachment of bubbles to rough composite particles	2013	University of Newcastle, Australia
3	Dr. Shina Gautam	Detachment of particles from bubble in a turbulent flow	2013	University of Newcastle, Australia

38. Present details of departmental infrastructural facilities with regard to

a) **Library:** Department uses the facility of Learning Resource Centre (LRC) available centrally. In addition to this a Departmental Library is also available.

b) **Internet facilities for staff and students:** JUET campus is fully connected through LAN/ Wi-Fi arrangement consisting of around 3500 node. Internet facility is available 24 X 7 on all theses nodes through 1Gbps leased line. On this network 855 Desktop Systems are made available to faculty members and staff members. Other nodes are available for connections of personal computing devices by faculty members/staff/students.

c) **Total number of class rooms:** 13 Lecture Theater and 30 Class Rooms/Tutorial rooms of the University are shared with other departments.

d) **Class rooms with ICT facility:** 13 Lecture Theater and 6 Class Rooms/Tutorial rooms with ICT facility are with other departments. The detail information is mentioned in Section 4.3.7.

e) **Students' laboratories:**

Laboratory details

Laboratory Name	Location	LAN	PC	Power backup	Capacity	E-Display Board	White Board
Heat Transfer Lab-I	Raman Bhawan	Y	N	Y	30	N	Y
Heat Transfer Lab-2	Raman Bhawan	Y	N	Y	30	N	Y
Mass Transfer Lab-1	Raman Bhawan	Y	N	Y	30	N	Y
Mass Transfer Lab-2	Raman Bhawan	Y	N	Y	30	N	Y
Solid Fluid and Mechanical Operations Lab	Raman Bhawan	Y	N	Y	30	Y	Y
Chemical Reaction Engineering Lab	Raman Bhawan	Y	N	Y	30	N	Y
Environmental Engineering lab	Raman Bhawan	Y	Y	Y	30	N	Y
Instrumentation and Process Control Lab	Raman Bhawan	Y	N	Y	30	N	Y
Modeling and Simulation Lab	Raman Bhawan	Y	Y	Y	30	N	Y

f) **Research laboratories:**
Department has one research laboratory equipped with sophisticated analytical equipment like Gas chromatograph which is used for analysis.

39. List of doctoral, post-doctoral students and Research Associates

I. From the host institutions/universities

- **Doctoral Degree (Awarded)**

  1. Dr. Kaushal Naresh Gupta
  2. Dr. S. Ramesh

- **Doctoral Degree (Pursuing)**

  1. Mr. Rahul Kumar
  2. Mr. Rahul Shrivastava
  3. Ms. Sushmita Sharma

II. From other institutions/universities

- Doctoral Degree (Awarded)

  1. Dr. Alok Gautam
  2. Dr. Shina Gautam

40. Number of post graduate students getting financial assistance from the university.

The details of number of Ph. D./ M.Tech. students getting financial assistance from the university are as follows

Year	Program	No. of students	Total Students
2010-2011	M. Tech.	5	5
	Ph. D.	Nil	
2011-2012	M Tech	Nil	Nil
	Ph D	Nil	
2012-2013	M Tech	3	3
	Ph D	Nil	
2013-2014	M Tech	2	2
	Ph D	Nil	
2014-2015	M Tech	Nil	Nil
	Ph D	Nil	
2015-2016	M Tech	Nil	1
	Ph D	1	

41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology.

The emerging trends in industry, research, government policies, recommendations of the professional bodies, and JUET management's directives motivate and guide the department to design new programs. Renowned academicians from many leading institutes and industry professionals are consulted while conceptualizing and designing new programs or revising the curricula of existing programs. All the faculty members are requested to give their suggestions and finally the meeting of the board of studies including external experts is held for reviewing the curriculum. For example, following external experts have provided their suggestions and feedback for the ongoing curriculum exercise for designing new curriculum for B.Tech./M.Tech. (CHE) programs:

- Prof. K. K. Tiwari, Former Head and Professor, ICT, Mumbai.
- Mr. Alok Joshi, Joint President, Jaypee Rewa Plant, Rewa
- Mr. A. K. Lahiri, DGM, NFL, Vijaipur.
- Mr. Praveer Kumar, GAIL Vijaipur

42. Does the department obtain feedback from

a. Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Yes, the feedback is taken through regular discussions, meetings and emails.

b. Students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?

The feedback from the students is taken at the end of each semester and the remarks are conveyed to the concern faculty for corrective action.

c. Alumni and employers on the programmes offered and how does the department utilize the feedback?

The department keeps a regular contact with the alumni. A large number of alumni, students and faculty members are connected with each other through social media. Often the faculty also meets the recruiters to get their feedback on students' performance. Their feedback helps us in formulating and evolving our corrective strategies. The impact of our response to such feedback can be gauged from the fact that over the years, gradually the number of our students getting selected for high quality technical jobs has increased significantly.

43. List the distinguished alumni of the department (maximum 10)

S. No.	Year of Passing from JUET, Achievements and current affiliations
1	Amrit Singh Khanuja, 2007 Manager, SRF Chemicals
2	Charu Duggal, 2007 HUL Research Centre
3	Deep Rana, 2007 JSW Phillipines
4	Samar Sharma, 2008 Holtec Consulting, Delhi
5	Kumar Prashant, 2009 Process Consultant, London, U. K.
6	Supriya S, 2013 U Missouri Rolla
7	Chitresh Bhargava, 2015 Ph. D. Program, IITB- Monash University

44. Give details of student enrichment programmes (special lectures / workshops /seminar) involving external experts.

Following are the details of workshop organized in the department in which the student participated and benefited by external expert:

- Series of lectures were delivered by Prof. S. Palanki of U.S to the Chemical Engineering 6th semester students.
- In Tech fests i.e. Ionize2K13 and Ionize 2K14, special lectures were taken by an external expert from I.I.T. Mumbai

45. List the teaching methods adopted by the faculty for different programmes.

- Interactive lectures using various aids e.g., Black/White board, computer presentation, Visualizer, etc.
- Small group tutorials and Assignments
- Laboratories
- Project based learning by assigning experimental projects to the students which enable them to think beyond their text books.
- Industrial internship
- Use of online educational resources as supplements

- Participation in Conference, Guest lectures, and industry conducted workshops
- Collaborative Teaching and Learning
- Cross-level peer mentoring
- Partially Flipped Classroom and Guided Reading
- Report writing and Seminars
- 24x7 academic connectivity of faculty with class using social media and other web services

46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?

The department continuously monitors and ensures that programme objectives are met and learning outcomes are achieved through following methods:

I. Continuous evaluation of students' progress through their performance in
   a. Written exams
   b. Assignments
   c. Projects
   d. Presentations
   e. Reports

II. Feedback from the recruiters and employers

III. Feedback from the alumni

The achievements of the programme objectives are reflected through the following:

a. Performance in internal as well as external competitions including online ranking.

b. Acceptance of students in higher education programs at world's top universities including IITs and IIMs.

c. Acceptance of M.Tech. students as Ph.D. scholars and/or as faculty members at IIT, NIT, and Top university in India and abroad.

d. A good number of publications with students as co-authors.

47. Highlight the participation of students and faculty in extension activities.

Faculty and students of the department are actively involved in various extension activities organized by JUET. Details are given in section 3.6 of Self Study Report of the University.

48. Give details of "beyond syllabus scholarly activities" of the department.

- Conducting conferences, workshops, seminars, and Faculty Development Programs.
- Conducting expert lectures in various emerging areas.
- Participation of the faculty in conferences/workshops/seminars etc.
- Organization of several technical events for students
- Helping students in arranging internships, especially for M.Tech. students.

Details are mentioned in Section 30 of this document.

49. State whether the programme/ department is accredited/ graded by other agencies? If yes, give details.

Not yet

50. Briefly highlight the contributions of the department in generating new knowledge, basic or applied.

The department has contributed new knowledge by developing new techniques for the following:

- Control of volatile organic compounds
- Bio-separations
- Photo catalysts for environmental remediation
- Black liquor recovery boiler modeling

The above contribution is reflected in the publications and theses produced by the department.

51. Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.

Strengths:

- In a short span of time department has developed well equipped sate of the art laboratories.
- Experienced people from industries are invited to evaluate final year project and give direct feed back to students.
- Well qualified and experienced faculty with Ph.D's from recognized institutions such as IITs etc.
- Premium department in the state of Madhya Pradesh for Chemical Engineering.
- Good collection of books and journals.
- Regular interaction with nearby industries like GAIL and NFL.

Weaknesses:

- Needs to improve the student enrolment in B.Tech. and M.Tech. courses.
- Need to get project funding from various sponsoring agencies.
- Need to improve the placement in core companies.
- Need of more analytical equipment for research.
- Need to develop strong thrust areas of research.

Opportunities:

- Provide consultancy services to nearby industries like GAIL and NFL.
- Conduct workshops on Chemcad and Matlab for students of nearby engineering colleges.
- Develop expertise in core/emerging areas with
- Establish collaboration with overseas institutes/agencies as well as with Indian institution.
- Imparting entrepreneurship development program for small/medium scale industries for rural development.

Challenges:

- Remote location.
- Increase the diversity of students.
- Faculty retention.
- Awareness of importance of Chemical Engineering in the present context (developing nation).
- Creating interdisciplinary teaching/research environment.

52. Future plans of the department.

- Provide better opportunities for our faculty and students to engage in professional consultancy services to the government sectors.
- To promote inter disciplinary research.
- Collaboration with more Foreign Universities
- Involve student in more practical challenges i.e. solving some real world problem as currently it is limited to pseudo-challenges being organized at technical fest in majority of Indian colleges.

Annexure-I/CHE

List of Publications

International Journal Publications

Scopus Indexed Journals

2015

1. K.N. Gupta, N.J. Rao and G. K Agarwal, "Gaseous phase adsorption of volatile organic compounds on granular activated carbon", Chemical Engineering Communications, Volume 202, Issue 3, pp. 384-401, March 2015. [**Citation Index**:., **SNIP:** ., **SJR:.**, **Impact Factor:** 0.6, **H-Index:**.,]
2. S. Singh, P.K. Singh and H. Mahalingam, "A novel and effective strewn polymer-supported titanium dioxide photocatalyst for environmental remediation", Journal of Materials and Enviromental Science, Volume 6, Issue 2, pp. 349-358, February 2015. [**Citation Index**: N.A., **SNIP:** N.A., **SJR:** 0.28, **Impact Factor:** 1.21, **H-Index:** 10]
3. K.Tiwari, S.Agarwal, and R. K. Arya, "Generalized Pinch Analysis Scheme Using MATLAB", Chemical Engineering & Technology, Volume 38, Issue 3, pp. 530 – 536,February 2015. [**Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:** , **H-Index:**]
4. R. K. Arya and C. K. Bhargava**,** "Drying of Ternary Polymeric Solution Coatings – Comparative Simulation Study", Progress in Organic Coatings, Volume 78, pp. 155 – 167, 2015. [**Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:]**
5. C. K. Bhargava and R. K. Arya, "Design of Binary Polymeric Coatings for Minimizing the Residual Solvent Part I: Experimentation", Drying Technology, Volume 33, Issue 1, pp. 92 – 102, 2015. **Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:]**

2014

6. S. Singh, P.K. Singh and H. Mahalingam, "Novel floating Ag+-doped TiO_2/PS photocatalysts for treatment of dye wastewater", Industrial Engineering Chemistry Research, Volume 53, Issue 42, pp. 16332-16340, October 2014. [**Citation Index**: N.A., **SNIP:** 1.459, **SJR:** 1.01, **Impact Factor:** 2.235, **H-Index:** 135,]

7. A.Sharma, A. Sharma and R. K. Arya, 2014, "Removal of Mercury(II) Ions from Aqueous Solution – A Review of Recent Work", Separation Science & Technology, Accepted on 14 September 2014, DOI: 10.1080/01496395.2014.968261. **[Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:,]**

8. U. M. Singhal, R. Dixit and R. K. Arya, "Drying of Multilayer Polymeric Coatings Part I: An Experimental Study", Drying Technology, Volume 32, Issue 14, pp. 1727 – 1740, 2014. **[Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:,]**

9. R. K. Arya, "Measurement of Concentrations in Thin Film Binary Polymer-Solvent Coatings Using Confocal Raman Spectroscopy: Free Volume Model Validation",Drying Technology, Volume 32, Issue 8, pp. 992 – 1002, 2014.[**Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index: ,]**

10. B. K. Nandi and S. Patel, "Removal of brilliant green from aqueous solution by electrocoagulation using aluminum electrodes: Experimental, kinetics and modeling, Separation Science and Technology, Volume 49, pp. 601-612, 2014. [**Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:]**

2013

11. S. Singh, H. Mahalingam and P.K. Singh, "Polymer-supported Photocatalysts for Environmental Remediation: A review", Journal of Applied Catalysis A: General, Volumes 462-463, pp. 178-195, December 2013.[**Citation Index**: 21, **SNIP:** 2.128, **SJR:** 1.5, **Impact Factor:** 3.910, **H-Index:** 136,]

12. R. K. Arya, "Finite Element Solution of Coupled-Partial Differential and ordinary Equations in Multicomponent Polymeric Coatings", Computers and Chemical Engineering, Volume 50, Issue 5, pp. 152-183, March 2013. **[Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:]**

13. R. K. Arya and M. Vinjamur, "Measurement of Concentration Profiles Using Confocal Raman Spectroscopy in Multicomponent Polymeric Coatings – Model Validation", Journal of Applied Polymer Science, Volume 126, Issue 6, pp. 3906 - 3918, June 2013. **Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:]**

14. B. K. Nandi and S. Patel, Removal of pararosaniline hydrochloride (Basic red 9) dye from aqueous solution by electrocoagulation: Experimental, kinetics and modeling, Journal of Dispersion Science and Technology, Volume 34, pp. 1713–1724, 2013. [**Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:]**

15. S. K. Tripathi, R. Tyagi and B. K. Nandi, Removal of Residual Surfactants from Laundry Waste Water: A Review, Journal of Dispersion Science and Technology, Volume 34, pp. 1526–1534, 2013. [**Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:**]

16. N. Sharma and B. K. Nandi, Utilization of Sugarcane Baggase, an Agricultural Waste to Remove Malachite Green Dye from Aqueous Solutions, Journal of Materials and Environmental Science, Volume 4, pp. 1052-1065, 2013. [**Citation Index**: N.A., **SNIP:** N.A., **SJR:** 0.28, **Impact Factor:** 1.21, **H-Index:** 10]

2012

17. R. K. Arya and M. Vinjamur, "Sensitivity Analysis of Free-Volume Theory Parameters in Multicomponent Polymer-Solvent-Solvent Systems", Journal of Polymer Engineering, Volume 32, Isssue 8-9, pp. 463-473, October 2012. **[Citation Index**:, **SNIP:**, **SJR:**, **Impact Factor:**, **H-Index:]**

Other Journals (International)

2014

1. S. Ramesh, H. Mahalingam and N.J. Rao, "Mathematical Modeling of Drying of Black Liquor Droplets in Recovery Boilers", International Journal of Chemical Engineering and Applications, Volume 5, Issue 1, pp. 1-5, January 2014**.**

2013

2. S. Singh. D.P. Chand, A. Chaki, A. Raghuvanshi, P.K. Singh and H. Mahalingam, "A novel polystyrene-supported Titanium Dioxide photocatalyst for degradation of Methyl Orange and Methylene Blue dyes under UV Irradiation", Journal of Chemical Engineering (IEB), Volume 28, Issue 1, pp. 9 – 13, January 2013.

3. S. Ramesh, A.S. Chaurasia, H. Mahalingam and N.J. Rao, "Kinetics of Devolatilization of Black Liquor Droplets in Chemical Recovery Boilers-Pyrolysis of Dry Black Liquor Solids", International Journal of Chemical Engineering and Applications, Volume 4, Issue 1, pp. 1-5, January 2013.

4. R. K. Arya, "Phase Separation in Multicomponent Polymer – Solvent – Nonsolvent Coatings", South African Journal of Chemical Engineering, Volume 18, Issue 1, pp. 30 – 40, 2013.

5. J. Katariya and R. K. Arya, “Drying of Binary Thin Film Polymeric Coatings: An Experimental Study”,Polish Journal of Chemical Technology, Volume 14, Issue 4, pp. 83-87, January 2013.

6. D.K. Mondal, B. K. Nandi and M.K. Purkait, Removal of mercury (II) from aqueous solution using bamboo leaf powder: Equilibrium, thermodynamic and kinetic studies, Journal of Environmental Chemical Engineering, Volume 1 pp. 891–898, 2013.

7. D. Prakash, M. Kumar, S. Kumar and N. J. Rao, “Reduction of effluent load in the jute cady pulp by substituting ClO_2 in place of Cl_2”, International Journal of Research in Environmental science and technology, Volume 3, pp. 46-50, 2013.

8. D. Prakash, S. Kumar and N. J. Rao, “Pollution load reduction by partial and full replacement of chlorine by chlorine dioxide in paper making”, International Journal of chromatographic science, Volume 3, pp. 1-4, 2013.

2012

9. K.N. Gupta, N.J. Rao and G. K Agarwal, “Adsorption of xylene on granular activated carbon in a packed bed”, International Journal of Scientific and Technology Research, Volume 1, Issue 4, pp. 90-93, January 2012.

10. R. Kumar, H. Mahalingam and K.K. Tiwari, “Modeling of Droplet Composition in Supercritical Antisolvent Process”, International Journal of Chemical Engineering and Applications, Volume 3, Issue 6, pp. 456-460, June 2012.

11. R. K. Arya, “Optimization of Free-Volume Theory Parameters For Ternary Polymeric Coatings From Binary Weight Loss Experiments”, International Journal of Scientific & Technology Research, Volume 1, Issue 3, pp. 27-30, April 2012.

12. R. K. Kumar Arya, “Photoelectrochemical Hydrogen Production Using Visible Light”, International Journal of Renewable Energy Research, Volume 2, Issue 2, pp. 289-294, April 2012.

13. R. K. Arya, “Non-Fickian Drying of Polymeric Coatings”, International Journal of Scientific & Technology Research, Volume 1, Issue 1, pp. 1-6, February 2012.

14. B. K. Nandi, K. Goyal, A. Yadav and S. Mishra, Treatment of colored domestic wastewater by electrocoagulation, International Journal of Chemical Sciences, Volume 10, pp. 2127-2138, 2012.

15. Kalpendra Rajurkar, Nilesh Kulkarni, Vilas Rane and Rahul Shrivastava, “Selective oxidation of toluene to benzaldehyde using Cu/Sn/Br catalyst system, International journal of chemical science: 9(2), 545-552, 2011.

16. J. Katariya and R.K. Arya, "Drying of binary thin films polymeric coatings: An experimental study", Polish Journal of Chemical Technology, Volume 14, pp. 83-87, 2012

2011

17. K.N. Gupta, N.J. Rao and G. K Agarwal, "Adsorption of toluene on granular activated", International Journal of Chemical Engineering and Applications, Volume 2, Issue 5, pp. 310-313, January 2011.
18. K.N. Gupta, N.J. Rao and G. K Agarwal, "Removal of toluene from nitrogen gas by adsorption in a fixed bed column: Experimental and Theoretical breakthrough curves", International Journal of Chemical Engineering and Applications, Volume 2, Issue 5, pp. 359-365, January 2011.
19. R. K. Arya, "Calibration Curves to Measure Concentrations in Multicomponent Polymeric Coatings Using Confocal Raman Spectroscopy" , International Journal of Chemical Engineering and Applications, Volume 2, Issue 6, pp. 421-424, December 2011.

National Journal Publications

Scopus Indexed Journals

2013

1. K.N. Gupta, N.J. Rao and G. K Agarwal, "Vapor phase adsorption of xylene on on granular activated carbon – Experimental and Theoretical Breakthrough curves", Indian Journal of Chemical Technology, Volume 20, Issue **42**, pp. 26-32, **October** 2013. [**Citation Index**: N.A., **SNIP:** , **SJR:**, **Impact Factor:** 0.6, **H-Index:**]

Other Journals (National Publications)

2014

1. R. K. Arya, "Characterization of Bio-Active Nanoparticles – Bhasma An Ayurvedic Drug", Indian Journal of Pharmaceutical Education and Research, Volume 48, Issue 1, pp. 61–68, 2014.
2. Leena Kapoor and Ashish Chaurasia, "Product yields and kinetics of pyrolysis of sawdust and bagasse particles", Energy Education Science & Technology Part A: Energy Science and Research, Issue 29, pp. 419-426, 2012.

International Conferences:

2014

1. S. Singh, P.K. Singh and H. Mahalingam, "Effective and Robust Impregnated and Strewn Polystyrene-supported Floating Titanium Dioxide Photocatalysts: Preparation, Characterization and Comparison", International Conference on Energy, Environment, Materials and Safety (ICEEMS'14), Kochi, India, pp. 275-280, ISBN: 978-93-80095-58-5, December 10-12, 2014.

2013

2. R. Kumar, H. Mahalingam and K.K. Tiwari, "Selection of Solvent in Supercritical Antisolvent Process", 5th International Conference on Chemical, Biological and Environmental Engineering (ICBEE2013), New Delhi, India, pp. 182-187, ISSN: 2212-6708, September 14-15, 2013.
3. K.N. Gupta and N.J. Rao, "Modeling and Simulation of fixed bed adsorption column", International Conference on Advances in Chemical Engineering (ICACE -2013), Raipur, India, April 5-6, 2013.
4. R. Kumar, H. Mahalingam and K.K. Tiwari, "Effect of process parameters on droplet size in supercritical antisolvent process", International Conference on Advances in Chemical Engineering (ICACE -2013), Raipur, India, April 5-6, 2013.

2012

5. R. Kumar, H. Mahalingam and K.K. Tiwari, "Droplet dynamics in supercritical antisolvent miconization process", International Conference on Chemical, Biological and Environmental Engineering (ICBEE 2012), Phuket, Thailand, pp. 53-57, ISBN: 978-981-07-1055-2, September 1-2, 2012.

2010

6. R. K. Arya and B. V. Sasank, "Finite Element Formulation of Transport Equations in Multicomponent Polymeric Coatings and Optimization of Free Volume Theory Parameters", International Conference on System Dynamics and Control –ICSDC, MIT Manipal, Karnataka, India August 19 – 22 ,2010.

National Conferences:

2014

1. C. K. Bhargava and R. K. Arya, "Simulation Analysis of Drying of Ternary Solution Coatings", CHEMCON 2014, UICET Chandigarh, India, December 27-30, 2014.
2. K. Tiwari and R. K. Arya, "A Simple and Practical Approach For Determining Pinch Temperatures and Utility Requirement Using MATLAB", CHEMCON 2014, UICET Chandigarh, India, December 27-30,2014.
3. T. Singh, A. Awasthi, P. Tripathi, S. Gautam, A. Gautam, Response surface methodology for Indian coal grinding, 67th Annual Session of IIChE (CHEMCON-2014) and Indo-Japanese Symposium, jointly organized by Chandigarh Regional Center, IIChE and Dr, SSB University Institute of Chemical Engineering & Technology, Chandigarh, 396-397, 27-30 December 2014.
4. S. Sharma, A. Gautam, S. Gautam, The dissolution of copper from spent low temperature shift catalyst using chelating agent, 67th Annual Session of IIChE (CHEMCON-2014) and Indo-Japanese Symposium, jointly organized by Chandigarh Regional Center, IIChE and Dr, SSB University Institute of Chemical Engineering & Technology, Chandigarh, 832-833, 27-30 December 2014.
5. N. K. Singh, S. Gautam, A. Gautam, Numerical simulation of the attachment of an infinitely extended particle to a bubble, 67th Annual Session of IIChE (CHEMCON-2014) and Indo-Japanese Symposium, jointly organized by Chandigarh Regional Center, IIChE and Dr, SSB University Institute of Chemical Engineering & Technology, Chandigarh, 1367-1368, 27-30 December 2014.
6. S. Kumar, Shivam Agrawal, **S. Gautam**, A. Gautam, S. Agrawal, Experimental study for the drying kinetics of pumpkin, 67th Annual Session of IIChE (CHEMCON-2014) and Indo-Japanese Symposium, jointly organized by Chandigarh Regional Center, IIChE and Dr, SSB University Institute of Chemical Engineering & Technology, Chandigarh, 736-737, 27-30 December 2014.
7. A. Maheshwari, S. Bajpai, **S. Gautam**, A. Gautam, S. Agrawal, Application of Box-Behnken design for pumpkin drying, 67th Annual Session of IIChE (CHEMCON-2014) and Indo-Japanese Symposium, jointly organized by Chandigarh Regional Center, IIChE and Dr, SSB University Institute of Chemical Engineering & Technology, Chandigarh, 734-735, 27-30 December 2014.

2013

8. K.N. Gupta and Noopur Anand Shrivastava, "Gas phase adsorption of toluene on powdered activated carbon" National Conference on Environmental Sustainability and Society: The Growing Paradigm Shift (ESS -2013), Guna, India, pp. 182-187, March 30-31, 2013.
9. U. M. Singhal, R. Dixit, and R. K. Arya, "Drying of Multilayer Polymeric Coatings: Experimental Study", Chemcon-2013, UICT Mumbai, India, December 27-30, 2013.
10. N. J. Rao, "From one of the most polluting to one of the most sustainable – A case study of Pulp and Paper industry", Invited Lecture, National Conference on Environmental Sustainability and Society: The Growing Paradigm Shift (ESS - 2013), Guna, India, March 30-31, 2013.
11. S. Gautam and A. Gautam, " Kinetic extraction of nickel from primary reforming spent catalyst by aminopolycarboxylic acids, National Conference on Environmental Sustainability and Society: The Growing Paradigm Shift (ESS - 2013), Guna, India, pp. 30, March 30-31, 2013.
12. S.K. Samanta, K.Sushmita, S.Verma and Z.Abbas, "Influence of Teflon, Ceramic and Composite Supports on Efficient Microwave heating of oil-water emulsions", National Conference on Environmental Sustainability and Society: The Growing Paradigm Shift (ESS -2013), Guna, India, pp. 22, March 30-31, 2013.

2012

13. J. Katariya and R. K. Arya, "Drying of Binary Thin Film Polymeric Coatings: Experimental Validation", National conference on "Recent Advances in Chemical Engineering (RACE-2012)", University Department of Chemical Technology, North Maharashtra University, Jalgaon, India, February 4, 2012.
14. S. Tiwari, A.P. Singh and A. Chauraisa, "Experimental study on pyrolysis of sawdust", National conference on "Recent Advances in Chemical Engineering (RACE-2012)", University Department of Chemical Technology, North Maharashtra University, Jalgaon, India, February 4, 2012.
15. A.Suman, R.Agarwal and A.Chaurasia, "Production of Bisphenol A", National level technical paper/project/working model presentation competition for engineering students (GREENCHEM 2012), Yavatmal, India, February 27-28, 2012.

2011

16. N.J.Rao, "Sustainability Issues in Education and Research", Invited Lecture, Engineering Science Section, 98th Indian Science Congress, Chennai, Abstract pp 38-39,Jan. 3-7, (2011).
17. N.J.Rao, "Engineering Education – Challenges and Options", National Conference on "Globalization of Indian Engineering Education", OPJ Institute of Tech, Raigarh (Chattisgarh), October 14-15, (2011).
18.. N.J.Rao, "Challenges Before Engineering Education- Role of Social Sciences", International conference on "Role of Humanities and Social Sciences in Holistic Development of Future Technocrats (RHSSFT – 2011)", JUIT, Waknaghat, Sept. 23-24, (2011).
19. N.J.Rao, "Challenges to higher Education – Role of ICT", UGC Workshop on "ICT: An Effective Tool for Qualitative Improvement in Higher Education", at Govt. College, Aron (Guna), Oct. 10 (2011).
20. N.J.Rao, "Private Universities – Need, Operation and Regulation", Workshop on "Higher Education Reforms in Madhya Pradesh", Session on "Right Balance In Regulating Private Universities", Organized by Department of Higher Education, M.P., and World Bank, at Bhopal, 24 Slides, Oct. 03, (2011).
21. R. Subramanyam and N.N. Dutta, "Current trends in environmental engineering research-An overview", National conference on recent advancements in civil engineering and Infrastructural developments (RACE-InD 2011), JUET Guna pp- E32-E36, December 21-22, 2011.

2010

22. N.J.Rao, "Challenges Before Engineering Education", Proceedings of 3rd National Conference on Education and Research (ConfER-2010) – Education and Research in Information Technology, at JIET Guna, Editors V.Tyagi, P.K.Verma and H.R.Vishwakarma, McMillan Advanced Research Series, pp 17-25, March. 6-7, (2010).
23. N.J.Rao, "New Paradigm in Science and Engineering Teaching", Invited Lecture, Engineering Science Section, 97th Indian Science Congress, Thiruvanantapuram, Jan. 3-7, (2010).
24. L. Kapoor and Ashish Chaurasia, "Experiment Based investigation of pyrolysis of biomass", National conference on recent advances in materials science and engineering, RAMSE 2010, Guna, India, October 23-24,2010.

Books Published

2012

1. A.S. Chaurasia and B.V. babu, "Modeling, Simulation, and Optimization of Pyrolysis of Biomass", Lambert Academy Publication, Germany, Year – 2012.
2. S.K. Samanta and T. basak, "Microwave Heating of Oil-Water Emulsions", Lambert Academy Publication, Germany, Year – 2012.

2010

3. Raj Kumar Ary, "Diffusion in Multi Component Polymeric Coatings", Lambert Academy Publication, Germany, Year – 2010, ISBN-13:978-3838381565.
4. Ashish Chaurasia, "Key Challenges in Biomass Gasification Processes: Model and Experimental based Investigation of Potential of Biomass Gasification Processes", Lambert Academy Publication, Germany, Year – 2010, ISBN-13:978-3838373706.

Annexure-II/CHE

List of Faculty selected to visit other laboratories / institutes / industries.

International Visit

Rahul Kumar

- Mr. Rahul Kumar presented a paper titled as "Droplet dynamics in supercritical antisolvent miconization process, in International Conference on Chemical, Biological and Environmental Engineering (ICBEE 2012) Phuket, Thailand, September 1-2, 2012.

Ashish Chaurasia

- Ashish Chaurasia participated in International Conference on " Innovative Green Technology for Sustainable development (CUTSE2011), Sarawak, Malaysia during November 8-9, 2011.

National Visit

N. J. Rao

- N. J. Rao attended workshop on "Technological aspects for improved performance in pulp and paper sector", organized by CII and GIZ GmBH, Vapi, Gujrat on April 26, 2013.
- N.J.Rao delivered an invited lecture on "Sustainability Issues in Education and Research", Engineering Science Section, 98th Indian Science Congress, Chennai, Jan. 3-7, 2011.
- N.J.Rao attended "Engineering Education – Challenges and Options", National Conference on "Globalization of Indian Engineering Education", OPJ Institute of Tech, Raigarh (Chattisgarh), October 14-15, 2011.
- N.J.Rao attended "Challenges Before Engineering Education- Role of Social Sciences", International conference on "Role of Humanities and Social Sciences in Holistic Development of Future Technocrats (RHSSFT – 2011)", JUIT, Waknaghat, Sept. 23-24, 2011.
- N.J.Rao attended "Private Universities – Need, Operation and Regulation", Workshop on "Higher Education Reforms in Madhya Pradesh", Session on

"Right Balance In Regulating Private Universities", Organized by Department of Higher Education, M.P., and World Bank, at Bhopal, 24 Slides, Oct. 03, 2011.

- N.J.Rao delivered an invited lecture on "New Paradigm in Science and Engineering Teaching", Engineering Science Section, 97th Indian Science Congress, Thiruvanantapuram, Jan. 3-7, (2010).

N. N. Dutta

- N. N. Dutta attended workshop on "Membrane Technology for Air Pollution Control', organized by FICCI, New Delhi, June 9-10, 2013.
- N. N. Dutta delivered an invited lecture on "Perspectives in Petroleum Microbiology and Biotechnology" National Workshop on "The Advances in Applied Microbiology and Bioprocess Engineering" with special reference to Petroleum Biotechnology , Tezpur University, Assam, August 23-24, 2012.

Hari Mahalingam

- H. Mahalingam presented a paper titled as "Selection of Solvent in Supercritical Antisolvent Process", 5th International Conference on Chemical, Biological and Environmental Engineering (ICBEE2013), New Delhi, India, September 14-15, 2013.
- Hari Mahalingam attended five days SERC school on "Nonlinear programming and soft computing techniques for chemical engineering" organized by NIT, Durgapur during December 12-16, 2011.
- Hari Mahalingam conducted workshop on "Introduction to Computational Fluid Dynamics", during July 1-3, 2010 at Jaypee Cement Plant Rewa, M. P.

Kaushal Naresh Gupta

- K.N. Gupta presented a paper titled as "Modeling and Simulation of fixed bed adsorption column", International Conference on Advances in Chemical Engineering (ICACE -2013), Raipur, India, April 5-6, 2013.
- Kaushal Naresh Gupta attended three days workshop on "Process Intensification of Chemical Processing Applications" organized by ICT, Mumbai during January 28-30, 2011

Raj Kumar Arya

- R. K. Arya presented a paper titled as "Finite Element Formulation of Transport Equations in Multicomponent Polymeric Coatings and Optimization of Free Volume Theory Parameters", International Conference on System Dynamics and Control –ICSDC, MIT Manipal, Karnataka, India August 19 – 22 ,2010.

Rahul Shrivastava

- Rahul Shrivastava attended three day worksop on Use of fly ash in cement industry – Issues and challenges in Regional Training Centre (North), J.K. Cement Works, Nimbahera, Rajasthan, 03-02-2011 to 05-02-2011.

Govind Kumar Agarwal

- Govind Kumar Agarwal attended three days workshop on "Process Intensification of Chemical Processing Applications" organized by ICT, Mumbai during January 28-30, 2011

Rahul R. Chaudhari

- Rahul R. Chaudhari attended five days Workshop cum training course on Chemical Engineering Laboratory in ICT, Mumbai during 28th to 2nd October, 2011.

Ashish Chaurasia

- Ashish Chaurasia conducted workshop on "Introduction to Computational Fluid Dynamics", during July 1-3, 2010 at Jaypee Cement Plant Rewa, M. P.
- Ashish Chaurasia participated in "International Symposium and 64th Annual Session of IICHE (CHEMCON 2011), Bangalore during December 27-29, 2011.

Rahul Kumar

- Rahul Kumar attended five days Workshop cum training course on Chemical Engineering Laboratory in ICT, Mumbai during 28th to 2nd October, 2011.

- Rahul Kumar presented a paper titled as “Effect of process parameters on droplet size in supercritical antisolvent process”, International Conference on Advances in Chemical Engineering (ICACE -2013), Raipur, India, April 5-6, 2013.

B. K. Nandi

- B. K. Nandi attended five days SERC school on “Nonlinear programming and soft computing techniques for chemical engineering” organized by NIT, Durgapur during December 12-16, 2011.

Annexure-III/CHE

List of Faculty serving in various committees

Narendra Nath Dutta

- **Vice President Organizing Committee:** National Conference on Environmental Sustainability and Society: The Growing Paradigm Shift (ESS -2013).
- **Editorial Board Member**: Applied Membrane Science and Technology
- **Editorial Board Member**: Chemical Engineering Research Update
- **Editorial Board Member**: Journal of Assam Science Society

Hari Mahalingam

- **Organizing Secretary:** Workshop on Advanced Separation Processes.

Alok Gautam

- **Organizing Secretary:** Workshop on Process Simulation using CHEMCAD and MATLAB.