



MAR BASELIOS

COLLEGE OF ENGINEERING AND TECHNOLOGY

AUTONOMOUS

Managed by the Malankara Catholic Educational Society of the Major Archdiocese of Trivandrum
Approved by AICTE | Affiliated to APJ Abdul Kalam Technological University | All B.Tech Programmes provisionally Accredited by NBA (since 2016)
Accredited by NAAC with 'A' Grade (CGPA 3.13) (since 2016)

Mar Baselios College of Engineering and Technology being an Autonomous institution from 2020 onwards, each department has framed its curriculum and syllabi such that students are provided an insight to a challenging academic foundation enriched with courses that are specific to their respective fields of study.

The Department of Civil Engineering has constituted a Department Board of Studies (DAB) that includes several eminent academicians, industry experts, parents and distinguished alumni whose valuable suggestions were gathered before framing the curriculum and syllabi under the Autonomous syllabus followed from 2020 onwards. The curriculum and syllabi prepared under Autonomy 2020 scheme for B.Tech as well as M.Tech Programmes has been put forward in the Board of Studies (BoS) of the Department of Civil Engineering for discussions with eminent Professors and industrial experts. **Dr. J Murali Krishnan**, Professor, IIT Madras; **Dr. N. Ganesan**, Professor (HAG), Department of Civil Engineering and former Dean (Planning & Development), **Dr. S. Chandrakaran**, Professor (HAG), Department of Civil Engineering, and **Dr. T. P. Somasundaram**, Professor, Department of Civil Engineering, all three of them from National Institute of Technology, Calicut; **Dr. P. Jayabalan**, Professor, Department of Civil Engineering, National Institute of Technology, Tiruchirappalli; **Dr. K V Jayakumar**, Professor (HAG), NIT Warangal; **Dr. Tom V. Mathew**, Professor, Department of Civil Engineering, IIT Bombay and **Dr. Anil R.**, Professor, College of Engineering, Trivandrum are the eminent Professors in the BoS. Industrial/Research experts include **Mr. S. N. Raghuchandran Nair**, Managing Director, S. I. Property, Thiruvananthapuram and **Ms. Micky Mathew**, Scientist, National Centre for Earth Science, Thiruvananthapuram. The suggestions received were considered while developing the final curriculum and syllabi for the 2020 scheme. The curriculum and syllabi framed would encourage students to apply their technical knowledge, think creatively, evaluate critically in addition to inculcating a sense of leadership and ethics. The curriculum and syllabi under 2020 scheme for M.Tech Structural Engineering has been revised based on the suggestions from various stakeholders after several discussions and the new curriculum and syllabi for first semester courses has been prepared under the 2022 scheme for M.Tech Structural Engineering. A new P. G. programme has been sanctioned starting from the academic year 2022, M.Tech Programme in Transportation Engineering. The curriculum and syllabus for the first semester of this programme has been developed under the 2022 scheme and approved by the Board of Studies.



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B.Tech COMPUTER SCIENCE AND ENGINEERING

Action taken Report on Curriculum Feedback 2021-2022

Stakeholder	Suggestions
Student	<ul style="list-style-type: none">• Suggested to provide Internship opportunities from college.• Internships helped students in understanding real-world problems and their solutions.• Give opportunities to interact with alumni working on industries and give exposure to them.• Suggestions for including courses discussing the latest technologies.• Suggestions for more workshops and practical applications to in sync with industrial requirements.• Suggestions to provide more subjects that have importance in the industry.• Suggestions to promote hackathons.• Suggestions to foster global exchange program with other institutions.• Suggestions for having a mini project/micro project to get an exposure before the final year project.• May provide awareness about the latest technological advancements and needs.• MOOC Course can be made part of curriculum and also encourage students to take up online courses for going into exploring specialized areas.
Alumni	<ul style="list-style-type: none">• Suggested that programming subjects should more focused on the existing technologies instead of using old not functioning programming languages.• Suggestions to conduct regular Guest Lectures on relevant topics.• Suggested to make summer internships mandatory.• Suggested to introduce the concept of Live Projects to students.• Suggested to collaborate with online edutech companies to provided courses at a subsidized rate for students.• Provide mini project to get an exposure before the final year project and help a student in building his confidence.• Include subjects like Professional Communication, business writing etc

	<ul style="list-style-type: none"> • to make students prepared for interviews and jobs. • Provide internships to get a good exposure for the requirements of the industry. • Pointed out that internships will help to know about corporate culture, processes etc. and will get more clarity on how to start my career.
Faculty	<ul style="list-style-type: none"> • Suggested to provide individual and group activities for improving student skills and to provide employability. • Suggested to provide assignments for making them relate with real time scenarios. • Provide innovative teaching processes such as usage of presentations and nptel videos. • Suggested to visit data centers and NOC's which will help the students to get more exposure in industry. • A detailed discussion was done on each subject's prerequisite and a detailed flow diagram of different subjects was formulated for semesters.
Parents/ Industrial representatives	<ul style="list-style-type: none"> • Need to give more emphasis on courses like Python programming. • Need to incorporate object oriented programming concepts in Python. • Minor subjects in emerging areas of AI may be introduced. • Industrial collaborations of project should be promoted. • Emphasis on project based learning should be given.

Action taken report : 2022 Curriculum

- Various industry talk sessions arranged for students.
- Internships initiated by the department and selected students were send to organizations like Cognitive labs, Keltron, Kerala University etc.
- Workshops for incorporating industrial competency into curriculum design was conducted.
- To enable practical skills on emerging technologies events like project Build_A_Thon , hackathons and Boot camps were arranged.
- Students were encouraged to participate in national talk series, coding competitions and certification courses.
- Certification course on Artificial Intelligence and Machine learning started by the department.
- Mini projects for some subjects were given.
- Skill Development courses on Arduino, Python programming, Web development and Full stack development were started to improve the technical skills..
- Project exhibitions and technical expo were organised for promoting team spirit and encouraging technical skills of students.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Action taken Report on Curriculum Feedback 2021-2022

- Skill Development Programs such as Arduino Programming, Python Programming, SIMULINK programming etc. are added to enhance hardware and technical skills of students and to make them aware of latest technologies.
- During this academic year MoUs were signed with various institutions. Students are encouraged to undergo internships at renowned industries like Sree Chitra Tirunal Institute for Medical Sciences and Technology, National Institute of Speech and Hearing (NISH), Bharat Sanchar Nigam Limited (BSNL), KELTRON, Tata Elxsi Ltd., Vinvish Technologies Pvt. Ltd. etc. to get industrial experience. Students are encouraged to do internships during the semester breaks so that they have better insight on the practical aspects of the concepts learned from the theoretical classes.
- For first semester students, a non-credit course on Professional Communication is included in the Autonomy scheme to make students practice professional communication by providing them various activities.
- In order to make the students capable of working in multidisciplinary areas, we have introduced BTech Minor degree in ECE, EEE, CSE, ME and CE. The students have an option to select any of sub areas from the available baskets.
- To incorporate project-based learning, we have introduced micro-projects and Simulation assignments in a few courses as part of the curriculum.



[Signature]
10/08/22

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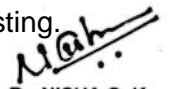
Summary of Curriculum Feedback 2020-21

The following suggestions were put forward by the Stakeholders on the curriculum of the academic year 2020-21.

- Electrical and Computer Engineers are most demanding profession nowadays. Software jobs are easier to get when compared to electrical field in India.
- B.Tech Programme in Electrical and Computer Engineering course definitely helps to get a job in software as well as core Electrical field.
- Need active participation in hackathons, technical fests etc.
- Hands on training, workshops, skill development programs should be conducted in a regular manner.
- Emerging trends like IoT, Data analytics, Machine learning, Artificial Intelligence and Data science etc, should be included or at least workshops regarding the emerging trends should be provided to enhance the understanding of students on these topics.
- Encourage students to come up with start-ups which gives them more opportunities in the field of software and technology.
- The usage of softwares like MATLAB, ANSYS, PSPICE etc, can be included in the course to provide a better insight on the topics in real-time applications.
- Promote students to take-up quality projects and interdisciplinary projects.
- Lab courses on LTSpice simulation software, Eagle CAD, PCB Designing etc, need to be incorporated into the curriculum
- Courses relating to social skill development as well as social awareness need to be included in sight for mental health and struggles faced by many students.
- Awareness sessions/ Practical activities through associations like NSS need to be organized to inculcate aspects of Human rights, Importance of Citizen rights etc.
- The curriculum should include entrepreneurship courses which help the students to start their own entrepreneurial ventures.
- Need value added courses to bridge the gap between industry and academics.
- State of the art lab facilities need to be given.
- Equal importance needs to be given to both theoretical as well as technical knowledge. This will help the students to become more equipped for taking up core jobs.
- The curriculum revision should be as per the needs of the industry and enhance employment opportunities.
- Suggestions are given to include mini projects in the beginning of the second year to improve the difficulties faced at the later stage.
- Courses like industrial management, industrial mentorship for start-ups and projects, laws clauses regarding industrial development, mental and physical health management, how to deal with failure, strategy thinking skills need to be included in the curriculum.

The actions taken based on the suggestions put forward by the Stakeholders are as follows:

- The curriculum is updated on a regular basis, incorporating the recent advancements, feedback from stakeholders. Students are exposed to real time problems and industrial experience through Internships
- New curriculum is developed in such a way that it includes Electives in AI, Machine Learning, IoT etc. Workshops, Add on programmes, Certificate courses on these areas are also conducted so as to develop skills in students and to make them more employable.
- Inclusion of more electives, B. Tech Minors, B. Tech Honors in diverse specializations and emerging trends both in core and other areas included in the Autonomy curriculum.
- Labs are equipped with licensed software like ANSYS, MATLAB etc.
- Modern ICT enabled teaching learning process is enabled.
- Students are encouraged to take up industrial / funded projects.
- Invited talks, webinars on modern engineering software, hardware and recent trends were organized.
- Ensuring active participation of students in various professional bodies like IEEE PES, IET to inculcate leadership qualities among students
- Courses are selected in such a way that it is industry oriented and also it incorporates the recent trends in Electrical and Electronics Engineering. Courses on Electrical Vehicles, IoT, Industrial Automation etc. serve the purpose.
- Students are encouraged to undergo internships at renowned industries, Govt organizations like KSED, KEL etc to get industrial experience.
- Skill Development Programs and Value Added courses to enhance hardware and technical skills are added as compulsory courses driven by the Corporate Relations Department and IEDC.
- Hands-on sessions, Workshops are arranged by the Department association Illumina, Professional societies like IET, IEEE PES to train students in essential softwares like DIALux Lighting Design etc.
- For first semester students, a non-credit course on Communicative English is also included in the Autonomy scheme to make students practice with communication by providing them various activities.
- Subjects like Professional Communication, Constitution of India, Management for Engineers, Universal Human Values are included in the Autonomy scheme from semester 2 onwards highlighting more Humanities and Social Science components in the Engineering Curriculum.
- Fundamental and Advanced Courses by Wadhvani Foundation are provided to students for enhancing and encouraging Entrepreneurs through the Corporate Relations.
- Research groups and cells such as Dynamics and Control, Power Electronics, Electric Vehicles etc, are initiated to encourage research and job opportunities. Alumni interaction is also enhanced through activities of department association and professional bodies.
- As per the revised curriculum, micro projects are included in the laboratories from semester 3 onwards to make students practice on designing and implementation of circuits.
- Students are encouraged to do internships during the semester breaks so that they have better insight on the practical aspects of the equipment or components learned from the theoretical classes.
- As per the new curriculum, the vastness of courses is reduced a bit at the same time more emerging area topics are included in the syllabus that makes courses more interesting.


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DEPARTMENT OF MECHANICAL ENGINEERING Action taken report on Curriculum feedback 2021-2022

Stakeholder	Suggestions
Alumni	<p>The suggestions on the existing UG curriculum by our alumni was to incorporate the following courses:</p> <ul style="list-style-type: none">• Introduction to Aeronautics• Introduction to Spaceflight Dynamics• Wind Power• Spacecraft Technology and Systems Architecture• Future Energy Systems• Introduction to Nuclear Science and Engineering• Combustion Processes• Mechanics of Composite Structures• Mechanics of Thin Films• Innovative Product Design• Feedback Control Systems• FEA for Mechanical and Aerospace Design• Robot Manipulation• Energy Seminars, or seminars based on New and Upcoming Technological Advancements can be introduced and given at least 1 credit of coursework
Students	<p>The suggestions on the existing UG curriculum by our students was to incorporate the following courses:</p> <ul style="list-style-type: none">• Fundamental subject like: Classical Mechanics , Statistical Mechanics , Electromagnetic theory.• Application subjects : Introduction to Programming in MATLAB , Robotics , Additive manufacturing ,Introduction to Biomedical Engineering, Artificial Intelligence/Machine Learning , Training in ANSYS , openfoam , comsol etc• The students suggested to include more simulation and programming, as these have become the need of the hour for modern mechanical engineering skills.• More skills should be provided to students other than what they learn from text books like programming skills,technical skills (practical application).
Experts from Industry and Academia	<p>The suggestions on the existing UG curriculum by the experts from industry and academia was to incorporate the following courses:</p> <ul style="list-style-type: none">• Piping Engineering - Piping forms the core of a continuous process industry, as in the Oil & Gas industry. Mechanical engineers are invariably drawn to design, fabricate and maintain Piping systems. The subject is vast and there are hardly any institutes offering Piping Engineering as a course. Engineers who graduate, take up certificate courses to get accustomed to Piping.• Pressure Vessel Engineering - Pressure vessels form the next core equipment in any Oil and Gas industry. There are no courses available from formal institutes offering such courses. Could be considered as a Core or Elective course.• Corrosion Engineering - Knowledge of corrosion and its effect on Design & engineering, Residual Life Assessment, Corrosion mechanisms.• Green Hydrogen technologies seem to be the science for the future. You may

- add a course on Green Hydrogen Process technologies to ESE curriculum
- Energy Storage Systems - is a future technology. Energy storage allows an efficient flow of power to be maintained despite the intermittent nature of wind or solar sources. This could be included in your syllabus in Semester-1(Non-conventional Energy sources).
- Control systems and python programming should be taught as a mandatory course.
- Include more professional electives like data analytics, IoT, Multi body dynamics, machine learning, robotics etc.
- Recent developments should be included in electives. Some of these can be given as NPTEL MooC courses.
- Design the curriculum and syllabus emphasizing on placement, higher studies and GATE examination.
- Non-destructive testing, Maintenance Engineering, Non Traditional Machining, Rapid prototyping, Micro and Nano Manufacturing and Robotics and Automation were suggested as elective in Production Stream.

Faculty

The suggestions on the existing UG curriculum by our faculty was to incorporate the following courses:

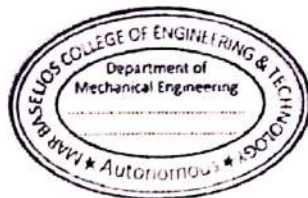
- The suggestions were made from production stream include 3D Printing, Design and Analysis of Experiments and Robotics and Automation.
- Thermal stream suggested the inclusion of Hydrogen Fuel cell Technology to the syllabus
- Machine Design stream suggested Finite Element Analysis, Biomechanics, Introduction to Nonlinear dynamics and Kinematics & Design lab; Adams Software
- Fundamentals of Data Science and Advanced Operation Research lab are the subjects suggested by Industrial Stream.

Action taken report

New elective courses are being offered by MED in 2020 UG curriculum

• Hybrid and Electric Vehicles.	• Industrial Internet of Things.
• Introduction to Business Analytics.	• Data Analytics for Engineers.
• Artificial Intelligence and Machine Learning.	• Robotics and Automation.

It was decided to discuss the left over suggestions from the stake holders in the department curriculum constitutive cell and implement the possible one in the subsequent curriculum revision in the year 2024.



Rijesh
30/7/2022
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