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EVALUATIVE REPORT

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

for

ASSESSMENT AND ACCREDITATION

Submitted to

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

BANGALORE

JAYPEE UNIVERSITY OF ENGINEERING AND TECHNOLOGY
GUNA

November 26, 2015

EVALUATIVE REPORT OF THE DEPARTMENT

1. Name of the Department : Electronics and Communication Engineering (ECE)

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 Electronics and Communication Engineering (ECE).

4. Names of programmes offered:

a) PhD (Full Time/Part Time)
b) PG - M.Tech. ((Electronics & Communication Engineering)
c) UG - B.Tech. (Electronics & Communication Engineering)

5. Interdisciplinary programmes and departments involved:

Department does not offer any interdisciplinary programmes. However, the department program curriculum provides few courses from other departments namely: Computer Science Engineering, Mathematics, Physics and Humanities and Social Sciences (HSS). Some courses are also offered by department to all other disciplines of the B.Tech. and M.Tech. programs.

Following are the number of credits and percentage of courses taken by other departments of the University in programs offered by CSE departments.

Course	Total Credits	CSE		HSS		Math		Physics		Others*	
		No.	%	No.	%	No.	%	No.	%	No.	%
B.Tech.	195	19	9.74	24	12.31	12	6.15	9	4.62	3	1.53
M.Tech.	76	3	3.95	0	0	0	0	0	0	0	0

*Department of Chemical Engineering (CHE) share a 3 credit course in B.Tech. 2nd semester

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

Currently, department has not designed any courses in collaboration with other universities and foreign institutions. However, the department has designed a course (Instrumentation and Process Control) for the under graduate student in collaboration with Jaypee Cement Industries. Also, the department has an academic collaboration with University of Florida where a final year B. Tech student can register for 8th semester in University of Florida, Gainesville, Florida, USA through credit transfer.

7. Details of programmes discontinued, if any, with reasons:

None

8. Examination System: Annual/Semester/Trimester/Choice Based Credit 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 tests/examinations held in each semester as specified in previous section. 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 participate in the courses offered by other departments. The table below lists such courses offered by the department to other departments

Beneficiary Department	Course Name
All Branches of B. Tech. programs	Electrical Circuit Analysis
All Branches of B. Tech. programs	Electrical Circuit Analysis Lab
B. Tech. Computer Science Engineering	Electronic Devices and Circuits
B. Tech. Computer Science Engineering	Basic Electronics Lab
B. Tech. Computer Science Engineering	Signals and Systems
B. Tech. Computer Science Engineering	Signals and Systems Lab
B. Tech. Computer Science Engineering	Digital Electronics
B. Tech. Computer Science Engineering	Digital Electronics Lab
B. Tech. Computer Science Engineering	Communication Systems
B. Tech. Computer Science Engineering	Microprocessor and Interfacing
B. Tech. Computer Science Engineering	Microprocessor and Interfacing Lab
B. Tech. Computer Science Engineering	Communication Systems I
B. Tech. Computer Science Engineering	Information Theory and Applications (Elective)
B. Tech Mechanical Engineering	Electrical Sciences
B. Tech Mechanical Engineering	Electrical Sciences Lab
B. Tech Mechanical Engineering	Mechatronics (Elective)
B. Tech Chemical Engineering	Electrical and Electronics Engg.
B. Tech Chemical Engineering	Electrical and Electronics Engg. Lab
B. Tech. Computer Science Engineering	Mobile Communication (Elective)

10. Number of teaching posts

Positions		**Sanctioned**	**Filled**	**Actual (including CAS & MPS)**
Professor		2	1	
Associate Professors		4	Nil	
Asst. Professors	G-I	18	Nil	
	G-II		9	
	SG		7	
Teaching Assistants*			12*	

*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	Experience (in Years)	No. of Ph.D./ M.Tech. students supervised for the last 4 years
Prof. B. K. Mohanty	Ph.D.	Professor	VLSI, Digital Signal Processing	22	Ph.D. Supervision- Completed: 01 Ongoing: 04 M.Tech. Supervision Completed: 04
Dr. Narendra Singh	Ph.D.	Assistant Professor (SG)	Digital Signal Processing	11	Ph.D. Supervision- Completed: Nil Ongoing: 05 M.Tech. Supervision Completed: 03
Dr. Rajesh K. Vishwkarma	Ph.D.	Assistant Professor (SG)	Microstrip and broadband antenna	10	Ph.D. Supervision- Completed: Nil Ongoing: 01 M.Tech. Supervision Completed: 03
Dr. Nafis U. Khan	Ph.D.	Assistant Professor (SG)	Digital Image Processing	5	Ph.D. Supervision- Completed: Nil Ongoing: 01 M.Tech. Supervision Completed: 01
Dr. Ravi Kumar	Ph.D.	Assistant Professor (SG)	MIMO and Microstrip Antenna	11	Ph.D. Supervision Completed: Nil Ongoing : 01 M.Tech. Supervision Completed: Nil
Dr. Jitendra Kanungo	Ph.D.	Assistant Professor (SG)	VLSI Design	6	Ph.D. Supervision Completed: Nil Ongoing : 02 M.Tech. Supervision Completed: 01
Dr. Anurag Mahajan	Ph.D.	Assistant Professor (SG)	VLSI and Digital Signal Processing	13	Ph.D. Supervision- Completed: Nil Ongoing: 02 M.Tech. Supervision Completed:02
Dr. Rahul Pachauri	Ph.D.	Assistant Professor (SG)	Digital Signal Processing	16	Ph.D. Supervision- Completed: Nil Ongoing: 03 M.Tech. Supervision Completed:03

Mr. Manish Kumar Patidar	M.E.	Assistant Professor (G-II)	OFDM, Neural Networks	11	M.Tech. Supervision Completed:01
Mr. Subodh Singhal	M. Tech.	Assistant Professor (G-II)	VLSI Design	9	M.Tech. Supervision Completed:02
Mrs. Shefali Sharma	M.E.	Assistant Professor (G-II)	Networking, Digital Image Processing	13	M.Tech. Supervision Completed: 01
Mr. Deepak Sharma	M. Tech.	Assistant Professor (G-II)	Digital Image and Signal Processing	9	M.Tech. Supervision Completed: 03
Mr. Gaurav Saxena	M. Tech.	Assistant Professor (G-II)	Digital Image Processing	12	M.Tech. Supervision Completed: 02
Mr. Sujit Kumar Patel	M. Tech.	Assistant Professor (G-II)	VLSI design	6	M.Tech. Supervision Completed: 02
Mr. Jitendra Raghu vanshi	M. Tech.	Assistant Professor (G-II)	Control Systems, Soft Computing	4	M.Tech. Supervision Completed: Nil
Mrs. Rishika Chauhan	M. Tech.	Assistant Professor (G-II)	Digital Communication	4	M.Tech. Supervision Completed: Nil
Mrs. Ranu Gupta	M. Tech.	Assistant Professor (G-II)	Digital Image processing	7	M.Tech. Supervision Completed: Nil

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

The list of some senior visiting fellows visited the department is as follows:

I. **Prof. Gaurav Saxena** (University of Rochester, USA)

Outcome: He has visited the University to conduct one week faculty development workshop on Image processing and digital communication. The visit was useful for faculties to familiarize various issues related to noise processes for digital communication. The visit was helpful for developing courses for M.Tech students on digital communication.

II. **Prof. Ganapati Panda** (IIT, Bhubaneswar)

Outcome: The visit was helped the faculty community to understand evolutionary computing and its application to many real life problems of engineering field. The visit immensely helped faculty working on grid computing, sensor network and distributed learning, and motivated them to pursue research on those areas.

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 14:1
- For the M.Tech. program the student teacher ratio is 11:1

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

	Sanctioned	**Filled**	**Actual**
Technical	9	8	8
Administrative	Centrally Managed at University Level		

16. Research thrust areas as recognized by major funding agencies

Department so far not received any grant for collaborative research from major funding agencies.

However, a good number of faculty members undertaking research on the following thrust areas:

(i) High-performance accelerator design
(ii) Image processing
(iii) Digital communications

(i) High-performance accelerator design

Over the years, digital signal processing (DSP) applications become more prevalent in everyday use. DSP algorithms are computational intensive and most of its applications demand real-time performance. Therefore, DSP algorithms are implemented in dedicated hardware in most of the DSP applications. Dedicated hardware accelerators are specifically designed to process audio, image and video signals in real-time. These hardware accelerators integrated with general processing cores in most of embedded systems enabled with multimedia processing. Currently multi core processors used in smart phones, digital camera, laptops, and notepads include hardware accelerators.

Due to ever increasing user demand for higher and better performance at lower cost, lower power consumption and better reliability, the implementation of DSP function become more challenging. High-performance, low-power, low-cost and reliability are four mutually conflicting design features for hardware accelerators implementing complex DSP functions. The department take up these research challenges. Develop algorithms and architectures to meet the design challenges of hardware accelerators for next generation technology. Research is undertaken on the following topics during last five years.

- Discrete wavelet transform (DWT) is widely used multi-media signal processing especially for speech, image, video compression and volumetric data-compression. DWT is the most complex block in the compression algorithm. Efficient implementations of DWT certainly improve the performance of the receiver which is mostly resource and power constrained.

- Adaptive filter widely used in all digital communication channels for noise cancellations, inter symbol interference reduction and equalization. The major design challenge in adaptive filters used in communication channels is the processing. Due to feedback loop, adaptive algorithms do not support concurrent processing. The department undertake the research to develop algorithm mapping and architecture design to provide improve performance at lower power consumption.

- Complex learning algorithms are used in active noise control (ANC) systems to suppress low-frequency non-linear noise mostly prevalent in real life situations. Low-power implementation of these complex algorithms in hardware accelerators is a challenging issue. Besides, wireless sensor network (WSN) use adaptive algorithm for distributed learning. Realization of an ultra low-power design for wireless sensor node is a challenging issue. Research is ongoing to address the issues related to ANC systems and WSN.

- The emergence of various wireless communication standards, the wireless receiver become more complexity as separate hardware designs are used for different communication standards. Since, wireless receivers are resource and power constrained, a reconfigurable design is necessary for multi-standard wireless receivers. Research in ongoing on reconfigurable designs to address the issues of multi-standard wireless receivers.

- Compressive sensing is an emerging field whose theory leverages the known signal structure to acquire sampled data at a rate proportional to the information content rather than the frequency content of a signal. This would enable far fewer data samples than traditionally required when capturing signals with relatively high bandwidth, but a low information rate. Low power hardware accelerator design for implementation of compressive sensing algorithm is an interesting and challenging research area for wireless sensor network, bio-medical applications, under sea wireless sensor network. Department also undertake research on compressive sensing.

- The research activities in the VLSI Group focus on Nano-scale Device Modelling: SRAM design, Standard cell library characterization for CMOS based combinational circuits, and novel devices based on multilayer thin film structures.

(ii) Signal and Image processing

Signal and image processing algorithms are used to process one dimensional and two dimensional signals. Department undertake research on the area such as filter bank design, interpolator and decimation filter design, multi-modal hand biometric systems, image denoising, digital water mark, content based image and video retrieval. Design of efficient signal processing algorithm is the main objective of the ongoing research.

(iii) Digital communications

OFDM and Antenna are the major areas of research. Antenna designs an important area of research for wide-band wireless and cellular communications. Soft computing is a consortium of methodologies that works synergistically and provides flexible information processing capability for handling real life ambiguous situations. The important members of soft computing family are Artificial Neural Network (ANN), Fuzzy logic, Genetic algorithm and Adaptive Network-Based-Fuzzy Inference System (ANFIS) etc. Department undertake research on ANN, ANFIS, Microstrip antenna, multi band and wide band antennas for portable wireless applications, Wi-Fi, radio- frequency identification (RIFD) and cellular antennas.

17. Number of faculty with ongoing projects from

a) National: Not yet received

b) International funding agencies: Not yet received

c) Total grants received: Not yet received

d) Give the names of the funding agencies, project title and grants received project-wise: Not yet received

18. Inter-institutional collaborative projects and associated grants received

a) National collaboration:

Not yet received.

b) International collaboration:

Currently department has not received any inter-institutional funded projects from international collaboration. However, few faculties of the department have got assignment to work in projects funded by international funding agencies. Detail of such assignments is given in the table below.

S.No	Name	Place of visit and duration	Title of the project and name of the funding agency
1	B.K. Mohanty	School of Computer Engineering, Nanyang Technological University, Singapore October 13, 2014 to July 31, 2015	Multicore systems in 3-D Integrated circuit Funding agency: Agency of Science, Technology, and Research (ASTAR), Singapore
		Department of Computer Engineering, Qatar University, Doha, Qatar October 4, 2012 to January 04, 2013	FPGA implementation signature based Biometric system Funding Agency: Qatar National Research Fund

c) Inter-institutional collaborative research:

Besides, a large number of faculties are currently working in collaboration with researchers of other national and international institutes with no formal funding. These research collaborations have also produced significant academic outputs. The list of collaboration research undertaken by the department faculty is given in the below tables.

Research collaboration with National Institutes

Sl. No	Faculty name	Research Collaborator affiliation	Research Area	Outcomes (Publications)
1	Prof. B. K. Mohanty	K. Shridharan, IIT, Chennai	Discrete Hadamad Transform	0
		Ganapati Panda, IIT Bhubaneswar	ANC and distributed computing	0
2	Dr. Jitendra Kanungo	Dr. Sudeb Dasgupta, IIT Roorkee,	Low power VLSI	3
		Dr. Gaurav Kaushal, NIT Patna,	Device Modeling	0
		Dr. Santosh K. Vishwakarma, IIT Indore,	MOS Devices	0

3	Dr. Narendra Singh	Rajiv Saxena, Jaypee University, Anoopshahar	Signal Processing	3
		Sanjeev Narayan Sharma, Alok Jain Samrat Ashok Technological Institute Vidisha, Madhya Pradesh	Multi-rate and Biomedical Signal Processing	0
		Dr. Ashutosh K. Singh, Dr. Amit Mishra, Dr. Hemdutt Joshi, Thapar University, Patiala,Punjab	Speech Processing, Neural Network, OFDM	1
4	Dr. Nafis U. Khan	Dr. Rajiv Tripathi, NIT Delhi	Wireless sensor network	0
5	Dr. Rahul Pachauri	Sanjeev Narayan Sharma, Samrat Ashok Technological Institute Vidisha,	Signal processing	3
6	Mr. Manish K. Patidar	Rajiv Saxena Jaypee University, Anoop Shahar	OFDM	1
		Dr. Amit Mishra Thapar University, Patiala, Punjab	Artificial Neural Network	1
7	Mrs. Shefali Sharma	Satish K. Singh, Indian Institute of Information Technology Allahabad	Image processing	2
		Rajiv Saxena Jaypee University, Anoopshahar	Image processing	2
8	Mr. Deepak Sharma	Rajiv Saxena Jaypee University, Anoopshahar	Signal processing	3
9	Mr. Jitendra Raghuwanshi	Dr. Amit Mishra Thapar University, Patiala, Punjab,	Artificial Intelligence, Speech Processing	
10	Mr. Gaurav saxena	Dr. Akhilesh R. Upadhyay, SIRT Bhopal	Image processing	1
		Rinku Bhatia ,Amit Geowl andVineet Shrivatava ITM gwalior		2
11	Mrs. Ranu Gupta	Dr. Ashutosh K. singh Thapar University, Patiala, Punjab	Image Processing	0

Research collaboration with International Institutes

S. No	Faculty name	Research Collaborator affiliation	Research Area	Outcomes (Publications)
1	Prof. B.K. Mohanty	Pramod Kumar Meher, Nanyang Technological University, Singapore	DWT, FFT, Filters and Compressive sensing	17
		Thambipillai Srikanthan Nanyang Technological University, Singapore	Multicore in 3-D IC	5
		Tokunbo Ogunfunmi Santa Clara University, USA	Adaptive filtering	1
		S. Y. Park, Myongji University, South Korea	HEVC	1
		Abbes Amira and Somaya Maadeed Qatar University, Qatar	Biometric	3
		Hasan Rabah, Institute Jean Lamour, University of Lorraine, Nancy, France	Compressive sensing,	1
		M.N.S.Swamy, Concordia University, Canada	Reconfigurable computing	1

The list of faculty publication produced out of the above mentioned collaboration research is given in the **Annexure-I/ECE**.

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

Not yet received

20. Research facility / centre with

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

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

Nil

22. Publications:

Department emphasizes on publications in reputed international/national journals and conferences, books, edited books, book chapters etc. Department faculties actively are engaged in these activities. Summary of these publications from January 2010 upto October 2015 are given in the table below.

I. Summary of the publications from January 2010 to October 2015 is as follows:

Category	2010	2011	2012	2013	2014	2015
International Journals	5	8	7	16	25	14
National Journals	1	-	-	-	1	-
International Conferences	7	5	6	7	3	6
National Conferences	6	2	4	2	-	3
Total	19	15	17	25	29	23
Publication ratio*	0.73	0.56	0.65	1.87	1.611	1.35

*Publication ratio calculated using the formula: Total publication / number of faculty

Category	Total publications
International Journals	81
National Journals	2
International Conferences	38
National Conferences	18

II. Other publications:

Category	Number
Monographs	0
Chapters in Books	0
Edited Books	0
Books with ISBN	0
Total	0

III. Journals Indexed in SCOPUS/SCI/Others

Category	SCOPUS	SCI	Others	Total
International	38	33	43	114
National	0	0	2	2

IV. Citation Index:

Category	International Database	2010	2011	2012	2013	2014	2015
International Journal	**SCI**	1	3	1	6	7	9
	SCOPUS	2	6	3	8	8	12
	Others	3	2	3	8	17	3
National Journal	**SCI**	0	0	0	0	0	0
	SCOPUS	0	0	0	0	0	0
	Others	1	0	0	0	1	0

V. Indexing details of publications:

Indexing parameter	Details
Google citations	Total citations: 286 Range : 0-30 Average : 7.526
SNIP	Range : 0-3.878 Average : 1.278
SJR	Range : 0-2.82 Average : 0.6875
Impact Factor	Range : 0-4.58 Average : 2.106
H-index	Range : 0 - 162 Average : 42.157

Detail publication list with international collaboration is given in **Annexure-I/ECE** and without international collaboration is given in **Annexure-II/ECE.**

23. Details of patents and income generated:

Not yet received

24. Areas of consultancy and income generated:

JSS is the sponsoring body of the University. Jaypee Group supports JSS, has business interest in cement production and power generation. Jaypee Group recruits ECE UG/PG students as graduate engineers for its cement plants, thermal power plants, and fertilizer plants. The primary job profile of ECE graduate engineers is to use the state-of-the art digital control system for automatic control of industrial processes. Jaypee Group identified ECE department for providing preliminary training to the graduate engineers on instrumentation and process control.

With consultation with industry specialists the department has prepared a 4-weeks course module on "Instrumentation and Process Control". The 4-weeks short term program offered to ECE graduate trainees placed in Jaypee Group companies without any financial involvement. Details of the short term courses organized by the department during last five years are given in Table below.

S. No	Training module	Duration	No of Participants	Resource persons
1	Instrumentation and Process control (Graduate Trainee recruited by Jaypee Group)	May 25- June 21, 2010	20	Prof. N. J. Rao, Prof. Rajiv Saxena, Prof. B. K. Mohanty, Prof. P. K. Singh, Dr. Sarang Pande, Dr. Narendra Singh Dr. A. K. Singh Dr. R. K. Vishwakarma Mr. Gaurav Saxena Dr. G. K. Agarwal Mr. Bhagwan Singh (Jaypee Bela Plant)
2		May 31 – June 26, 2010	22	

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

The following faculty visited various University/Institute and taken teaching/research assignments as given in the table below:

Sl.No	Name & Department	Place of visit
1	Prof. B. K. Mohanty	School of Computer Engineering, Nanyang Technological University, Singapore
		Department of Computer Engineering, Qatar University, Doha, Qatar
2	Dr. Balwinder Raj	University of Rome, Tor Vergata, Italy
3	Dr. Rajiv Tripathi	IIT Kanpur, India
4	Dr. Amit Mishra	Principal in Jaypee Polytechnic & Training Centre at Rewa (M.P.)

a) National committees:

Name of faculty	Name of Committee	Duration and Place
Dr. Rajesh K. Vishwakarma	National Conference on Recent Advances in Microwave Engineering	February 28 - March 1, 2015, MITS, Gwalior

b) International committees:

Name of Faculty	Details
Prof. B. K. Mohanty	• **Technical Program Committee Member:** International Symposium on Consumer Electronics (ISCE2011) Sponsored by IEEE Consumer Electronics Society • **Technical Program Committee Member:** International Symposium of Electronics System Design (ISED2011), Kochin, India • **Technical Program Committee Member**: IEEE International Conference on Signal Processing and Communication organized by JIIT Noida and IEEE Delhi Section, Dec 12-14, 2013. • **Technical Program Committee Member**: 2nd International Conference on Signal Processing and Integrated Networks, Amity University, Noida, Jan 19-20 Feb, 2015. • **Technical Program Committee Member**: 3rd International Conference on Signal Processing and Integrated Networks, Amity University, Noida, Feb 11-12, 2016.
Dr. Ravi Kumar	• Member: IEEE, IETE, IAENG, IACSIT
Dr. R. K Vishwakarma	• **Member**: District Coordinator of Vigian Jagriti Manch Ambikapur • **Life Member**: Chhattisgarh Vigyan Bharati Sansthan Raipur
Mr. Manish K. Patidar	• Associate member: IETE , New Delhi

c) Editorial Boards:

Name of Faculty	Details
Prof. B. K. Mohanty	Associate Editor of Journal of Circuit, System and Signal Processing, Springer, since 2012.
Dr. Ravi Kumar	Editorial Board Member of Blue Ocean Research Journals (BORJ).

d) Any other (please specify)

Name of Faculty	Review committee member
Prof. B. K. Mohanty	• IEEE Transaction on Circuit and System-II, Express Brief, • IEEE Transaction on Circuit and System-I, Regular Papers • IEEE Transaction on Circuit and System for Video Technology • IEEE Transactions on Computers • IEEE Transactions on Very Large Scale Integrations (VLSI) Systems • IEEE Transactions on Signal Processing • IEEE Signal Processing Letters • IET Circuit Device and Technology, IET Signal Processing • IET Image Processing • IET Signal Processing • Journal of Circuit, System and Signal Processing, Springer • Journal of Microprocessors and Microsystems, Elsevier Science
Dr. Ravi Kumar	• IEEE Antennas and Wave Propagation Letters • International Journal of Microwave and Wireless Technologies • Wireless Personal Communication, Springer.
Mr. Gaurav Saxena	• International Journals of Modern Embedded System (IJMES) under the aegis of Research and Educational Society, Rajasthan, India • 3rd IEEE International Advance Computing Conference (IACC-2013) (AKGEC), Ghaziabad, India
Mr. Subodh Singhal	• Circuit, Systems and Signal Processing, Springer.
Dr. Anurag Mahajan	• Circuit, Systems and Signal Processing, Springer.
Mrs. Ranu Gupta	• Wireless Personal Communication, Springer.

Members in Professional Body

Prof. B.K.Mohanty	• Senior Member, IEEE • **Life Member:** : IETE , New Delhi
Dr. Ravi Kumar	• **Life Member**: IETE , New Delhi • Member: IEEE, IAENG, IACSIT,UACEE
Dr. R. K Vishwakarma	• **Member**: District Coordinator of Vigian Jagriti Manch Ambikapur • **Life Member**: Chhattisgarh Vigyan Bharati Sansthan Raipur
Dr. Anurag Mahajan	• **Life Member**: ISTE • Associate member: IETE , New Delhi
Mr. Manish K. Patidar	• Associate member: IETE , New Delhi
Mrs. Ranu Gupta	• Member: Indian Science Congress

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

Department encourage faculty to attend workshops, refresher courses and faulty develop programs to improve teaching skills and update with emerging areas and technologies. The two step strategy is adapted by the department to recharge the faculty without affecting the scheduled academic program.

(i) Plan in-house faculty recharge programs
(ii) Faculty attend programs outside Universities/Institutions

(i) Plan in-house faculty recharge programs

Department invites eminent researchers, subject experts and scientists from reputed national and international universities/institutions to hold workshops, seminars and faculty development programs. The list of such programs organized by the department or allied departments and attended by department faculties during last five years is given in the table below:

S. No	Title of the program	Resource persons	Participants
1	Workshop on "VLSI Design", July 14-16, 2015	Prof.B.K.Mohanty Dr.Anurag Mahajan Dr.Jitendra Janungo, Mr.Sujeet Patel Mr. Subodh Singhal	All ECE faculty members

2	Invited Lecture on "Multidimensional Signal Processing" November 18, 2011.	Prof. V. M. Gadre (**IIT, Bombay**)	All ECE faculty members
3	IUCEE workshop on "Digital Communication, June 6-10, 2011.	Dr. Gaurav Sharma, (**University of Rochester, USA)**	All ECE faculty members of JUET and few faculties from sister institutions
4	Short-term course on "Digital Signal and Image Processing (DSIP-2010)", July 5 - 10, 2010	Prof. Rajiv Saxena Prof. B. K. Mohanty	All ECE faculty members of JUET and few outside participants from nearby institutions.
5	Communication Systems and Networking (CSN-2008)	Prof. K. L. Chopra **(Former Director, IIT, Kharagpur)** Prof. P.K.Meher **(NTU, Nanayang, Singapore)** Prof S. K. Kak **(IT-BHU)** Prof. S. L. Maskara **(JUIT, Waknaghat)** Prof. T. S. Lamba **(JUIT, Waknaghat)** Prof. R. C. Chakraborti **(Former Director, DTRL and ISS)**	All ECE faculty members of JUET and few outside participants from nearby institutions

(ii) Faculty attended programs inside University

S. No.	Name of faculty	Title of the program	Place and duration	Course Funded by the Agency
1	Dr. Rahul Pachauri	Ancillary Tools for Research	June 16-18, 2015, JUET	JUET
2	Mr.Deepak Sharma	Ancillary Tools for Research	June 16-18, 2015, JUET	JUET
3	Mr. Manish K. Patidar	Application oriented networking	July 9-13, 2013, JUET	JUET

(iii) Faculty attended programs outside Universities/Institutions

University encourage faculty to attend refresher courses/ orientation courses/workshops organized by various Universities during winter and summer vacations. University provides travel supports wherever possible and duty leaves to encourage the faculty to attend such programs. The list of faculties attended different programs organized by other universities is given in the table below.

S. No.	Name of faculty	Title of the program	Place and duration	Course Funded by the Agency
1	Dr. Rajesh K. Vishwakarma	Workshop on Computational Electromagnetics and RCS Prediction for Stealth Applications	September 24-28, 2012 Jodhpur	Defense Laboratory Jodhpur, IIR Bombay and Zeus Numerix
		Sixth Science Conclave	December 8-14, 2013 Indian Institute of Information Technology Allahabad	MHRD, Govt. of India
		Seventh Science Conclave	December 8-12, 2014 Indian Institute of Information Technology Allahabad	MHRD, Govt. of India
2	Dr. Rahul Pachauri	Signals & Systems	January 2-12, 2014. Samrat Ashok Technological Institute,Vidisha (M.P.)	IIT Kharagpur under the National Mission on Education through ICT (MHRD, Govt. of India)
		Signal Processing	December 4-6, 2014, Vidisha (M.P.),	Samrat Ashok Technological Institute (SATI)
		Teaching Engineering Using MATLAB & SIMULINK	July 5-7, 2011, Jaipur,	Jaipur Engineering College & Research Centre (JECRC),
3	Mrs. Ranu gupta	Signal Processing	December 4-6, 2014 Vidisha (M.P.)	Samrat Ashok Technological Institute (SATI)

List of training programs organized by allied departments.

The academic activities organized at the Institute are listed below:

(i) Visitors/ Guest Speakers:

The following two guest lecture activities have been organized by the department:

1. Lecture on Genetic Algorithm by Prof. G.N. Panda, IIT Bhubaneshwar, April 26, 2014.
2. Lecture on Digital Communication by Prof. Gaurav Sharma, University of Rochester, USA, June 6-10, 2011.

(ii) Workshops/ FDP:

1. Three days workshop on "VLSI Design", July 14-16, 2015.
2. An expert lecture on "Genetic Algorithm" on April 26, 2014.
3. Five days IUCEE workshop on "Digital Communication", on June 6-10, 2011.
4. One week short-term course on "Digital Signal and Image Processing (DSIP-2010)" on July 5-10, 2010.

28. Student projects

Mostly all the final year students do their projects in the department. However, few final year students placed in Infosys and Accenture are allowed to do their 8-semester projects work in the industry site. Based on the last five year data, the percentage of students taken projects in the department and outside the department is given below:

- Percentage of students who have done in-house projects including inter-departmental projects: 90%
- Percentage of students doing projects in collaboration with other universities/ industry/institute: 10%

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

(a) Faculty:

S. No.	Name of faculty member	Detail of Research Award
1.	Prof. B. K. Mohanty	IEEE Senior Member award, Sept. 2011
2.	Dr. Ravi Kumar	Best paper award in International conference organized by IEEE Computer Society, Bangalore Section and **ACEEE** with association of **IDES** (Institute of Engineers, Doctors and Scientist), August 1-2, 2012.

(b) Doctoral / post doctoral fellows:

S. No.	Doctoral / post doctoral fellows	Detail of Research Award
1.	Vikas Tiwari (Research Scholar)	**Young scientist awards (Electrical and Electronics)** by M. P. Council of Science and Technology in Computer Science Engineering and Information Technology at the 27th M. P. Young Scientist Congress held at Vigyan Bhawan, Bhopal on February 28- March 1, 2012.

(c) Students (Awards and honours received)

Few department students have attended various technical programs organized by premier institutions like IITs/NIT, and received awards and honour. The department do not have detail record of students.

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

S. No.	Year	Name of Seminars/ Conferences/Workshops	Source of funding	Resource persons
1	2015	Workshop on " VLSI Design", July 14 - 16, 2015	JUET, Guna	Senior Faculty Members of the Department
2	2011	Invited Lecture on "Multidimensional Signal Processing" November 18, 2011.	JUET, Guna	Prof. V. M. Gadre **(IIT, Bombay)**
		IUCEE workshop on "Digital Communication, June 6-10, 2011.	JUET, Guna	Gaurav Sharma, **(University of Rochester, USA)**
3	2010	Short-term course on "Digital Signal and Image Processing (DSIP-2010)", July 5 - 10, 2010.	JUET, Guna	Senior Faculty Members of the Department
4	2008	Communication Systems and Networking (CSN-2008)	JUET, Guna	Prof. K. L. Chopra **(Former Director, IIT, Kharagpur)** Prof. P.K.Meher **(NTU, Nanayang, Singapore)** Prof S. K. Kak **(IT-BHU)** Prof. S. L. Maskara **(JUIT, Waknaghat)** Prof. T. S. Lamba **(JUIT, Waknaghat)** Prof. R. C. Chakraborti **(Former Director, DTRL and ISS)**

31. Code of ethics for research followed by the departments

Department follows the code of ethics defined by the University. Strong emphasis is given on original research and thesis work, and reference works must be duly acknowledged. To enhance quality of research University adopted a strong anti-plagiarism policy. Research scholars and students before submitting their Ph. D. Theses and research papers are reviewed by DPMC committee member. M Tech thesis and Project reports are also reviewed by thesis and project committee.

32. Student profile programme-wise:

Name of the programme (refer to question no.4)	Applications received	Selected		Pass percentage	
		Male	Female	Male	Female
B. Tech					
2010	186	107	29	--	--
2011	183	95	34	99.35	100
2012	203	135	48	100	100
2013	100	61	24	97.67	99.93
2014	52	36	12	97.79	99.81
M. Tech					
2010	17	10	4	100	100
2011	21	13	6	100	100
2012	11	4	5	100	100
2013	05	2	2	--	--
2014	07	2	4	--	--
Ph. D.					
Up to 2015	21	18	3	Nos. awarded:	5 (5M,0F)
				Nos. Continuing:	16 (13M, 3F)
				Nos. Discontinued:	Nil

33. Diversity of students

Name of the programme (refer to question no.4)	% of students from the same university	% of students from other universities within the State	% of students from other universities from outside the State	% of students from other countries
B. Tech				
2010	Not Available	24.26	75.54	Nil
2011	Not Available	24.09	74.91	Nil
2012	Not Available	47.42	52.58	Nil
2013	Not Available	34.11	65.89	Nil
2014	Not Available	43.75	56.25	Nil

M. Tech				
2010	Nil	41.67	58.33	Nil
2011	Nil	57.89	42.11	Nil
2012	Nil	66.67	33.33	Nil
2013	Nil	100	--	Nil
2014	Nil	83.33	16.67	Nil
PhD				
2010	Nil	75	25	Nil
2011	Nil	100	Nil	Nil
2012	25	50	25	Nil
2013	Nil	100	Nil	Nil
2014	25	25	50	Nil

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

Examination	**2010 Batch**	**2011 Batch**	**2012 Batch**	**2013 Batch**	**2014 Batch**
NET	Not Available	Not Available	Not Available	4.16%	Not Available
SLET	Not Available	Not Available	Not Available	Not Available	Not Available
GATE(%)	20.00%	3.22%	21.05%	29.16%	14.81%
CAT	26.66%	16.12%	5.26%	4.16%	7.40%
TOEFL	Not Available	3.22%	Not Available	4.16%	3.70%
GRE	20.00%	32.25%	15.79%	25.00%	11.11%
G-MAT	Not Available	Not Available	Not Available	Not Available	Not Available
Defence Entrance	2%	Not Available	Not Available	Not Available	Not Available
CIVIL SERVICES	Not Available	3.22%	Not Available	Not Available	Not Available
Any other (specify)	6.66% (Bank Exam)	Not Available	Not Available	Not Available	Not Available
	Based on Data received by 15 Alumni students	Based on Data received by 31 Alumni students	Based on Data received by 19 Alumni students	Based on Data received by 24 Alumni students	Based on Data received by 27 Alumni students

35. Student progression

Student progression	Percentage against enrolled
UG to PG	10%
PG to M.Phil.	Nil
PG to Ph.D.	5%
Ph.D. to Post-Doctoral	Nil
Employed • Campus selection • Other than campus recruitment	80% 10%
Entrepreneurs	0.5%

36. Diversity of staff:

Percentage of faculty who are graduates	PG*	PhD*
From the same university	Nil	17.64
From other universities within the State	57.89	11.76
From universities from other States	42.10	11.76
From universities outside the country	Nil	Nil

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

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

Number of faculties received PhD during the assessment period is 11. Name of these faculties are:

S.No.	Name of the Faculty	Area of Research	Year of Degree Awarded	University
1.	Dr. Satish Singh	Image Compression	2010	J.U.E.T. Wakhnaghat (H.P.)
2.	Dr. Ashutosh K. Singh	Fractional Fourier Transform	2011	J.U.E.T. Guna (M.P.)
3.	Dr. Hemdutt Joshi	OFDM	2012	J.U.E.T. Guna (M.P.)
4.	Dr. Narendra Singh	Multirate Signal Processing	2012	J.U.E.T. Guna (M.P.)
5.	Dr. Rajiv Tripathi	Wireless Sensor Network	2013	IIT Kanpur (U.P.)

6.	Dr. Nafis U. Khan	Image Processing	2013	ABV-IIITM Gwalior (M.P.)
7.	Dr. Rajesh K.Vishwakarma	WLAN Antenna Design	2013	Pandit Ravishankar Shukla University Raipur (C.G.)
8.	Dr. Ravi Kumar	MIMO Communication Systems	2013	J.U.E.T. Guna (M.P.)
9.	Dr. Jitendra Kanungo	VLSI Design	2013	IIT Roorkee (U.K.)
10.	Dr. Anurag Mahajan	VLSI Signal Processing	2014	J.U.E.T. Guna (M.P.)
11.	Dr. Rahul Pachauri	Signal Processing	2015	R.G.P.V. Bhopal (M.P.)

38. Present details of departmental infrastructural facilities with regard to

(a) Library: Department uses the Learning Resource Centre (Central Library) of the university along with the departmental library with 193 titles.

(b) Internet facilities for staff and students:

- All the faculty members are provided with desktop computer with 24x7 internet connections, and they have access to Institute webkiosk and webmail.
- Students are provided with 24x7 internet/Wi-Fi connections and they have the webkiosk for all academic and examination details.
- Class rooms, lecture theatres, and labs are also equipped with audio-visual equipments and internet facility is available for teaching and demonstration.

(c) Total number of class room: 13 Lecture Theatres and 30 Class rooms/Tutorial Rooms of the university are shared with other departments.

(d) Lecture Theatres and few class rooms with ICT facility: Lecturer Theatres/ Class Rooms.

e) Student's Laboratories

Laboratory	Location	LAN	PC	Power backup	Capacity	E-Display Board	White Board
Basic Electronics Lab	Ramanujan Bhawan (Ground Floor)	Y	Y	Y	30	N	Y
Signal Processing Lab	Ramanujan Bhawan (Ground Floor)	Y	Y	Y	30	Y	Y
VLSI / VHDL Lab	Ramanujan Bhawan (Ground Floor)	Y	Y	Y	30	N	Y
Digital Electronics	Ramanujan Bhawan (1st Floor)	Y	Y	Y	30	N	Y
Communication System-1	Ramanujan Bhawan (IInd Floor)	Y	Y	Y	30	N	Y
Analog Electronics	Ramanujan Bhawan (IInd Floor)	Y	Y	Y	30	N	Y
Power Electronics	Ramanujan Bhawan (IInd Floor)	Y	Y	Y	30	N	Y
Communication System-2	Ramanujan Bhawan (IInd Floor)	Y	Y	Y	30	N	Y

f) Research Laboratories:

Application Specific Integrated Circuit (ASIC) design laboratory:
The laboratory is setup in 2011. The lab is equipped with Synopsys front-end and back-end EDA tools for ASIC design flow. The lab is used to undertake research work on high-performance accelerator design for various signal processing applications. Output produced out of this laboratory is summarized in the table below:

1.	Number of PhD Degree completed	01
2.	Number of PhD thesis ongoing	04
3.	Number of publications	30
4	Number of International Collaborations	5
5	Number of M.Tech Dissertation completed/ongoing	13

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

a) From the host institutions/universities

- **Doctoral Degree (Awarded)**

1. Dr. Ashutosh. K. Singh
2. Dr. Narendra Singh
3. Dr. Hemdutt Joshi
4. Dr. Ravi Kumar
5. Dr. Anurag Mahajan

- **Doctoral Degree (Pursuing)**

1. Mr. Manish k. Patidar
2. Mr. Deepak K. Sharma
3. Mr. Subodh K. Singhal
4. Mr. Sujit K. Patel
5. Mrs. Shefali Sharma
6. Mr. Jitendra Raghuwanshi
7. Mrs. Ranu Gupta
8. Mrs. Khushboo Pachouri
9. Mr. Mahesh Kumar Singh
10. Mr. Beerendra Kumar Patel
11. Mr. Vikas Tiwari
12. Mr. Abhishek Choubey
13. Mr. Veervart Singh Chandravanshi
14. Mr. Sunil Datt Sharma
15. Mr. Durgesh Nandan
16. Mr. Sanjeev Kumar

b) From other institutions/universities

- Doctoral Degree (Awarded)

1. Dr. Rajiv Tripathi
2. Dr. Nafis U. Khan
3. Dr. Rajesh K. Vishwakarma
4. Dr. Jitendra Kanungo
5. Dr. Rahul Pachauri

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.	4	4
2011-2012	M. Tech.	7	9
	Ph. D.	2	
2012-2013	M. Tech.	4	10
	Ph. D.	6	
2013-2014	M. Tech.	1	8
	Ph. D.	7	
2014-2015	M. Tech.	4	9
	Ph. D.	5	
2015-2016	M. Tech.	0	6
	Ph. D.	6	

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. International and nationally renowned academicians from many top rated institutes and industry professionals including our alumni are consulted while conceptualizing and designing new programs or revising the curricula of existing degree programs. A detail study is made to access the popularity of the program in neighboring states, placement prospect and explore the possible synergy between different departments/schools of the University for sharing of resource and prospects for interdisciplinary work. Based on the study outcomes and the recommendation of subject experts, department prepare a draft proposal and submit to the Board of Management (BOM) and Board of Governors (BOG) for formal approval of the proposal and create appropriate budgetary support for the new program. Based on the recommendation, department holds the meeting of the board of studies (BOS) including external experts to prepare the teaching scheme and syllabi for the new program. Finally the BOS recommendation sends to the Academic Council (AC) for consideration and approval.

42. Does the department obtain feedback from

(i) Faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

Department regularly collects faculty feedback on curriculum as well as teaching-learning-evaluation. The department holds faculty meeting twice in every semester. Faculty feedback on progress of theory and practical courses are reviewed and results of mid-term examination are analysed. Based on the faculty feedbacks and suggestions, corrective measures are planned to improve the performance of weaker students. Department hold the second faculty meeting at the end each semester to review the curriculum, teaching and evaluation and student performances. Faculty feedback on curriculum with respect to teaching, learning and evaluation are discussed in detail. Department hold the BOS once in every year to discuss the faculty suggestions on curriculum and sought external expert views. Department revise the curriculum as well as teaching learning and evaluation as per the recommendations of the BOS and implement.

(ii) Student feedback on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?

At the end of every semester, department collects student feedback on each theory and laboratory courses separately for the teaching faculty. Student feedbacks are analysed to find the conduct of the courses, course coverage and teaching methodology used by the faculty. Student also gives suggestions in their feedback about the improvement in the curriculum. The average student feedback score and the suggestions on key points are communicated to the concerned faculty for remedial measures. In the current practice, student feedback on staff is not collected. However, department heads give the staff feedback on their annual appraisal.

(iii) Feedback of alumni and employers on the programmes offered and how does the department utilize the feedback?

Department receives feedbacks from alumni and employers time to time directly through mails and via other department faculty sources. Important points from feedback are also discussed in the department faculty meetings and suggestions are shout to address the issues wherever possible.

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

Name	Designation
Ashok Sharma	Scientist 'D', ISRO, Honored by prime minister of India, Mr. Modi for **Mars Mission**
Rajeev Pratap Singh	Assistant Vice President, Bank of America
Madhur Shrivastava	Early Stage Researcher (USA)
Prateek Katiyar	Early Stage Researcher (USA)
Sachin Mehta	Design Engineer- 2 at AMD
Preksha singh	Engineering Assistant, AIR
Himanshu Jha	Process Engineer Haldia Petrochemical Ltd., West Bengal
Neha Shikha	Senior Analyst Analytics and Modeling
Deepak Bedi	Deputy Manager
Rajnikant Rajnish	Income Tax Inspector
Ajit Singh	Analyst (RAW)
Rajesh Ranjan	Senior Scientist, DRDO

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

S. No	Year	Title of the special lectures/ workshops / seminar	Resource person	Number of participants
1	2015	Workshop on "Mobile Controlled and autonomous Robotics" from April 18-19, 2015	Mr. Saurav Bharadwaj (Techinest)	62
		Workshop on Tall Buildings from May 1-3, 2015	Mr. Ankur Jain (Civil Simplified)	73
		Workshop on Vehicle Overhauling from May 2-3, 2015	Mr. Anish Garg (Prigma Edutech)	76
2	2014	Expert lecture on "Genetic Algorithm", on April 26, 2014.	Prof. G. N. Panda (IIT Bhubaneswar)	42
		Workshop on "Automobile Mechanics & IC Engine Design" by MBS Group during April 26-27, 2014	MBS Group	100
		Workshop on "Industrial Automation (PLC/SCADA System)" by SOFCON Bhopal on April 26-27, 2014.	SOFCON Bhopal	120

3	2013	Workshop on "Cyber security – Ethical Hacking" April 21, 2013.	Mr. Ankit Fadia	180
		Workshop on "Eye-Botics", April 19-20, 2013.	Mr. Sudesh Morey	104
4	2012	Workshop on "Android Application" April 21-22, 2012.	Resource persons from I3India	140

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

- Regular Marker and board
- Exercises in tutorial classes.
- Use of audio visual aids
- Project based learning (Seminars, Minor and Major Projects)
- Case study / peer-reviewed publication based learning
- Technical Papers from IEEE, IET, Springer etc. Journals.

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

The department monitors the learning outcomes through student's progressions (placement/entrepreneurship/higher education). It reviews student class room learning performance in faculty meeting and prepare corrective action plan to address the issues related to the classroom performance of weaker students. Also student learning and course syllabi are reviewed annually taking into consideration of recent developments in the subject areas. Academic Council and department Board of Studies meet regularly to evaluate and provide directive to the department for corrective measures whenever required. This improves the quality in academics as well as in research. Faculty feedback also collected on course syllabi taking into consideration of recent developments in the subject areas. The feedback of the outgoing and alumina and their expectations from the program/course are reviewed regularly in the department faculty meetings. Department hold Board of studies meeting at least once in a year and take expert advice on the syllabi. Necessary recommendations of BOS communicated to Academic Council for consideration. This aids in continuously developing the department's objectives.

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. JUET Youth Club (JYC) is a student body of the University which plans and organize beyond the classroom activities. Department students and faculties actively take part in all the activities planned by JYC in terms of student participation and organizing the events. Besides, the department has a student technical society "IETE Student Forum (ISF)". The ISF plans various technical activities for the department students. Also it organizes the annual technical fest where the allied department students of the JUET also take part along with students from other Universities.

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

Department organizes various **beyond syllabus scholarly activities** for students through ISF activities. These activities broadly divided into three categories as:

- Expert Lectures
- Seminars and workshops
- Techno-cultural fests

Expert Lectures:

Invite subject experts, successful entrepreneurs, industry professional and eminent researchers to deliver motivational talk to develop scientific temper, entrepreneurship among the students and creates awareness on emerging technologies. List of such lectures organized by the department during last five years is given in the Table below.

S. No	Date	Topic	Name of Resource person
1	April 19, 2012	Hit the film and it bends towards you (ion beam induced bending)	Prof. H. C. Verma (IIT Kanpur)
2	April 26, 2014.	Genetic Algorithm	Prof. G. N. Panda (IIT Bhubaneswar)

Seminars and workshops

Various start-up companies currently offers short term training programs for under graduate students on Robotics and Android Applications. Students take lot of interest on these activities and participate in large numbers. Department invite these start-up companies to organize the training programs on the campus for the student to develop entrepreneur skill. List of such training programs organized by the department during last five years is given in the Table below.

S. No.	Date	Name of Company	Number of participants
1	November 29, 2014	Electronics System Design and Manufacturing Workshop (ESDM)", supported by NFL, GAIL.	121
2.	April 26-27, 2014.	Industrial Automation (PLC/SCADA System) by SOFCON Bhopal	120
3.	April 19-20, 2013	Eye-Botics" by Mr. Sudesh Morey on April 19-20, 2013	104
4	April 21, 2013	Cyber security – Ethical Hacking" conducted by Mr. Ankit Fadia	180
5	April 21-22, 2012	"Android Application"	140

Techno-cultural fests

Department supports the annual technical fest named "DEXTRA" organized by ISF. The primary objective of organizing "DEXTRA" is to provide a platform to the student for showcasing their technical skills in terms of model display, programming skill, research ability, knowledge on emerging technologies, and case studies. Department encourages students from allied departments as other nearby technical institutions to take part in DEXTRA. Department acknowledge student skills through certification and motivates students through prizes. The table below gives annual budget expenditure of IET student forum and the number of activities organized for DEXTRA during last five years.

Annual Budget Estimate and Expenditure

S. No.	Year	Budget Estimate (In ₹)	Expenditure of budget (In ₹)
1	DEXTRA 2010-11	1,50,000	131930/-
2	DEXTRA 2011-12	3,00,000	259196/-
3	DEXTRA 2012-13	3,50,000	330875/-
4	DEXTRA 2013-14	4,00,000	330588/-
5	DEXTRA 2014-15	5,00,000	448000/-

Activities organized by DEXTRA

S. No.	Year	Number of technical Events	Number of participants
1	DEXTRA-10	10	400
2	DEXTRA-11	13	550
3	DEXTRA-12	22	750
4	DEXTRA-13	30	890
5	DEXTRA-14	32	1050
6	DEXTRA-15	38	1100

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 faculties put their efforts on preparing the laboratory manuals for conduct of practical courses. The laboratory manuals are self contained especially for design experiments. These laboratory manuals received appreciations from the external experts. Besides, department faculties created new knowledge in terms of quality research publication on the areas of hardware accelerator design, filter/filter-bank design, hand biometric, image denoising, soft computing, microstrip antenna design, device modeling and arithmetic circuit design. The department faculties have made an in depth study on these research problems and come out with various algorithm and architectural design strategies. The research findings are published in high impact journals which reflects the quality of the knowledge produced. The usefulness of the knowledge is reflected through the citations received worldwide.

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

Strengths:

- Qualified and experienced faculty with more than 45% PhD holders.
- Good infrastructure (Audio visual facility in all classrooms, good laboratory facility, library equipped with reference books and research journals)
- Flexibility in updating curriculum
- Presence of core engineering branches
- Fully residential campus
- Good number of national/international collaborations

Weaknesses:

- Ability to attract good employers in core areas of the ECE students
- Ability to attract national/ international funding agencies to support research projects
- Ability to convert research outputs into intellectual property through patent filing.
- Location of the University
- Attracting not enough good students

Opportunities:

- National focus on Electronics Manufacturing
- Collaborative research work with premier / foreign universities
- Possibility interdisciplinary collaborative work with core engineering departments
- Scope for industry funding in research project with the growth of manufacturing sector.

Challenges:

- Teaching engineering topics on emerging technologies to student with low aptitude.
- Creating student interest on studies and motivating them on teaching values.
- Attracting industry to take part in academic research to promote creation of knowledge which will lead the next century.
- Retaining quality faculty.
- Sensitization of students and faculty on ethics and integrity.

52. Future plans of the department

- Strengthen the existing Masters programme through creating better facility and opportunity for research and placement.
- Put efforts to increase collaboration with industry and foreign Universities.
- Put efforts to increase collaboration with top ranked Universities through faculty and student exchange program and collaborative research.
- Visits of eminent researchers will be organized more frequently for faculty recharging.
- International and national events will be organized more frequently to provide the platform to faculty for networking with industry professional and researchers.
- Put efforts to attract national and international funding agency to support research projects.
- Explore new industry demand programs and courses.

Annexure-I/ ECE

List of Publications on Research Collaboration

SCOPUS Indexed International Journal

2015

1 B.K. Mohanty, P.K.Meher and S.K. Patel, "LUT optimization for distributed arithmetic based block least mean square adaptive filter", IEEE Transaction on Very Large Scale Integration Systems, DOI:10.1109/TVLSI.2015.2472964. Sept. 2015, (On-line Available: IEEE Xplore), [Citation Index: 0, SNIP: 2.139, SJR: 0.624, Impact Factor: 1.89, H- Index: 69, SCI].

2 B.K. Mohanty and P.K. Meher, "A high-performance FIR filter architecture for fixed and reconfigurable applications", IEEE Transaction on Very Large Scale Integration System, June 2015, (On-line Available: IEEE Xplore), [Citation Index: 0, SNIP: 2.139, SJR: 0.624, Impact Factor: 1.89, H- Index: 69, SCI].

3 H. Rabah, A. Amira, B.K. Mohanty, S. Maadeed, and P. K. Meher, "FPGA Implementation of Orthogonal Matching Pursuit for Compressive Sensing Reconstruction, IEEE Transaction on Very Large Scale Integration System, vol. 62, no.1, pp. 2209-2220, Oct. 2015, Oct. 2014, [Citation Index: 0, SNIP: 2.139, SJR: 0.624, Impact Factor: 1.89, H- Index: 69, SCI].

4 Amit Mishra, Rajiv Saxena and Manish Patidar, "AGP–NCS Scheme for PAPR Reduction", Wireless Personal Communications (Springer), DOI: 10.1007/s11277-015-2275-8, pp 1-12, January, 2015.[Citation Index:17 , SNIP: 0, SJR: 0, Impact Factor: 0.979, H-Index:2, SCI].

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List of publications in National Conference

2013

1 Gaurav Saxena and Akilesh R. Upadhyay "On Shot- Boundary Detection Techniques for Video segmentation Approaches ", National Conference on Communication, Computing and Networking Technologies (NCCCNT-13), pp113-118, held on 15-16 March 2013 at SGGS Institute of Engineering &Technology, Nanded Maharashtra, India

Annexure-II/ECE

List of faculty Publication without Collaboration

SCOPOUS Indexed International Journals

2015

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1. Shradha Sharma, Divyank Tambi, Shefali Sharma, "Brain Tumor Extraction from MRI images using a hybridized method of K means Clustering, Watershed segmentation and Morphological operations", International Journal of Engineering and Technical Research (IJETR), vol 3, no. 5, May 2015, ISSN: 2321-0869. [Citation Index: 0, SNIP: 0, SJR: 0, Impact Factor: 0, H-Index: 0]

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12. Rahul Kumar Garg, Gaurav Saxena "Shot Boundary Detection Using Shifting of Image Frame", 'International Journal of Scientific Engineering and Technology (IJSET), Vol.3, Issue-6, June 2014 (ISSN: 2277-1581), pp 785-788, 2014. [Citation Index: 0, SNIP: 0, SJR: 0, Impact Factor: 0, H-Index: 0]

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14. Narendra Singh, Anuj Garg, Ankit Saxena and Anupama Arora, "Implementation of optimized trans-multiplexer using combinational window functions", International Journal of Advance Research, vol. 1.no.8, pp.1-5, ISSN: 2320-5407, August 2013. [Citation Index: 0 , SNIP: 0, SJR: 0, Impact Factor: 1.659, H-Index: 0]

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2011

19. Rajesh K. Vishwakarma and Sanjay Tiwari "Aperture coupled microstrip antenna for dual-band operation," Wireless Engineering and Technology, USA, vol. 2, pp. no 93-101, April 2011 (ISSN: 2152-2294). [Citation Index: 0, SNIP: 0, SJR: 0, Impact Factor: 0, H-Index: 0]

20. Rajesh K. Vishwakarma and Sanjay Tiwari "Aperture coupled stacked patch antenna for dual-band," International Journal of Electronics and Computer Science Engineering. vol. 1, no.3 pp. no-933-939 Nov 2011.[Citation Index: 2, SNIP: 0, SJR: 0, Impact Factor: 0.593, H-Index: 0]

21. Satish K. Singh, Shishir Kumar, "Singular Value Decomposition Based Subband Decomposition and Multiresolution (SVD-SBD-MRR) Representation of Digital Color Images", Pertanika Int. J. of Science and Technology, vol.19, no.2, pp. 229-235, 2011. [Citation Index: 0, SNIP: 0, SJR: 0, Impact Factor: 0, H-Index: 0]

22. R. Saxena and H. D. Joshi, "A new peak clipping algorithm for PAPR reduction in OFDM," Electrical and Electronics Engineering, Scientific and Academi Publisher, USA, vol. 1, no. 2, Dec 2011, pp. 49-54. [Citation Index: 0, SNIP: 0, SJR: 0, Impact Factor: 0, H-Index: 0]

23. Satish K. Singh, Shishir Kumar, Rajiv Saxena, "MACSE-CCT (Minimum Average Color Space Entropy-Color Component Transform) Based Color Image Compression*", International Journal of Image and Data Fusion*, vol. 1, no. 4, pp. 309-323, 2010. [Citation Index: 0, SNIP: 0, SJR: 0, Impact Factor: 0, H-Index: 0]

24. Amit Mishra and Zaheeruddin, "Design of Fuzzy Neural Network for Function Approximation and Classification", *International Journal of Computer Science (IJCS),* ISSN Online: 1819-9224), vol. 37, no. 4, pp. 1-15, 2010.[Citation Index: 17, SNIP: 0, SJR: 0, Impact Factor: 0.730, H-Index: 2]

25. Amit Mishra and Zaheeruddin, "Design of Hybrid Fuzzy Neural Network for Function Approximation", Journal of Intelligent Learning Systems & Applications (JILSA), ISSN Online: 2150-8410, Volume 2, Issue 2, pp. 97-109, 2010. [Citation Index:17 , SNIP: 0, SJR: 0, Impact Factor: 1.09, H-Index: 2]

List of publications in International Conference

2015

1. Vinay Sharma and Rajesh K. Vishwakarma," Microstrip antenna with defected ground structure (dgs) for multiband operation, "International conference on recent cognizance in wireless communication & image processing on 16-17 Jan 2015 Jaipur India Organized by Poornima Institute of Engineering and Technology Jaipur. pp no. 71

2014

2. Ananti Gupta, Anjani Kumar, Amit Verma , Rajesh K. Vishwakarma, "Rectangular microstrip antenna with feed angle variation" AICTE sponsored international conference on instrumentation, communication, electrical & electronics organized by department of electronics shri, Vaishnav institute of technology and science, Indore, Madhya Pradesh, India, 23-25 January, 2014, PP No. 45

3. Nafis uddin Khan, K. V. Arya and Manisha Pattanaik, "Efficient Image De-noising and Edge Enhancement by Singular Value Decomposition on Anisotropic Diffused Image Data", In proceedings of Ninth IEEE International Conference on Industrial and Information Systems (ICIIS 2014), December, 15-17, 2014, ABV-Indian Institute of Information Technology and Management, Gwalior, India (IEEE Explore).

2013

4. Shivkant Thakur, Rajesh K. Vishwakarma and K.K Verma, "L-shaped microstrip antenna for wideband," The International Conference on Communication Systems and network Technologies (CSNT-2013 at Gwalior) on 6-8 April 2013 (on IEEE Xplore) pp no. 41-43.

5. Rajesh K. Vishwakarma and K.K Verma, "Electromagnetically coupled square microstrip antenna for dual-band operation," The International Conference on Communication Systems and network Technologies (CSNT-2013 at Gwalior) on 6-8 April 2013. (IEEE Xplore) pp no. 44-46.

6. Prakash Kumar Mishra ,Ritu Raaj , Preeti Maddhyeshia, Rajesh K. Vishwakarma, Design of dual band slot loaded rectangular microstrip antenna for global positioning satellite,"The International Conference on Communication Systems and network Technologies (CSNT-2013 at Gwalior) on 6-8 April 2013. (IEEE Xplore) pp no. 37-40

7. Dhaval Dhupar, Prateek Chandra, Rahul Anand, Rajesh K. Vishwakarma, "Microstrip antennawith hexagonal slots for UWB applications," The International Conference on Communication Systems and network Technologies (CSNT-2013 at Gwalior) on 6-8 April 2013 (IEEE Xplore) pp no. 33-36

8. Anand Sharma, Rajesh K. Vishwakarma,"Microstrip antenna with swastik slot for UWB applications,"9th International conference on Microwave, Antenna Propagation & Remote Sensing (ICMARS2013) Organized by International Centre for Radio Science Jodhpur,India dated on 11 -14 December 2013.(Paper is accepted for oral presentation)

9. Vaibhav Mishra, Pragati Rana, Priya Keerti Tripathi, Hem Dutt Joshi, "Performance Analysis of Comb Type Pilot Aided Channel Estimation in OFDM with Different Pilot Sequences," in the Proceeding of Tenth IEEE International Conference on Wireless and Optical Communications Networks (WOCN-2013), 26-28 July, 2013, TIT College, Bhopal, M.P, India, IEEE Catalog Number: CFP13604-CDR 978-1-4673-5997-9.

10. Saraswati Kumari, Shivesh Kr. Rai, Atul Kumar, Hem Dutt Joshi, Ashutosh Kr. Singh, Rajiv Saxena, "Closed Form Relations for ICI and BER in FRFT Based OFDM System", in the Proceeding of 3rd IEEE International Advance Computing Conference, (IACC-2013), Feb 22-23, 2013, Ajay Kumar Garg college of Engineering, Ghaziabad (UP), India.

2012

11. Amit Mishra, Khushboo Pachori, "Design of FIR Digital Filters Using ADALINE Neural Network", IEEE International Conference on Computational Intelligence and Communication Networks (CICN-2012), Mathura, Uttar Pradesh, pp. 800-803, ISBN:---, November 3-5, 2012.

12. Deepak Jain, Gaurav Saxena, and Vineet kumar Singh, "Image Mosaicing by Corner Techniques", Proceedings of IEEE International Conference on Communication Systems and Network Technologies (CSNT-2012), , pp 79-83, held on 11-13 May 2012 at Rajkot, India. ISBN: 978-0-7695-4692-6 DOI: 10.1109/CSNT.2012.27 [IEEE xplore]

13. Deepak Kumar Jain, Gaurav Saxena & Vineet Ku. Singh 'A novel Still image Mosaic Algorithm construction Using Feature Based Method ', 'International Conference on Electronics & Communication Engineering' Proc. ICECE-2012, pp59-63, Inter Science Research Network (India) Bhubaneswar, March 3, 2012.

14. Ravi Kumar, Rajiv Saxena, "MIMO Capacity Analysis using Novel Adaptive Semi Blind Estimation Scheme for Spatial Channel", IEEE International Conference on Advances in Mobile Network, Communication and its Applications–MNCApps2012, sponsored by ACEEE, Bangalore, India, 2012, pp.54-59.

2011

15. Rajesh K. Vishwakarma and Sanjay Tiwari, "Aperture coupled microstrip antenna for dual-band operation." IEEE AP-S International Symposium on Antennas and Propagation and 2011 USNC/URSI National Radio Science Meeting in Spokane, Washington, USA July-3-8, 2011. [Paper Accepted for presentation]

16. H. D. Joshi and R. Saxena, "PAPR reduction in OFDM systems using precoding with clipping," IEEE International Conference on Communications, Computing and Control Applications (CCCA'11), 03-05 March 2011, Hammamet, Tunisia. [IEEE xplore]

2010

17. Anurag Mahajan and B.K.Mohanty, Efficient VLSI architecture for implementation of 1-D discrete wavelet transform based on distributed arithmetic, In Proc. IEEE Asia Pacific Conference on Circuit and Systems, APCCAS-2010, pp. 1195-1198, Malaysia, Dec. 2010, (IEEE Xplore), [Citation Index: 1, SNIP: 0, SJR: 0.15, Impact Factor: 0.27, H- Index: 14].

18. Rajesh K. Vishwakarma and Sanjay Tiwari "Analysis of rectangular notch antenna for dual-band operations" Scientific Research in Engineering, USA, vol.2, No. 2 , pp. no 91-96, Feb.2010 (ISSN 2229-5518).

19. Rajesh K. Vishwakarma and Sanjay Tiwari "Experimental study of stacked rectangular microstrip antenna for dual-band" Scientific Research in Engineering, USA, vol.2, No. 2, pp. no 85-90, Feb.2010 (ISSN 2229-5518)

20. Singh Satish K., Kumar Shishir, “Performance Analysis of Color Space Transform on Digital Color Image Compression”, in Proc. Of 1st Int. Conf. on Computational Vision and Robotics (ICCVR-2010), pp. 247-258, Aug 21-22, 2010.

21. Shishir Kumar, Satish Kumar Singh, “Study and Implementation of Entropy Encoding System for Image compression”, in Proc of 3rd IEEE conference on emerging trends in engineering and technology (ICETET-2010), pp.186-191, Nov 19-21, 2010.

22. Amit Mishra, Zaheeruddin, “Hybrid Fuzzy Neural Network based still Image Compression”, IEEE International Conference on Computational Intelligence Communication Networks (CICN-2010), Bhopal, Madhya Pradesh, pp. 116-121, ISBN:---, November 26-28, 2010.

23. Dhruv Gakkhar, Shikhar Samant, Varun Sharma, Satish K. Singh, “Compression Resistant Multichannel Color Image Watermarking”, in Proc of IEEE conference on Signal and Image Processing (ICSIP-2010), pp.186-191, Dec 15-17, 2010.

24. Ravi Kumar, Rajiv Saxena, "Implementation of Blind Sequence Detection for Time Varying Channel in the Analysis of MIMO Capacity for Spatial Channel Model with Partial CSI Knowledge," ACEEE sponsered International Conference on Advances in Communication, Network, and Computing, Kerala, India, pp.41-45,2010

25. Deepak Sharma, Ravi Kumar, "Design and analysis of five element microstrip log-periodic antenna”, IEEE International Conference on Applications of Electromagnetism and Student Innovation Competition Awards (AEM2C), Japan. pp. 210-214, 2010.

26. Ravi Kumar, Rajiv Saxena, Abhay Sah, Saroj Gupta, Tapesh Chandgothia, "Performance of Dynamic MIMO Systems in Presence of Nakagami Fading Channel," IEEE 2nd International Conference on Computational Intelligence, Communication Systems and Networks, Liverpool, United Kingdom, pp. 369-372, 2010.

List of publications in National Conferences

2015

1. Rajesh K. Vishwakarma and Vinay Sharma,” Multiband microstrip antenna with defected ground structure (DGS), “National conference on recent advances in microwave Engineering during 28 Feb-01March 2015 Organized department of Electronics Engineering, Madhav Institute of Technology & Science, Gwalior India PP Paper Presented [Paper ID RAMWE126]

2. Sanjeev Kumar, Rajesh K. Vishwakarma and Ravi Kumar, "Fractal O-shape UWB Antenna, "National conference on recent advances in microwave Engineering during 28 Feb-01March 2015 Organized department of Electronics Engineering, Madhav Institute of Technology & Science, Gwalior India PP Paper Presented [Paper ID RAMWE125]

3. Akshansh Kumar, Rajesh K. Vishwakarma, Neha Kumariand and Poonam, "Comparison of impedance bandwidth for different size of equilateral triangular slot in square patch, "National conference on recent advances in microwave Engineering during 28 Feb-01March 2015 Organized by department of Electronics Engineering , Madhav Institute of Technology & Science, Gwalior India PP Paper Presented [Paper ID RAMWE124]

2013

4. Rajesh K. Vishwakarma, "Square microstrip antenna for dual-band operation," National Conference on Environmental Sustainability and society: The Growing Paradigm Shift (ESS 2013) Organized by Jaypee University of Engineering and Technology, Raghogarh Guna, on 30-31, March 2013, Paper presented.

2012

5. Rajesh K. Vishwakarma, Nadia Shaheen, Navodit Aggarwal, Arjun Sharma, K.K Verma and Sanjay Tiwari, "Slot loaded fork shaped antenna for Bluetooth and dual-band Applications," Proceeding of National Conference on Emerging Trends in Electrical Instrumentation & communication Engineering (ETEIC-2012) jointly Organized by Anand Engineering College, Agra & Institute of Engineers (India) Aligarh Centre pp no.143-145 on 6-8 April 2012.

6. Rajesh K. Vishwakarma and Sanjay Tiwari, "Aperture coupled microstrip antenna for dual-band" Proceeding of National Conference on Emerging Trends in Electrical Inst. & communication Engineering (ETEIC-2012) jointly Organized by Anand Engineering College, Agra & Institute of Engineers (India) Aligarh Centre pp no.137-142 on 6-8,April 2012.

7. Rajesh K. Vishwakarma, Hemdutt Joshi K.K Verma and Sanjay Tiwari, "Design of rectangular patch antenna with u-slot," Proceeding of National Conference on Emerging Trends in Electrical Instrumentation & communication Engineering (ETEIC-2012) jointly Organized by Anand Engineering College, Agra & Institute of Engineers (India) Aligarh Centre pp no.146-147 on 6-8April 2012.

2011

8. Shashank Gupta, Shivam Mishra, Rajesh K. Vishwakarma and K.K Verma "Rectangular microstrip antenna in S band" National Conference on recent advances in microwave Engineering, Organized by Department of Electronics MITS Gwalior, pp. 01, 16- 17 Dec. 2011.

9. Rajesh K. Vishwakarma and Sanjay Tiwari, "Air gap aperture coupled microstrip antenna for dual-frequency" National Conference on recent advances in microwave Engineering, Organized by Department of Electronics MITS Gwalior, pp. 60. 16-17 Dec. 2011.

2010

10. Rajesh K. Vishwakarma "Rectangular notch antenna for dual-band operation" Third Annual Conference (ATMS-2010) Antenna Test & Measurement Society, New Delhi pp. no. 79-81, 11-13 Feb. 2010

11. Rajesh K. Vishwakarma and Sanjay Tiwari "Dual-band stacked rectangular microstrip antenna for mobile application," (ATMS-2010) Antenna Test & Measurement Society New Delhi pp. no. 137-139, 11-13 Feb 2010

12. Hem Dutt Joshi, Rajesh K. Vishwakarma. Ashutosh Singh, "Design and analysis of rectangular patch with U-slot," National Conference on Recent Trends & Challenges in internet Technology (RTCIT-2010) Organized by Department of CSE & IT NIT Bhopal 19-20 Mar. 2010.

13. Rajesh K. Vishwakarma and Sanjay Tiwari, "Notch microstrip antenna for dual-band operation," National Conference on Recent Trends & Challenges in internet Technology Organized by Department of CSE & IT NIT Bhopal, pp. no.144-146. 19-20 Mar. 2010

14. Rajesh K. Vishwakarma and Sanjay Tiwari, "Microstrip antenna for dual-band operation," National Conference on Recent Advances in Materials Science & Engineering [RAMSE2010] Organized by Jaypee University of Engineering and Technology, Raghogarh Guna, on 23-24, Oct. 2010, Paper presented

15. Anurag Mahajan and B.K.Mohanty, "Bit serial design for VLSI implementation of 1-D Discrete Wavelet Transform using 9/7 filters based on Distributed Arithmetic," In Proceedings of Third CSI National Conference on Education and Research (ConfER) 2010, pp 439 -449, 6-7 March 2010. ISBN: 978-0230-32925-6.

16. Ravi Kumar and Rajiv Saxena, "Transformation of Mutual Coupling between the transceivers of MIMO system for time varying channel with partial CSI knowledge and its effect on its capacity", IETE sponsored National Conference on Electronics, Computers and Communications (NCECC-2010), DRDE Gwalior, 6-7 March,2010.

Annexure-III/ECE

Conferences, Workshops, Seminars attended by faculty outside JUET

Workshop

(a) International

Prof. B. K. Mohanty

- Attended one day Workshop "Novel Technologies for Clinical Practice in Neurology" jointly organized by Massachusetts General Hospital (MGH), Harvard Medical School (HMS) and VALENS, School of Electrical and Electronics Engineering, Nanayang Technological University, Singapore, on March 17, 2015
- Attended one day Workshop on "European Research Funding" Organized by European Research Council at INSEAD Asia Campus, Singapore on Feb. 11, 2015

Dr. Jitendra Kanungo

- Attended workshop on "Advanced Topics in *VLSI* Circuit Design", on *September* 18-20*, 2014,* organized by *IIT Roorkee and sponsored by* IEEE CAS.

Mr. Subodh K. Singhal

- Attended workshop 2012 on "Device Modeling for Microsystems", on April 16-18, 2012, organized by JIIT, Noida *and sponsored by* MOS-AK/GSA.

(b) National

Prof. B. K. Mohanty

- Attended five days short term course on "Image Processing and Digital Communications" ,Organized by Indo-US Engineering Faculty Leadership Institute at JUET Guna, M.P India, during the June 6-10,2011.
- B.K.Mohanty attended six days workshop on "Digital Signal & Image Processing", Oragnized by Department of ECE ,JUET,Guna at JUET, Guna from 5-10 July 2010.

Dr. Narendra Singh

- Attended five days short term course on "Image Processing and Digital Communications" ,Organized by Indo-US Engineering Faculty Leadership Institute at JUET Guna, M.P India, during the June 6-10,2011.
- Narendra Singh attended six days workshop on "Digital Signal & Image Processing", Oragnized by Department of ECE ,JUET,Guna from 5-10 July 2010.

Dr. Rajesh K. Vishwakarma

- Attended workshop on "Computational Electromagnetic and RCS Prediction for Stealth Applications", on September 24-28, 2012, organized by Defense Laboratory Jodhpur.

Dr. Ravi Kumar

- Ravi Kumar attended three days workshop on "Advances in network communication and Security", Organized by Department of CSE, JUET, Guna at JUET, Guna from 19-21 December 2013.
- Attended five days short term course on "Application Oriented Networking", Organized by Indo-US Engineering Faculty Leadership Institute at JUET Guna, M.P India, during the July 9-13, 2013.
- Ravi Kumar attended one day workshop on "Ethical Hacking", Organized by IETE, JUET, Guna at JUET, Guna on 21st April, 2013.
- Attended five days short term course on "Image Processing and Digital Communications" ,Organized by Indo-US Engineering Faculty Leadership Institute at JUET Guna, M.P India, during the June 6-10,2011.
- Ravi Kumar attended six days workshop on "Digital Signal & Image Processing", Organized by Department of ECE, JUET, Guna at JUET, Guna from 5-10 July 2010.

Dr. Nafis Uddin Khan

- Attended a training programme on "How to get published in Internationally Referred Journals", on March 21, 2010 organized by in ABV-IIITM, Gwalior.
- Attended a training programme on "LaTex: Language of Scientific Writing: A Practical Guide", on September 04-05, 2010 organized by ABV-IIITM, Gwalior.

- Attended national workshop on "Meta-Heuristics and IT Researchers", on November 22-23, 2010 organized by ABV-IIITM, Gwalior.

Dr. Rahul Pachauri

- Attended workshop on "Signal processing", on December 4-6, 2014, organized at Samrat Ashok Technological Institute (SATI) Vidisha (M.P.) conducted by TEQIP-II and IET.
- Attended workshop on "Signals & Systems", on Jan. 2-12, 2014, organized by IIT Kharagpur under the National Mission on Education through ICT (MHRD, Govt. of India at SATI, Vidisha (M.P.).
- Attended workshop on "Teaching Engineering Using MATLAB & SIMULINK", on July, 5-7, 2011 Jaipur Engineering College & Research Centre (JECRC), Jaipur and organized by IUCEE.

Mr. Gaurav Saxena

- Attended workshop on "Deployment and use of NPTEL Courses", on March 31-April 01, 2012, jointly organized by IIT Kanpur & PDPMIITDM Jabalpur.
- Attended workshop on "Latest Trends in Digital Signal Processing Applications", on October 05, 2013, organized by Department of Electronics MITS Gwalior.

Mrs. Ranu Gupta

- Attended workshop on "Signal processing", on December 4-6, 2014, organized at SATI Vidisha (M.P.) conducted by TEQIP-II and IET.

Conference

(c) International

Prof. B. K. Mohanty

- Attended three day International Conference on "Communication and Signal Processing", Organized by JIIT, Noida, Noida, India during Dec.14-16, 2013
- Attended three day IEEE Sponsored International Symposium on "Design and Test," Jointly organized by Texas A&M, Qatar and Qatar University, Doha, Qatar during Dec.15-17, 2012

Dr. Anurag Mahajan

- Attended conference on "Asia Pacific Conference on Circuit and Systems", on December 7-9, 2010, at Kualalumpur, Malaysia and organized by IEEE.

Dr. Rahul Pachauri

- Attended conference on "IEEE International Conference on Communications, Computing & Control Applications", on March 3-5, 2011 at Hammamet, Tunisia.

Dr. Nafis Uddin Khan

- Attended Conference "Soft Computing for Problem Solving", on December 20-22, 2011, organized by Indian Institute of Technology, Roorkee.
- Attended 8th Indian Conference "Vision, Graphics and Image Processing (ICVGIP 2012)" on December 16-19, 2012 organized by Indian Institute of Technology, Bombay.
- Attended 9th IEEE International Conference "Industrial and Information Systems (ICIIS 2014)" on December 15-17, 2014, organized by ABV-IIITM, Gwalior.

(d) National

Mr. Gaurav Saxena

- Attended conference on "Communication, Computing and Networking Technologies (NCCCNT-13)", on 15-16 March 2013, organized by Department of Electronics & Telecommunication at SGGS Institute of Engineering &Technology, Nanded Maharashtra, India.