Spandhan

ISSUE 1 | Volume 1 | 2022
(JAN 2021 - DEC 2021)

MESSAGE FROM THE HEAD

It is my pleasure and honour to welcome you to the Department of Electronics and Communication Engineering of Maharaja Agrasen Institute of Technology which is one of the premier institutions of North India, unique like a prism reflecting the manifold shades of learning and co-curricular activities.

The Department of Electronics and Communication Engineering bequeaths students with the capability to apply knowledge of Electronics and Communication Engineering to work efficiently in multidisciplinary teams, endow with leadership and technical expertise, and practice engineering with ethical approaches.

The Department has excellent lab facilities which are being upgraded from time to time and provide ample opportunities for the students to learn and innovate. The Department organizes interactive lectures and Faculty Development Programs/ Seminars by inviting Educationists and Technocrats from industries for the overall development of students as well as for faculties.

This newsletter provides an overview of the academic progress, research activities, various workshops/FDPs and faculty member's research updates. I hope that whether you are a prospective undergraduate or graduate student, or work in industry, or another Institute/University, or a visitor, you will find this newsletter informative.

Dr. Sunil Kumar
HOD ECE

IN THIS ISSUE

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY
MAIT
उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः

The official newsletter
of
Department of Electronics and Communication Engineering
MAIT, New Delhi

National Seminar

on

Latest Trends in Laser Technology and Fibre Optics Communication

A two day National Seminar on Latest Trends in Laser Technology and Fibre Optics Communication, was organized by the department of Electronics and Communication Engineering at Maharaja Agrasen Institute of Technology, Rohini, Delhi from 25th March 2021-26th March 2021. The seminar was sponsored by IEEE EDS Delhi Chapter and DRDO, Ministry of Defense, Govt. of India. The idea of the seminar was to bridge the gap between the concepts being taught at the graduate level in the institute and the recent advancements that are taking place in the market, the relevant industrial requirements and the areas of research in the field of Lasers and Optical fibres.

Keeping in mind the safety and security of the participants in the times of the pandemic Covid-19,the seminar was organized in both offline and online mode. Around 60 faculty and staff members had attended the two day seminar offline and more than 600 students of 4th,6th and 8th Semester of the ECE department had joined the seminar online through Youtube. The spectrum of the speakers stretched from including the professors/academicians from the institute of repute to the scientists from eminent research laboratories.

Prof. R.S Gupta delivered the welcome address in which he discussed about the importance of LASERS in various fields of technologies currently and the need for constant research and development in this field. The formal inaugural ceremony of this two day event was followed by the addresses from the Director of the Institute- Prof. Neelam Sharma, Executive Chairman of MATES- Shri S.P Aggarwal and Founder & Chief Advisor MATES- Dr. Nand Kishore Garg, Dr. S. S Deswal- Dean Academics MAIT and all head of departments. The Thank You address was delivered by the Head of the Department, Electronics and Communication Engineering- Prof. Sunil Kumar. Eminent speakers from the field of Electronics discussed and shared their

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

MAIT

उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः

The official newsletter of Department of Electronic and Communication Engineering, MAIT, New Delhi

FACULTY DEVELOPMENT PROGRAMME

*On **Robotics**, organized with the help of ATAL Platform*

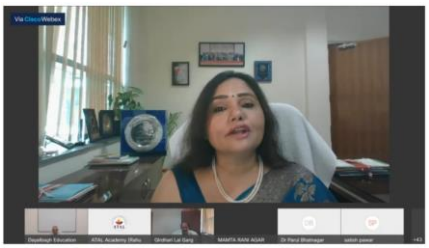
AICTE Training And Learning Academy

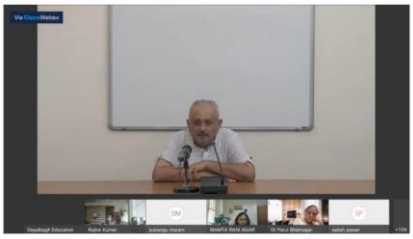
The recent changes in the industrial scenario has made industrial automation an emerging field for students, teachers as well as researchers. Main area of discussion was on Robotics, it's advances and applications. The topic ranges from Inverse and Velocity Kinematics, Robotics and Mechatronics in Medicine, Robot Motion Visualization, Collision Free Trajectory Planning, Robotics 2 Rural -Innovative Teaching and Research Approaches, Modular Robotics: Importance and connection to Industry 4.0, and Bionic Manipulators. In this FDP we also provided an exposure to the hands-on sessions on RoboAnalyzer V7.5 along with industrial applications. In this direction, MAIT organized AICTE Training and Learning (ATAL) program for faculty development sponsored by AICTE on "Robotics" from 23 August to 27 August 2021. The prominent speakers of the FDP was Prof. Sunita Chauhan, Monash University, Australia, Prof. (Dr.) S. K. Saha, IIT-Delhi, Prof. (Dr.) Pushparaj Mani Pathak, IIT-Roorkee, Mr. Usman Ali, Festo India etc.

The inauguration was held on 23rd August 2021 online at 11:00 am. Chief Guest of the program was Prof. Prem Kumar Kalra, (Director, Dayalbagh Education institute) Guest of Honour of the function were Prof. Rajive Kumar (Member Secretary, AICTE) and Dr. Mamta Rani Agarwal (Adviser-I, ATAL Academy), Dr. Amit Dutta (Deputy Director, ATAL AICTE) and Coordinator chaired the function. Also, Directors of different academies, and AICTE officials were also present with the participants. Adviser-I, ATAL Academy, Dr. Mamta Rani Agarwal addressed the participants about online FDP and various initiatives by ATAL Academy. Dr. Amit Dutta, Deputy Director, ATAL AICTE, proposed the Vote of Thanks.

Total 116 participants applied for the FDP and 93 participants successfully completed it. It was organized by a joint team of MAE Department and ECE Department of Maharaja Agrasen Institute of Technology, Delhi under the aegis of ATAL.

"Robotics is not just about automation but intelligent automation"





MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

MAIT

उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः

The official newsletter of Department of Electronic and Communication Engineering, MAIT, New Delhi

INTERNATIONAL CONFERENCE ON INDUSTRIAL ELECTRONICS RESEARCH AND APPLICATIONS (ICIERA- 2021)

22nd to 24th December 2021, Delhi. Maharaja Agrasen Institute of Technology, Rohini, in association with IEEE Delhi Section organized an International conference on Industrial Electronics Research and Applications (ICIERA- 2021) during 22nd -24th December, 2021. Under the aegis of Maharaja Agrasen Technical Education Society, it was held in the Department of Electronics and Communication Engineering, in hybrid mode and was also transmitted live on official MAIT YouTube channel. The objective of this conference was to discuss new technologies like Green communication systems and wireless sensor networks. Research papers related to building and implementation of smart systems, like electric vehicle, Industry 4.0 and smart machines, as delivery robots and drones were presented. This facilitated participants to enhance their knowledge about 21st century challenges and work in the direction of betterment of human society.

In the inauguration ceremony, held on 22nd December, 2021, in MAIT campus, Dr. Nand Kishore Garg, Chief Patron ICIERA- 2021, Founder and chief advisor-MATES, Chancellor MAU, and Shri. S. P Agarwal, Executive Chairman, MATES motivated the participants with their kind words. Director MAIT Prof. Neelam Sharma highlighted the potential of such events that help to share knowledge and experience amongst the students as well as researchers.

Chief Guest for the ceremony, Prof. Venugopal Achanta, Director NPL and Guest of Honour Prof. A.P. Mittal and Prof. Singam Jayantu highlighted the necessity for skill enhancement through research and risk handling as a mantra for success and transformation of future innovators. In the opening remarks of the conference Dr. Nitin Sharma, organizing chair ICIERA 2021, introduced the conference consisting of six tracks where out of 199, around 57 papers were presented, as per the IEEE standards.

At the end of the session, Prof. Sunil Kumar, Head of Dept., ECE presented Vote of Thanks to MATES management members, Speakers, faculty members and all the participants for attending and gracing the occasion. Event was a grand success with more than 200 participants. During these three days, we have been very fortunate to come across various eminent people from academics and industry and thus be benefitted from their experiences.

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY
MAIT
उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः

The official newsletter of Department of Electronic and Communication Engineering, MAIT, New Delhi

During this 3-day conference, various eminent people from academics and industry participated and shared their research experiences. Prof Bhim Singh, IIT-Delhi, Prof. Prerna Gaur, Director, NSUT East campus, and Prof. Pierluigi Siano, University of Salerno, Italy enlightened the participants about trending technologies and their application in the real world. During the valedictory function, held on 24th December, 2021, the closing remarks were presented by Prof. Sunil Kumar, Conference Chair, ICIERA- 2021. The efforts were appreciated by Chief Guest of the day, Prof Amit Prakash, GGSIPU. The conference concluded with vote of thanks, extended by Organizing chairs of the event, Dr. Nitin Sharma and Dr. Rohit Rana.

TECHNICAL ARTICLE

5G: NEXT GENERATION WIRELESS NETWORKS

The official newsletter of Department of Electronic and Communication Engineering, MAIT, New Delhi

The rapid growth in usage of mobile devices such as smartphones, laptops and tablets has led to explosion of data traffic in wireless networks. The mobile data traffic is expected to grow seven-fold between 2017 and 2022. Cisco's Visual Networking Index (VNI) forecasts that mobile data traffic is expected to reach 77.5 exabytes per month by 2022. The next-generation 5G cellular networks aims in providing very high data rates (typically of Gbps order), extremely low latency, increase in system capacity and significant improvement in users' quality of service (Qos) compared to 4G LTE wireless networks. The three big technologies such as Network Densification, Massive MIMO and mm-wave communication has been the emerging force which has laid the foundation for rolling out of 5G Wireless networks. Network densification and heterogenous cellular networks (HCNs) supports 1000-fold increase in throughput in the fifth generation (5G) cellular networks. HetNets are typically composed of small cells, having low transmission power, besides the legacy macrocells. By deploying low power small BSs, network capacity is improved and the coverage is extended to coverage holes. Moreover, the overlap of small, pico, femto cells with the existing macro cells, leads to improved and efficient frequency reuse Millimeter wave (mm-wave) communication is also seen as a promising technology in next-generation wireless networks to increase the coverage and system capacity. The mm-wave communication system employs millimeter-wave frequencies between 30 and 300 GHz which offers greater bandwidths as compared to 4G LTE cellular networks. With the advancement in physical and MAC layer technologies, like mm-wave spectrum, multiple antennas, small cells, adaptive beamforming, massive MIMO, SDMA, cognitive radio, STR, 5G networks are expected to bring a big paradigm shift in the communication industry, while introducing novel applications. A wide variety of new emerging applications like Internet of Things (IoT), Internet of vehicles (IoV), Device to Device (D2D) communications, ehealthcare, Machine to Machine (M2M) communications and Financial Technology (FinTech). D2D is the major guiding force behind the commercial roll out of 5G wireless systems.

The growth in cellular networks has also led to increase in energy consumption and greenhouse gas emissions. The Information and Communications Technologies ICT cause around 2-4% of all carbon footprint. This topic has been studied under 'Green Communications'. Network operators are now realizing the importance of using energy efficient cellular networks and reducing the CO2 emission levels simultaneously. The research in wireless networks is now taking place to simultaneously meet the challenges posed by explosion in wireless data traffic and escalation in energy consumption. The metric energy efficiency EE has gained many interests recently owing to increase in power consumption of the wireless network.

The optimization of EE can also reduce the electricity costs which forms the significant portion of operational expenditure OPEX in cellular networks . As a result, the terminology 'Green Radio' has become inevitable trend in the past few years for designing energy-efficient wireless network. The researchers all over the world are making efforts to place emphasis on EE as an important design metric in future wireless networks. As indicated in energy consumed by base stations BSs accounts for almost 60% of the total energy expenditure by cellular networks. One of the solutions to save the energy consumption of BSs is to switch the BSs into low energy sleep mode when there is lower traffic demand.

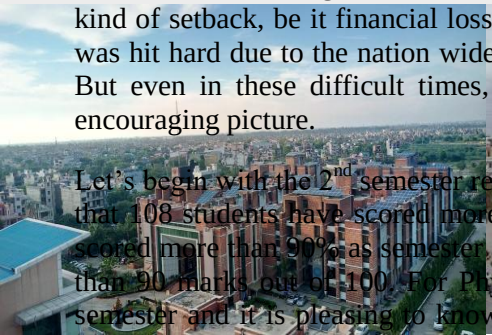
Ultra-high data rates, extremely low latency, anywhere anytime coverage, huge energy saving most of the promises made by 5G are associated with their respective challenges. The very first challenge is to analyze the physics behind mm-waves, like atmospheric absorption, diffraction, propagation, Doppler, scattering, refraction, reflection, multipath and attenuation. Another serious challenge is to realize the

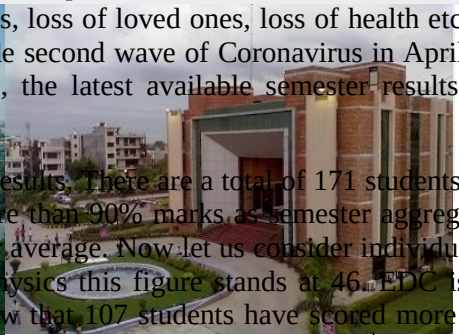
The official newsletter of Department of Electronic and Communication Engineering, MAIT, New Delhi

STUDENTS

ACADEMIC ACHIEVEMENTS

We have been dealing with the COVID pandemic for about a little less than two years now. Everybody has suffered some kind of setback, be it financial loss, loss of loved ones, loss of health etc. Students have been no exception to this. India was hit hard due to the nation wide second wave of Coronavirus in April/May while semester exams took place in June. But even in these difficult times, the latest available semester results (June 2021 end term exams) have shown an encouraging picture.





Let's begin with the 2nd semester results. There are a total of 171 students in this semester and it is quiet satisfying to note that 108 students have scored more than 90% marks as semester aggregate. It means that about 63% of the entire class scored more than 90% as semester average. Now let us consider individual subjects. In Math's, 113 students scored more than 90 marks out of 100. For Physics this figure stands at 46. EDC is counted amongst a challenging subject of 2nd semester and it is pleasing to know that 107 students have scored more than 90 for this subject. The below table shows

The official newsletter
of
Department of Electronics
and Communication
Engineering,
MAIT, New Delhi

Next on our list are the results of 6th semester. It is very pleasing to note that out of 202 students of this semester, 196 have scored more than 80% as semester average. This is quite satisfactory provided the fact that 6th semester has several core subjects of ECE that are known to give the students a hard time. For the 85% and 90% level of semester average, the corresponding figures stand at 173 and 51 respectively. Apart from regular academics, students of this semester

are usually engaged in various other activities as well which are important for their future careers as they prepare themselves to pass out in about a year more. It is not uncommon to observe that several students are preparing for the prestigious examinations such as GATE, CAT, TOEFL, etc. and simultaneously readying themselves for placements. Yet despite this busy itinerary, it is good to know that even in core subjects of 6th semester students have outshined once again. In Microwave Engineering, 53 students got more than 90 out of 100 while for VLSI this figure was 60. Below table mentions the total number of students who got more than 90 in individual subjects of 6th semester.

53	40	21	60	68	74	68	75	55	60	72
MW ENG	ITC	DSP	VLSI	DCN	AWP	MW LAB	VLSI LAB	DSP LAB	DCN LAB	SUMMER TRAINING

Finally, let's talk about the 8th semester results. This year, 198 students passed out from ECE department. It is outstanding to learn that 102 students got more than 80% as semester average. And for the 85% level and 90% level, the number stands at 176 and 102 respectively. It is during the course of 8th semester that students appear for the GATE examination and simultaneously the placements are also under progress. Despite this hectic schedule our students have excelled with fine scores. For example, 141 students scored more than 90 out of 100

The official newsletter of Department of Electronics and Communication Engineering, MAIT, New Delhi

STUDENTS PLACEMENTS HIGHLIGHTS

S.NO	Company	No of Students	Salary in L.P.A
1	Amazon	1	31
2	Amazon	1	17
3	ZS Associates	3	12
4	Sapient	2	6
5	Cognizant GenC	39	4
6	College Dunia	1	4.5
7	DXC Technology	7	3.5
8	INFOSYS (SE Profile)	31	3.6
9	INFOSYS (SES Profile)	10	5
10	INFOSYS (Specialist Programmer)	4	8
11	TCS (Ninja)	38	3.5
12	TCS (Digital)	4	7
13	CINIF Technologies	6	3.5
14	HCL	4	3.5
15	WIPRO	2	3.5
16	LocoNav	4	7
17	Accenture	16	4.5
18	Wiley Mthree	1	8
19	Nagarro	1	3.5

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

MAIT

उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः

The official newsletter of Department of Electronic and Communication Engineering, MAIT, New Delhi

FACULTY UPDATES

S.No.	Faculty and Research Particulars
1)	**Name:** Dr. S.K. Kundu **Title:** PATCH ANTENNA CONFORMABLE TO PLANAR AND NON-PLANAR SURFACE **Date of Award of Degree:** 05th April, 2021 **From:** Deptt. of Electronics engineering, Madhav Institute of Technology and Science Gwalior MP. **About Thesis:** This thesis presents a new concept to design circularly polarised conformal non planar antenna. Achievement of circular polarisation in conformal non planar patch is a herculean task due to infinite number of non uniform surface. However, for the production of circular polarisation, a huge number of iteration techniques have been used with a range of parameters, especially the radius of curvatures. The radius of curvatures of slotted patch and ground plane acts a significant function for the production of circular polarisation. Of course this requires huge parametric studies in terms of return loss, axial ratio, gain and beam width.
2)	**Name:** Dr. Anubha Goel **Title:** Modeling, Simulation and Characterization of Different Surrounding Gate (SG) MOSFET Architectures for GIDL Reduction and High Frequency Applications. **From:** Banasthali Vidyapith **Date of Award of Degree:** 23rd Aug 2021 **About Thesis:** Continuous market demand motivates device engineers to make Integrated Circuits (ICs), which are area efficient and low power dissipating, with reduced fabrication complexity. Increasing demands of semiconductor chips have sent the nano electronics technology near to the atomic/physical device limitations. Integrated circuit industry has shown a lot of technological progress since past few decades. The Metal Oxide Semiconductor Field Effect Transistor (MOSFET) is a central component of Integrated Circuit (IC). The integrated circuit had advanced with double the number of on-chip transistors every generation, thus reducing the physical device size. Scaling is the major factor

S.No.	Faculty and Research Particulars
3)	**Name:** Dr. Rajni **Title:** Algorithms for Sparse System Identification **Date of Award of Degree:** 22th September, 2021 **From:** Dwarka Campus, GGSIP University **About Thesis:** Sparse system identification has gained much interest in adaptive filtering because of many applications. In the last decade, sparse system identification has been extensively employed in signal processing usages such as echo cancellation, CDMA, wireless communication, and multipath propagation. The above algorithms can help the designer to choose a suitable algorithm based on different objective criteria for sparse system identification. Although several algorithms have been developed in the past, the proposed algorithms can still help choose suitable algorithms based on existing environmental conditions. The factors considered while developing the algorithms are input noise, channel noise, linear constraint, and coefficients' type of sparseness.

NEW TECHNICAL SOCIETY

A.T.O.M

(Advanced Techtronix Organization of MAIT)

Vision

As engineering students, we are highly interested & excited by these technologies. Robotics & AI intrigue us to become a part of this movement on the brink of innovation by exploring modern technologies like ROS.

Atom Goals

- Build real world robotics projects that we can actually put to use. For instance, Autonomous cleaning robots for our college environment. (We want people to see as many robots roaming in the college as students. That way people know the future is here!). These projects will be the society's major projects that we will build as a whole. These projects will include everything, from CAD to Electronics to simulation to software engineering. We also want to engage in robotics R&D in the fields of biomimicry robots, space robotics etc. at later stages.

- Build many minor projects that will help us get introduced to new technologies and techniques. For example: Design & Build an autonomous transportation robot or an awesome-looking LED sign for our lab in order to learn about CAD, 3D printing, Embedded Systems/IOT etc. These projects help society showcase our skills and learn a ton about new stuff.

- Participate in as many competitions, hackathons and community events from all around the globe as possible. This will help us build our skills and expand our reach.

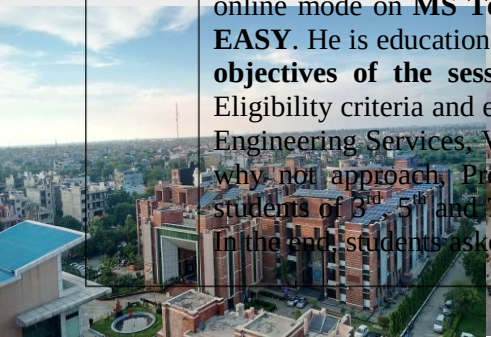
- Build a great portfolio & social media presence. This will help us in acquiring industrial collaboration from companies like KUKA robotics etc. This not only helps us in collecting funds, but also provides a great industrial exposure.

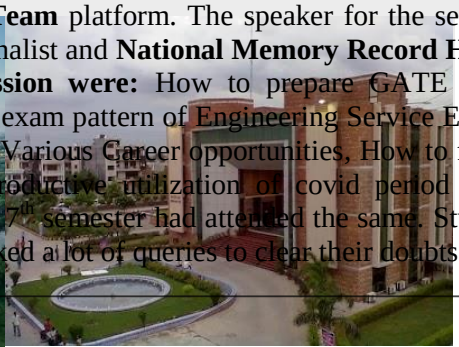
Build a Lab, a Community, a Culture of making and innovating which should inspire students to come to college to stay & make things.

The official newsletter of Department of Electronics and Communication Engineering, MAIT, New Delhi

WORKSHOP/ SEMINAR FOR STUDENTS

S.No.	Workshop and Seminars particulars
1)	**WORKSHOP** **on** **"BUSINESS STANDARD MANAGEMENT AND SKILL DEVELOPMENT"** A work shop on "BUSINESS STANDARD MANAGEMENT AND SKILL DEVELOPMENT" Was organized by Electronics and Communication Engineering department on 17th December, 2021 in the online mode. The main speaker of the workshop was T. Swaminathan (Senior Manager) BSB EDGE Pvt Ltd, Delhi which holds an ISO 9001 certification and is one of the leading providers of national and international standards in India since last 50 years. It helped in familiarizing the students with different aspects of standards and benefits of using these standards on commercial platforms. The latest and most vital information related to the standards and the best practice across the globe were disseminated. Students attending the workshop were familiarized with various standards developing organization (SDO's). Students were informed about the importance of embracing the usages of standards. The facilitation process of implementing the standards was also discussed. Attendees of the workshop where apprised of the various benefits of applying the standard in commercial ventures which could be summed up as following: Reducing Wastage, Improving Customer Satisfaction, Keeping Sensitive Information Secure, Improving Sales And Market Share, Reducing Accidents, Increasing Productivity, Decreasing Energy Consumption, Reassuring Consumer Of Product Quality, Reducing Product Failure, Minimizing Product Rejection.
2)	**WORKSHOP** **on** **Strategy to Crack GATE and Other Competitive Exams** The **Department of Electronics and Communication Engineering** had organized an online session on "**Strategy to Crack Gate & Other Competitive Exams**" on **September 29, 2021** at **4:00 pm-5:30 pm** in online mode on **MS Team** platform. The speaker for the session was Mr. **Jitender Tiwari from Made EASY**. He is educationalist and **National Memory Record Holder of Limca Book of Records**. **The main objectives of the session were:** How to prepare GATE and UPSC, and other competitive exams. Eligibility criteria and exam pattern of Engineering Service Exam (ESE), Different working departments of Engineering Services, Various Career opportunities, How to face different phases of recruitment, Why and why not approach, Productive utilization of covid period for academics and competitive exams. The students of 3rd, 5th and 7th semester had attended the same. Students showed a lot of interest in this session. In the end, students asked a lot of queries to clear their doubts. This was an interactive session.





The official newsletter of Department of Electronics and Communication Engineering, MAIT, New Delhi

Maharaja Agrasen Institute of Technology was established in 1999 by Maharaja Agrasen Technical Education Society promoted by a group of well known Industrialists, Businessman, Professionals and Philanthropists with an aim to promote quality education in the field of Technology and Management. Since then, MAIT has grown from strength to strength to emerge as one of the top technical institutes among the private Institutes and has been constantly ranked amongst the top engineering Institutes by DATAQUEST.

The institute began its first batch of 180 B.Tech. students in 1999 and at present, MAIT offers Bachelor's Degree in 5 disciplines of Engineering - Computer Science and Engineering (240 students intake), Electronics and Communication Engineering, Electrical and Electronics Engineering, Information Technology (180 students intake each), Mechanical and Automation Engineering, Mechanical Engineering, Computer Science & Technology, Information Technology & Engineering, Artificial Intelligence & Machine Learning (AI&ML)** and Artificial Intelligence & Data Science (AI&DS)** (60 students intake each) and Postgraduate degree in Master of Business Administration (180 students intake). The Institute is approved by All India Council for Technical Education and affiliated to Guru Gobind Singh Indraprastha University, Delhi.

MAIT's campus comprises of 10 blocks including Admin Block with Wi-Fi connectivity, well equipped modern laboratories, an intellectually stocked Learning Resource Centre with books and E-Resources, Boys Hostel, Gym and Auditorium.

To build lasting relations with Industries, MAIT invites industries to join hands in fulfilling the social responsibility of imparting industry relevant technical education and training. Its alumni have also distinguished themselves through their achievements in and has been contributing significantly to industry, academics, research, business, government and social domains. The institute continues to work closely with the alumni to enhance its activities through interactions in academic and research programmes.

The overall environment in the institution is highly conducive for growth and provides a quality learning atmosphere for students that promotes culture, sports, societal contributions, art, self-governance and human values.

****Subject to the approval of AICTE/GGSIPU from 2021-22**

Maharaja Agrasen Institute of Technology

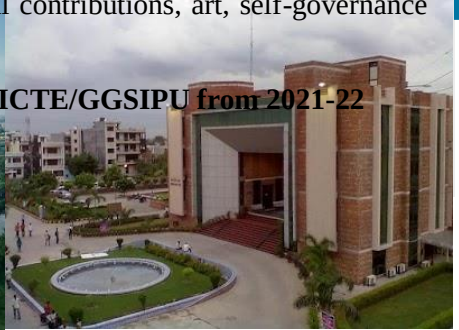
Rohini, Sector 22,

New Delhi 110086

Phone: 011-65647741

Email: mait@mait.ac.in

Website: www.mait.ac.in



MAIT

उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः

The official newsletter of Department of Electronics and Communication Engineering, MAIT, New Delhi

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

MAIT

उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः

The official newsletter of Department of Electronics and Communication Engineering, MAIT, New Delhi