LIVE TO LEARN & LEARN TO SHARE

MRCET CAMPUS

HANDBOOK

(2021 - 2022)

HANDBOOK

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS INSTITUTION - UGC, GOVT. OF INDIA)

Affiliated to JNTUH; Approved by AICTE
NBA(Tier-1) & NAAC with A-GRADE | ISO 9001:2015

UGC AUTONOMOUS

EAMCET/PGECET/ICET CODE: MLRD

www.mrcet.ac.in


YOUR ASPIRATION FOR A
SUCCESSFUL CAREER
STARTS HERE...



MRCET CAMPUS

HANDBOOK

Malla Reddy College of Engineering and Technology-MRCET (UGC Autonomous) was established in 2004, approved by AICTE, Govt of India and affiliated to JNT University, Hyderabad. The college is accredited by National Board of Accreditation (NBA Tier-1) and NAAC - 'A' Grade and also recognized under UGC 2(f) & 12(B) status. The college is an ISO 9001:2015 certified Institution.

The College offers Engineering Courses

B.Tech: ECE, CSE, CSE (AI & ML), CSE (Cyber Security), CSE (Data Science), CSE (IOT), AI & ML, AI & DS: IT, EEE, MECH and ANE.

M.Tech: ECE, CSE, MECH(Machine Design), MECH(Thermal Engineering) and ANE

MBA: Master in Business Administration.

Ph.D: ECE.

The College campus with its arboriculture and horticulture is situated away from the hustle and bustle of the city provides a serene and tranquil atmosphere, which is conducive to both teaching and learning processes.

MRCET has a perspective plan to grow into a 'Center of Excellence' through new initiatives by creating world class infrastructure, expanding international collaborations, developing innovative programs, establishing industrial tie-ups, recruiting well qualified and trained faculty, promoting the talent, nurturing the research and innovation and also fostering the outreach activities with sustainable fund flow.

The campus spread over 50 acres of land with built-up space covering academic, administrative and amenities block with 'State of Art Infrastructural Facility'. It has a cosmopolitan atmosphere to attract large number of student diversity from all corners of the globe. It creates an environment for access to 'Experienced Teaching Faculty' who are well qualified with international exposure to nurture the students creative abilities for new innovations through knowledge partnerships. Our programs include 'New Age Technologies' and 'Innovative Curriculum' to educate our students to deal with the current developing world.

The global standards are set in the field of 'Research and Publications' motivating us for relentless pursuit of academic excellence. The MOUs with various international universities are in vogue to provide for an exchange of students and faculty through academic and research immersion programs 'Encouraging International Collaborations' for the mutual benefit of the college and the aspirants. We expose our students to various National and International Companies for the 'Best In Campus Placements' through internship programs.



CHAIRMAN MESSAGE



Sri. Ch. Malla Reddy

Founder Chairman

Hearty welcome to the students of Malla Reddy Collage of Engineering and Technology!

As knowledge is power, focus must be given in grooming dynamic leaders, not just graduates. Our society needs Enthusiasts with passion to transform India into a “Force to reckon with”. I believe that the aim of Education is the knowledge not of facts but of values. MRCET has always believed in value based education, where modern quality education is imparted in environment which is in conformity with our rich traditions and heritage. I strongly believe in the capabilities of student's community and ensure everything best to reach them for their promising growth.

My best wishes to the students on this momentous occasion.

Sri CH. MALLA REDDY
Founder Chairman



ADVISOR

Visionary Leader for Inspiring Technologies

Dr. VSK Reddy, Advisor

B.Tech, M.Tech, Ph.D (IIT-KGP), FIETE,
MIEEE, MISTE, MCSI, MHE-UK

Greetings from the Malla Reddy College of Engineering & Technology (MRCET)!

It is my pleasure to extend a hearty welcome to all the students of Malla Reddy College of Engineering & Technology (MRCET) and their parents on the eve of Orientation Day Programme. MRCET as an Institution is endowed with ample expertise in the fields of Engineering. Business Management by virtue of its highly qualified and experienced faculty who impart their knowledge and skills while teaching the students.

MRCET has adopted the best academic and professional practices such as introducing certification programmes in various specialized areas, training programmes in upcoming technologies and imparting training in development soft skills which truly constitute holistic, education for the students in preparing them to face challenges posted by the industry.

By virus of imparting quality education to students simultaneously with several training programmes to improve their knowledge in advanced technologies and skill sets in the areas of Engineering, Business Management. Malla Reddy College of Engineering & Technology has acquired the stature of world class technology institute having the capacity to cater to global needs.

On this occasion, I welcome you to join the journey of transformation towards excellence.

PRINCIPAL

Education is the Architecture of the Soul

Dr. S Srinivasa Rao, Principal

B.Tech, M.Tech, Ph.D (JNTUH), MIEEE, MISTE, MIETE



Greetings from Malla Reddy College of Engineering and Technology (UGC Autonomous)!

The evolution of the institute over the past seventeen years has witnessed sturdy combo of infrastructure and expert training with thrust on creativity and innovation. The motivating environment in MRCET for knowledge assimilation, generation and dissemination with a sense of social responsibility, human values and concern for social commitment has carved a niche for itself among the best technical institutes.

The special emphasis is on Outcome Based Education (OBE) and Experiential Learning. There is also an ample scope in co-curricular and extracurricular activities at MRCET for the students to show their talents. MRCET ensures that the students are proved to be the responsible and ideal citizens of our country.

In MRCET, it is believed and practiced that excellence is a continuous process and in pursuit of which the institute has made deep forays in contributing world-renowned technocrats, successful entrepreneurs, competent leaders, innovative scientists and researchers.

On this occasion, I welcome you to MRCET where learning becomes a wonderful experience.

Vision & Mission

Vision

- To establish a pedestal for the integral innovation, team spirit, originality and competence in the students, expose them to face the global challenges and become pioneers of Indian vision of modern society.

Mission

- To become a model institution in the fields of Engineering, Technology and Management.
- To impart holistic education to the students to render them as industry ready engineers.
- To ensure synchronization of institute ideologies with challenging demands of International Pioneering Organizations.

Quality policy

- To implement best practices in Teaching and Learning process for both UG and PG courses meticulously
- To provide state of art infrastructure and expertise to impart quality education.
- To groom the students to become intellectually creative and professionally competitive.
- To channelize the activities and tune them in heights of commitment and sincerity, the requisites to claim the never-ending ladder of SUCCESS year after year.

The MRCET Philosophy

- To pursue continual improvement of teaching learning process of Undergraduate and Post Graduate programs in Engineering & Management vigorously.
- To provide state of the art infrastructure and expertise to impart the quality education.
- To groom the students to become emotionally balanced, intellectually creative and professionally competitive.
- To channelize the activities and tune them in heights of commitment and sincerity, the requisites to climb the never ending ladder of success year after year.



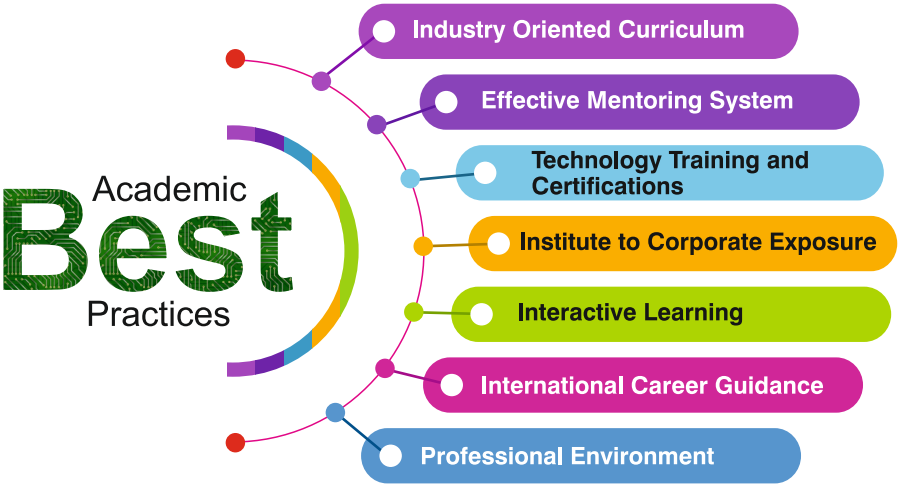
WHY MRCET?



We enhance the employability of students by equipping them with an array of skills like Group Discussions, Personal and Technical interviews, and soft skills to meet the requirements of multinational companies and to make them technologically and professionally competent.

We expose the students to the corporate work culture by organizing workshops, Professional Seminars, Guest Lectures, and Industrial Training by experienced professionals.

- It is a New age College, with global engagement and strategic industry partnerships, offering unconventional courses to influence the lifestyles, business, and governance of students and industry
- MRCET has novel academic programs in tune with the new Education Policy and prepares its students towards new career choices, and provides great access to global information, Open Education Resources (OERs), and Learning Management System (LMS) through Digital Initiatives
- MRCET Persistently seeks and adopts innovative methods to improve the quality of higher education
- MRCET offers industry - focussed specialized undergraduate and postgraduate courses to provide quality higher education on par with international standards



Accomplishments of the Institution

- Autonomous Institution, UGC, Govt. of India.
- Approved by AICTE, Govt. of India, New Delhi
- Permanently Affiliated to JNTUH, Hyderabad
- Accredited by NBA (Tier-1), AICTE, New Delhi.
- Accredited by NAAC-'A' GRADE, UGC, New Delhi, Govt. of India.
- NIRF Ranked institution (251-300 Band) in Engineering category as per NIRF Ranking- 2021, Ministry of Human Resource Development (MHRD), Govt. of India.
- 2(f) & 12(B) Recognition, UGC, Govt. of India
- MSME Incubation Centre
- ISO 9001:2015 Certified Institution.
- 2(f) & 12(B) Recognition, UGC, Govt. of India.
- Band - 'A' Recognition Institutions by ARIIA (ATAL), MHRD Govt of India.
- NSS Unit recognized by JNTUH, Hyderabad.
- Research Centre Status, JNTUH, Hyderabad
- MoU with NRDC, Govt. of India.
- Industry Institute Partnership Cell (IIPC).
- Recognition of Scientific Industrial Research Organizations (SIROs) by Govt. of India.
- MRCET is a life member of NHRD Network.
- CISCO International Certification Authorized Centre.
- Approved to admit Foreign Students/PIO's.
- Nodal Center: IIT - Bombay/Kharagpur for Technology Transfer
- NASSCOM Nodal Center for NAC-Test Assessment
- Business Incubation Centre - MSME, Govt. of India.
- IBM Centre of Excellence.
- Global Education and Career Counseling Centre.





INDUSTRY ORIENTED TRAINING AND CERTIFICATIONS

- IBM Professional Certification Program
- Certification Course on Python
- Certification Course on Artificial Intelligence
- Certification Course on Data Science
- Certification Course on Machine Learning
- JAVA Certification through Oracle Academy
- .Net Certification by Microsoft
- Oracle SQL Certification Course
- Microsoft Innovation Center for Technology Training (MIC) and Certification
- CISCO Networking Course
- Business English Certification (BEC) University of Cambridge, UK





- Oxford Achiever's Certification, Oxford University Press, for Communication Skills
- Big Data Analytics and R-Programming Certification Course
- Organizing Certification Courses such as CISCO, .Net, JAVA, CATIA, Pro-E, MATLAB etc
- Certification Course on Robotics
- Pega Training and Certification
- Certification Course on Auto Cad
- Certification Course on 3D Printing
- Course Certifications
- Soft Skills and Technological Skills Training for Employability

MRCET CAMPUS

BRAND OF EXCELLENCE IN CAMPUS PLACEMENTS

The training and placement cell has evolved and emerged as a destination for many national and multinational organisations to recruit the fresh talent nurtured in the campus. Over the years MRCET has proven its mettle in the industrial arena with continuous extraordinary support from the Principal and the Dean-placements. The college has taken the credit for attracting Multinational IT Service and Product development companies across the globe for recruiting of our students in on-campus placements. In the journey towards excellence, many milestones were also set and accomplished by the department in terms of quality and quantity.

Prof. K. Kailasa Rao
Dean - Placements, MRGI

Major Recruiters @ MRCET

Deloitte. | Capgemini | IBM | TATA CONSULTANCY SERVICES | CGI | DXC.technology | NTT DATA
Infosys | Cognizant | Hexaware TECHNOLOGIES | Atos \| Syntel | apps associates | amazon | Tech Mahindra
TRIANZ | KANTAR | wipro | genpact | Excers | Prolifics | accenture
KEOLIS | HCL TECHNOLOGIES | virtusa | CDK Global | modak analytics | OPENTEXT | SUTHERLAND
CYIENT | DELL

Campus Placements 2021 Pass - Out Batch ▶ **50+ Companies** ▶ **1500+ Job Offers**

R&D TECHNOLOGY INCUBATOR

Research and Development is the mainspring of any nation's economic growth. At MRCET we are committed for long term research activities in advanced engineering domains. The R&D division aspires to transform the lives of young budding engineers, research scholars and faculty through their innovative ideas to contribute for research at academic and industry level through MRCET TECHNOLOGY INCUBATOR. The primary motto of the cell is to become a premier research and technology incubation centre of international repute in the field of Science and Engineering and to contribute to social challenges



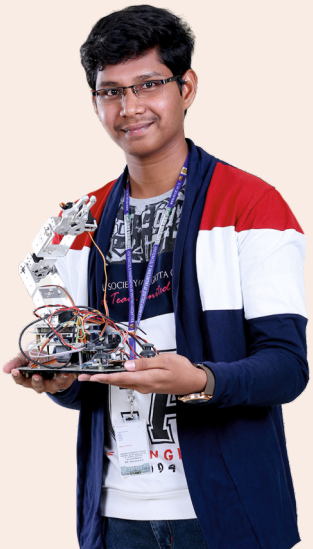
Dr. P.H.V. Sesha Talpa Sai - Director

CENTRES OF EXCELLENCE

- SIRO-DSIR, Govt. of India recognised R & D laboratories and facilities.
- JNTUH Approved Research Centre.
- Centre of Excellence in Robotics.
- Centre for Innovation Incubation & Entrepreneurship (CIIE).
- Innovation and IPR facilitation centre supported by NRDC, Govt. of India.
- Certified Centre of Microsoft Certification & Cisco Certification.
- State-of-art Technologies Centres.
- MoU with NRDC, Department of Scientific and Industrial Research (DSIR), Govt. of India.
- MoU with Business Incubation Centre - MSME, Govt. of India.
- MoU with National Aerospace Laboratories (NAL), Bangalore.
- MoU with Oxford University Press, Oxford University, UK.
- MoU with Zensar Technologies for the Technology Transfer.
- MoU with Mahindra & Mahindra
- MoU with Tech Mahindra
- Nodal Center: IIT - Bombay / Kharagpur for Technology Transfer

START-UP'S

MRCET-Technology Incubator is an instrumental to nurture technology based and knowledge driven startup ventures by tapping the innovative ideas from the students and mentoring them for commercialization of their ideas, by providing an integrated package of working space, office services, access to specialized testing and fabricating equipments, software tools for design and analysis and value added services such as funding linkages, legal and IPR services, business planning, networking support and venture capital services, etc.



EDC / IIPC CENTRE

Industry Institute Partnership Cell (IIPC) is established for enhancing the relationship between the institute and industry. This cell identifies the industrial expectation and promotes institutional preparation for meeting industrial needs by facilitating sponsored R&D projects, seminars, workshops and various other industrial training programmes like Internships, industrial visits, Expert Lectures, Panel discussions, etc.

An Entrepreneurship Development Cell (EDC) in association with Industry Institute Partnership Cell (IIPC) is established in the college to guide and make the students aware about the opportunities in self-employment and also promote entrepreneurship amongst the technical and the management students. It is to focus on the fact that the students should become employers but not simply employees. This needs awareness skill development and opportunity finding along with financial and other feasibility issues.

It assists students to create awareness on various central and state policies such as MSME, PIRE, PCR, ATI, SFURTI, PMEGP, etc.



ECE ELECTRONICS & COMMUNICATION ENGINEERING

The Department of ECE constantly endeavours to improve the academic skills of students in gaining state of the art knowledge in the area of electronics and communications to meet the needs of the industry. The department has created a student's association “Electrosurge” to promote and conduct various student events like Technical symposiums, Tech Fest etc. Student forums like IEEE, IETE and ISTE were formed to give the necessary fillip to co-curricular activities by the students. Apart from the B.Tech programme the department is also offering M.Tech programme. The department has been sanctioned R&D centre by JNTUH, Hyderabad for Ph.D admissions.

The Department has been accredited by NBA (Tier-1) and NAAC - A Grade

Dr. K. Mallikarjuna Lingam, HOD (ECE)
Prof. P. Sanjeeva Reddy, Director (ECE)





Laboratories:

- Digital Signal Processing
- VLSI & Embedded Systems
- Electronic Circuit Analysis
- Image And Video Processing
- Analog &Digital Communications
- Microwave Engineering
- ICA Applications
- Microprocessors and Microcontrollers
- Embedded Systems Laboratory
- Optical Communications
- IOT Technologies Centre

▶ Robotics Centre of Excellence



CSE COMPUTER SCIENCE & ENGINEERING

The Department is committed to establish, maintain and advance a broad understand of Computer Science to fulfill academic and professional objectives. The department has created a student association called “Espirito” under the aegis of which the students have successfully conducted the events like Technical Quizes, Mini Project exhibition, Guest lectures, Tech fest, Technical Symposium to quote a few Students forums such as CSI,IEEE & ISTE were formed mainly to encourage and motivate students to organize various co-curricular activities conducted by the students.

The department is offering the following B.Tech Programmes:

- **Computer Science & Engineering (CSE)**
- **Computer Science & Engineering (AI & ML)**
- **Computer Science & Engineering (CYBER SECURITY)**
- **Computer Science & Engineering (INTERNET OF THINGS)**
- **Computer Science & Engineering (DATA SCIENCE)**
- **Artificial Intelligence & Machine Learning (AI & ML)**
- **Artificial Intelligence & Data Science (AI & DS)**

The Department has been accredited by NBA (Tier-1) and NAAC - A Grade

Dr. S. Shanthi, HOD(CSE)
Dr . MV. Kamal, HOD (Allied Branches of CSE)

Laboratories:

- **Linux Programming**
- **UML Technologies**
- **C, C++ & JAVA**
- **Database Systems**
- **Operating Systems**
- **Networks ProtocolsSimulation**
- **WEB Technologies**
- **Compiler Design**
- **IT Workshop**
- **Machine Learning**

- **Cloud Computing Technology Centre**



IT INFORMATION TECHNOLOGY

The Department of Information Technology established in 2007 approved by AICTE and affiliated to JNT University, Hyderabad. The Department aims to impart high quality education in latest information technologies. The technical students association “Techtrix” was formed which enhances the technical and soft skills to improve the overall performance of the students forum such as CSI,IEEE & ISTE were formed mainly to encourage and motivate students to organize various co-curricular activities conducted by the students.

The Department has been accredited by NBA(Tier-1) and NAAC - A Grade

Dr. G Sharada - HOD (IT, AI&ML)

IT Laboratories:

- Linux Programming
- UML Technologies
- C,C++ & JAVA
- Database Systems
- Operating Systems
- Networks Protocols Simulation
- Web Technologies
- Compiler Design
- IT Workshop
- Machine Learning
- Data ware house and Data Mining Lab
- Mobile Application Development Lab
- Programming for Application Development Lab





- **Big Data Analytics Centre**

EEE ELECTRICAL & ELECTRONICS ENGINEERING

Electrical and Electronics Engineering has gained rapid importance in view of ever increasing demand for power. Apart from thermal, hydro, nuclear power generation, substantial growth in compact units of gas-turbine plants by multinational companies are coming up. The Department has an excellent team of faculty with both Academic, Industrial and R&D experience and constantly strives to be a Centre of Academic Excellence with focus on advanced technology and research by delivering the best quality technical education to the students in making them industry ready along with emphasis on moral and ethical foundation. Student's forums like IEEE, IETE and ISTE were formed to give the necessary impetus to the co-curricular activities by the students.

The Department has been accredited by NAAC - A Grade

Dr. M Sharanya - HOD (EEE)
Prof. K Subhas - Director (EEE)

Laboratories:

- Electrical Machines Laboratory
- Simulation Laboratory
- Power Electronics Laboratory
- Control Systems Laboratory
- Control Engineering Laboratory
- Circuits and Measurement Laboratory
- Electrical Power Systems Laboratory
- Microprocessors & Microcontrollers
- Embedded Systems Laboratory
- Power Converters Laboratory
- **Electrical Systems Simulation Centre**





ME | MECHANICAL ENGINEERING

We're leading the way in areas of Mechanical Engineering to build a cutting-edge technology knowledge base for undertaking Innovation avenues in the era of Industry 4.0 such as Computer Aided Design, Smart manufacturing, Automation and Robotics, Thermal Engineering and Energy sustain ability, Computational Mechanics and Fluid Dynamics, Polymers and Composite Materials.

All the laboratories are equipped with state-of-art facilities for promoting developing innovative and practical solutions to problems in the industry and, in particular, Manufacturing, Automobile and Service sectors. The department promotes research and engineering activities through an agile Industry - Institute Partnership Network with leading industries that focuses on Design, Automobile, Automation and Manufacturing services.

The Department has been accredited by NBA(Tier-1) and NAAC - A Grade

Dr. M Amarnadha Reddy - HOD (MECH)





Laboratories:

- Automation and Control Engineering Lab
- Computer Aided Design Lab
- Computer Aided Testing, Analysis and Modelling lab
- Engineering Workshop Lab
- Fluid Mechanics & Hydraulic Machinery Lab
- Heat Transfer Lab
- Kinematics & Dynamics Lab
- Manufacturing Technology Lab
- Materials Engineering Lab
- Mechanical Measurements and Instrumentation Lab
- Strength of Materials Lab
- Thermal Engineering and Energy Resources Lab
- CEED: Centre of Excellence in Engineering Design

- **MSME Technology Incubator**

AERO AERONAUTICAL ENGINEERING

The Department of Aeronautical Engineering covenants with science of aircraft and aero space. The department is enveloped with eminent and experienced faculty from industries like IAF, DRDO, HAL, ISRO and other reputed organizations. The department is well established with the state of art laboratory facilities which enables practical exposure to students in a multi-dimensional approach. In order to produce real world results, practically one must apply mathematics and sciences to tangible problems. This course trains engineers in designing, manufacturing, analyzing and testing of commercial or military aircraft, missiles, and spacecrafts. The department has been accredited by NBA & NAAC-A-Grade and well verse with professional chapters, center of excellence and collaborations with various reputed organizations as a part of student exchange program. If you're fascinated by the history and methodology behind flying machines- from Leonardo Da Vinci concepts and the Wright Brothers' famous flight of 1903 sophistication and progress of modern jets- then aeronautical engineering would be the degree.

The Department has been accredited by NBA (Tier-1) and NAAC - A Grade

Dr. R Ajith Raj - HOD (AERO)





Laboratories:

- Fluid Mechanics & Strength of materials
- Engineering Workshop
- Aerodynamics & propulsion
- Aircraft Production
- Reverse Engineering Lab
- Aircraft Systems
- Avionics Systems
- Production technology Lab
- Aircraft Vehicle Structures Lab
- **CAD-CAM Centre**

MBA

MASTER OF BUSINESS ADMINISTRATION

The Department of MBA undertook path-breaking initiatives in post graduate education with the introduction of innovative and modern curricula. The department strives for excellence in Teaching, Training, Corporate Networking and Placements. Our approach towards Business Education covers widely divergent expertise with Global approach. We empower the students to realize their potentials and emerge as prospective managers.

This is the 9th Best B - School in India (Other than IIMs) and the only MBA programme having 240 intake inculcating a strong academic and professional environment through a pedagogy includes

- Case Study Approach
- Internships and Live Projects
- HR-Summit
- PEDX Talks
- Organisation Branding
- Concept Thought Process
- Lead Programme
- IIPC and EDC Activities and
- Industrial Visits

The Department has been accredited by NBA (Tier-1) and NAAC - A Grade

Dr. G Naveen Kumar - HOD, MBA



H&S HUMANITIES & SCIENCES

The Department of Humanities & Sciences was established in the year 2004 with the prime focus of providing a conceptual base in basic sciences. Apart from developing acumen in academic excellence, the department is also committed to confer a strong foundation in communication skills that acts as a platform for students to leap into their core engineering courses.

The Department of H&S is Organising Induction Programme “Freshmen Initiative” in the areas of Personality Development, Communication Skills, Time Management, Human Values & Ethics and Professional Etiquettes for the Professional Development of student community to meet the future challenges globally.

The Department has been accredited by NBA (Tier-1) and NAAC - A Grade

Dr. V. Madhusudhana Reddy - HOD (H&S)



Laboratories:

- Language Communication Skills
- Engineering Chemistry
- Computer Programming Lab
- Engineering Physics
- Human Excellence Centre
- French/German Language Lab
- Professional Ethics and Counseling Centre

Professional Skills Development Centre





Faculty - The Heart

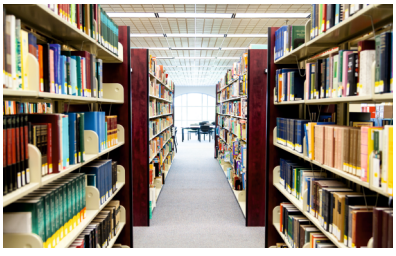
Faculty comprising from learned Academic institutions/Universities and reputed R&D Organizations. The Professors are having the synergy of excellence in application oriented teaching, research and consultancy experienced in India and abroad. The experience academicians continuously Endeavour to impart the knowledge to groom the students as industry ready engineers.



Classrooms

In present context of dynamic teaching learning environments, we cater the requirements of online/ offline teaching pedagogies. The classrooms can be transformed as per the dynamic requirements of real time environments. Effective teaching and learning takes place through advanced technological aids like SMART Boards, Audio – Video systems with Wi-Fi enabled campus. Thus, technology is used at its best to make classrooms more participative and interactive. The class room equipped with full-fledged state-of-art technological digital interface to meet global students

Library



- MRCET has an advanced digital library facility with adequate number of volume and journals to meet the student needs
- High-speed internet facility exclusively for students.
- IEEE and ASME e-journal access
- Video Lectures from IIT's and reputed international Universities for advanced courses to explore latest technologies
- Learning development online resources access facility

HOSTEL FACILITY

A modern eco-friendly exclusive Hostel facility is available for Boys and Girls with internet, Digital Library, Gym and Yoga facility. All the rooms in the Hostel are very spacious and hygienic with good ventilation facility.



SPORTS & GAMES



The College provides excellent sports and games facilities in cricket, football, basket ball, Throw Ball and indoor games. Our students have excelled in sports and games and are champions at university level & national level events too. College has excellent Gymnasium facility for both students and faculty.

Dr. E. Raja Gopal - Physical Director

TRANSPORTATION



The college is providing bus facility for the staff and students connecting all the corners of the city. The College is also providing Exclusive Buses for the girl students on specific routes.

- **Number of Buses: 30**
- **Number of Routes: 24**


ACADEMIC
REGULATIONS



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

Sponsored by CMR Educational Society

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)

Maisammaguda, Dhulapally (Post Via. Kompally), Secunderabad – 500100, Telangana State, India.

Contact Number: 9133555183/9133555162, E-Mail ID: mrcet2004@gmail.com, website: www.mrcet.ac.in

BACHELOR OF TECHNOLOGY

UNDERGRADUATE PROGRAM

ACADEMIC REGULATIONS

(Batches admitted from the academic year 2020 - 2021)

Note: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- ”Autonomous Institution /College” means an institution/college designated as autonomous institute / college by University Grants Commission (UGC), as per the UGC Autonomous College Statutes.
- “Academic Autonomy” means freedom to the College in all aspects of conducting its academic programs, granted by the University for promoting excellence.
- “Commission” means University Grants Commission.
- “AICTE” means All India Council for Technical Education.
- “University” the Jawaharlal Nehru Technological University, Hyderabad.
- “College” means Malla Reddy College of Engineering & Technology, Secunderabad unless indicated otherwise by the context.
- “Program” means:
  - Bachelor of Technology (B.Tech) degree program
  - UG Degree Program: B.Tech
- “Branch” means specialization in a program like B.Tech degree program in Electronics & Communication Engineering, B.Tech degree program in Computer Science and Engineering etc.
- “Course” or “Subject” means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester.
- T–Tutorial, P–Practical, D–Drawing, L-Theory, C-Credits

FOREWORD

The autonomy is conferred on Malla Reddy College of Engineering & Technology (MRCET) by UGC based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the UGC in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Malla Reddy College of Engineering & Technology (MRCET) is proud to win the credence of all the above bodies monitoring the quality of education and has gladly accepted the responsibility of sustaining, and also improving upon the values and beliefs for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several experts drawn from academics, industry and research, in accordance with the vision and mission of the college which reflects the mindset of the institution in order to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications, if needed, are to be sought at appropriate time with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The cooperation of all the stakeholders is sought for the successful implementation of the autonomous system in the larger interests of the institution and brighter prospects of engineering graduates.

"A thought beyond the horizons of success committed for educational excellence"

PRINCIPAL



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)
Sponsored by CMR Educational Society
(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)
Maisammaguda, Dhulapally (Post Via. Kompally), Secunderabad – 500100, Telangana State, India.
Contact Number: 9133555183/9133555162, E-Mail ID: mrcet2004@gmail.com, website: www.mrcet.ac.in

VISION

- To establish a pedestal for the integral innovation, team spirit, originality and competence in the students, expose them to face the global challenges and become technology leaders of Indian vision of modern society.

MISSION

- To become a model institution in the fields of Engineering, Technology and Management.
- To impart holistic education to the students to render them as industry ready engineers.
- To ensure synchronization of MRCET ideologies with challenging demands of International Pioneering Organizations.

QUALITY POLICY

- To implement best practices in Teaching and Learning process for both UG and PG courses meticulously.
- To provide state of art infrastructure and expertise to impart quality education.
- To groom the students to become intellectually creative and professionally competitive.
- To channelize the activities and tune them in heights of commitment and sincerity, the requisites to claim the never - ending ladder of **SUCCESS** year after year.

For more information: www.mrcet.ac.in

ACADEMIC REGULATIONS FOR B. TECH. (REGULAR)

Applicable for the students of B. Tech. (Regular) from the Academic Year 2020-21 and onwards

The college affiliating to JNTUH, Hyderabad offers a 4-year (8 semesters) Bachelor of Technology (B.Tech.) degree programme, under Choice Based Credit System (CBCS) for the following branches of Engineering.

1.0 Award of B. Tech. Degree

A student will be declared eligible for the award of B. Tech. Degree if he/she fulfills the following academic regulations:

1.1 The candidate shall pursue a course of study for not less than four academic years and not more than eight academic years.

1.2 After eight academic years of course of study, the candidate is permitted to write the examinations for two more years.

1.3 The candidate shall register for 160 credits and secure 160 credits with compulsory subjects as listed in Table-1.

Table 1: Compulsory Subjects

S.No	Subject Particulars
1	All practical Subjects
2	Mini Project
3	Project Work

1.4 In addition to 1.3, the candidate has to register for Mandatory courses (Non-credit course), in which 50% of scoring is required for the award of the degree.

2.0 The students, who fail to fulfill all the academic requirements for the award of the degree within ten academic years from the year of their admission, shall forfeit their seats in B. Tech. course.

3.0 Courses of study

The following courses of study are offered at present as specializations for the B. Tech. Course:

S.No	Department
01	Aeronautical Engineering
02	Computer Science Engineering
03	Electronics & Communication Engineering
04	Information Technology
05	Mechanical Engineering
06	Electrical and Electronics Engineering
07	CSE (Artificial Intelligence and Machine Learning)
08	CSE (Data Science)
09	CSE (Cyber Security)
10	CSE (Internet of Things)

4.0 Credits

Particulars	Semester	
	* Periods per week	Credits
Theory	04	04
	03	03
Practical	03	1.5
	04	02
Drawing	03	1.5
	04	02
Mini Project	--	03
Major Project	18	09

***Duration of each period is 60 minutes.**

5.0 Distribution and Weightage of Marks

5.1 The performance of a student in each semester shall be evaluated subject-wise for a maximum of 100 marks for a theory and 100 marks for a practical subject. In addition, Mini Project and Major Project work shall be evaluated for 100 and 300 marks, respectively.

5.2 For theory subjects the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End-Examination.

5.3 For theory subjects, during a semester there shall be 2 mid-term examinations. Each mid- term examination consists of a descriptive paper and assignment. The descriptive paper shall be for 24 marks with a total duration of 2 hours. The descriptive paper shall contain 6 full questions out of which, the student has to answer 4 questions, each carrying 6 marks. Six (6) marks are allocated for Assignments (as specified by the subject teacher concerned). The first Assignment should be submitted before the conduct of the first mid-examination, and the second Assignment should be submitted before the conduct of the second mid-examination. While the first mid-term examination shall be conducted from 1 to 2 units of the syllabus, the second mid-term examination shall be conducted from 3 to 5 units. The total marks secured by the student in each mid-term examination are evaluated for 30 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each candidate.

However, if any student is absent/scoring internal marks less than 40% in any subject of a mid-term examination he/she will be given a chance to write the internal exam once again after he/she re-registering for the internal exam in the concerned subject and paying stipulated fees as per the norms.

The end examination will be conducted for 70 marks with 5 questions consisting of two parts each (a) and (b), out of which the student has to answer either (a) or (b), not both and each question carrying 14 marks.

5.4 For practical subjects, there shall be a continuous evaluation during a semester for 30 sessional marks and 70 end semester examination marks. Out of the 30 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 15 marks conducted by the laboratory teacher concerned. The end semester examination shall be conducted with an external examiner and the laboratory teacher. The external examiner shall be appointed from the clusters of colleges which are decided by the examination branch of the College.

5.5 For the subject having design and/or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and Estimation, the distribution shall be 30 marks for internal evaluation (15 marks for day-to-day work and 15 marks for internal tests) and 70 marks for end semester examination. There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

5.6 There shall be a Mini Project to be taken in III year II Semester examination which carries 3 credits. The Mini Project shall be submitted in a report form and presented before the committee. It shall be evaluated for 100 marks out of which 30 marks for Internal and 70 marks External evaluation. The committee consists of an External Examiner, Head of the Department, and the Supervisor of the Mini Project and a Senior Faculty member of the department.

5.7 Out of a total of 300 marks for the Major Project work which is implemented in two phases i.e., Project I and Project II out of which Project I has to be implemented in IV Year I Semester for which 100 marks shall be allotted. Out of the 100 marks, 30 marks for Internal and 70 marks for External evaluation. Project I shall carry 3 credits and the Internal evaluation shall be on the basis of one seminar given by each student on the topic of his/her project.

5.8 Project II has to be implemented in IV Year II Semester for which 200 marks shall be allotted. Out of the 200 marks, 60 marks are for Internal and 140 marks are for External evaluation. The End Semester Examination of the Major Project work shall be conducted by the same committee as appointed for the Project I. In addition, the project supervisor shall also be included in the committee. The topics for mini project and project work shall be different from one another. The evaluation of project work shall be made at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his/her project.

5.9 The Laboratory marks and the sessional marks awarded by the College are subject to scrutiny and scaling by the college wherever necessary. In such cases, the sessional and laboratory marks awarded by the College will be referred to Academic Council. The Academic Council will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the Academic Council are final and binding. The laboratory records and internal test papers shall be preserved in the College as per the Affiliation University rules and produced before the Committees/Academic Council as and when asked for.

6.0 Attendance Requirements

6.1 A student is eligible to write the University examinations only if he acquires a minimum of 75% of attendance in aggregate of all the subjects.

6.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above, and below 75%) in each semester may be granted by the College Academic Committee

6.3 Shortage of Attendance below 65% in aggregate shall not be condoned.

6.4 A student who is short of attendance in semester may seek re-admission into that semester when offered within 4 weeks from the date of the commencement of class work.

6.5 Students whose shortage of attendance is not condoned in any semester are not eligible to write their end semester examination of that class and their registration stands cancelled.

6.6 A stipulated fee as determined by the examination branch shall be payable towards condonation of shortage of attendance.

6.7 A student will be promoted to the next semester if he/she satisfies the attendance requirement of the present semester, as applicable, including the days of attendance in sports, games, NCC and NSS activities.

6.8 If the candidate is not fulfilling the attendance requirement in the present semester, he/she shall not be permitted for readmission into the same class.

7. Course Registration:

7.1 Every student has to register for a set of Courses in each Semester, with the total number of their Credits being limited by considering the permissible weekly Contact Hours (typically: 30/Week); For this, an average Course Registration of minimum 15 Credits/Semester (e.g., 6-7 Courses) and a maximum of 24 credits are generally acceptable on recommendation of concerned academic advisor by satisfying the pre-requisite conditions.

7.2 Approval of the Course Registration will be informed by the concerned Head of the Department on the beginning of the semester by taking the number of students registered (minimum **one-third** students per class) and availability of the faculty into consideration.

7.3 Dropping of the Course Registration can be permitted up to two weeks from the commencement of the semester. Thereafter no droppings are permitted.

7.4 Interchanging of Course Registrations are not permitted.

7.5 The Pre-requisite conditions for the additional course(s) registration by the students are based on the slots available in the Time Table, Class rooms and Faculty availability.

8.0 Minimum Academic Requirements

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6.

8.1 A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the mid examination (rounded to 10 marks out of 30 marks) and also not less than 35% in end semester examination and minimum 40% of marks in the sum total of the mid-term and end semester exams put together.

8.2 A student will be eligible to be promoted from I year to II year, upon fulfilling the academic requirements of 50 % credits up to I year II semester examinations and secures prescribed minimum attendance in I year.

8.3 A student will be eligible to be promoted from II year to III year, upon fulfilling the academic requirements of 50 % credits up to II year II semester examinations and secures prescribed minimum attendance in II year.

8.4 A student will be eligible to be promoted from III year to IV year, upon fulfilling the academic requirements of 50 % credits up to III year II semester examinations and secures prescribed minimum attendance in III year.

8.5 A student shall register and put up minimum attendance in all 160 credits and shall earn total 160 credits for the award of B.Tech degree. Further, marks obtained in the 160 credits shall be considered for the calculation of percentage of marks as well as overall CGPA.

8.6 Students who fail to earn 160 credits as indicated in the course structure within ten academic years (8 years of study + 2 years additionally for appearing for exams only) from the year of their admission, shall forfeit their seat in B.Tech course and their admission stands cancelled.

9.0 Course pattern

9.1 The entire course of study is for four academic years. I,II,III and IV years shall be on semester pattern.

9.2 A student, eligible to appear for the end examination in a subject, but absent for it or has failed in the end semester examination, may write the exam in that subject during the period of supplementary exams.

9.3 When a student is detained for lack of credits/shortage of attendance, he/she will not be promoted to the next semester for that particular academic year. However, the academic regulations under which he was first admitted shall continue to be applicable to him.

10.0 Grading Procedure

10.1 Marks will be awarded to indicate the performance of student in each theory subject, laboratory/practicals, seminar, UG mini project and UG major project. Based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken grade together) as specified in item 8 above, a corresponding letter shall be given.

10.2 As a measure of the performance of student, a 10-point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks shall be followed.

10.3 Letter Grades and Grade Points:

The UGC recommends a 10-point grading system with the following letter grades as given below:

Letter Grade	Points	% of Marks secured in a subject or course (Class Intervals)
O (Outstanding)	10	Greater than or equal to 90
A+(Excellent)	9	80 and less than 90
A(Very Good)	8	70 and less than 80
B+(Good)	7	60 and less than 70
B(Average)	6	50 and less than 60
C(Pass)	5	40 and less than 50
F(Fail)	0	Below 40
Ab (Absent)	0	-

A student obtaining Grade F shall be considered failed and will be required to reappear in the examination

10.4 Computation of SGPA and CGPA

The UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

Credit points (CP) = grade point (GP) x credits …. For a course

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

$$SGPA\ (Si) = \Sigma(Ci \times Gi) / \Sigma Ci$$

where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

$$CGPA = \Sigma(Ci \times Si) / \Sigma Ci$$

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

10.5. A student obtaining 'F' grade in any subject shall be deemed to have 'failed' and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

10.6 A student who has not appeared for examination in any subject '**Ab'** grade will be allocated in that subject, and student shall be considered **'failed'**. Student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered.

10.7 A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

10.8 A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

Credit points (CP) = grade point (GP) x credits …. For a course

10.9 The student passes the subject/ course only when **GP ≥ 5 ('C' grade or above)**

Illustration of calculation of SGPA

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	4 x 8 = 32
Course 2	4	O	10	4 x 10 = 40
Course 3	4	C	5	4 x 5 = 20
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	C	5	3 x 5 = 15
	21			152

SGPA = 152/21 = 7.24

Illustration of calculation of CGPA:

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
I Year I Semester				
Course 1	4	A	8	4 x 8 = 32
Course 2	4	A+	9	4 x 9 = 36
Course 3	4	B	6	4 x 6 = 24
Course 4	3	O	10	3 x 10 = 30
Course 5	3	B+	7	3 x 7 = 21
Course 6	3	A	8	3 x 8 = 24

I Year II Semester				
Course 7	4	B+	7	4 x 7 = 28
Course 8	4	O	10	4 x 10 = 40
Course 9	4	A	8	4 x 8 = 32
Course 10	3	B	6	3 x 6 = 18
Course 11	3	C	5	3 x 5 = 15
Course 12	3	A+	9	3 x 9 = 27
	Total Credits = 42			Total Credit Points = 327

CGPA = 327/42 = 7.79

10.10 For merit ranking or comparison purposes or any other listing, **only** the **'rounded off'** values of the CGPAs will be used.

10.11 For calculations listed in regulations 10.4 to 10.9, performance in failed subjects/ courses (securing **F** grade) will also be taken into account, and the credits of such subjects/courses will also be included in the multiplications and summations. After passing the failed subject(s) newly secured letter grades will be taken into account for calculation of SGPA and CGPA. However, mandatory courses will not be taken into consideration.

11.0 Passing standards

11.1 student shall be declared successful or 'passed' in a semester, if student secures a GP ≥ 5 ('C' grade or above) in every subject/course in that semester (i.e. when student gets an SGPA ≥ 5.00 at the end of that particular semester); and a student shall be declared successful or 'passed' in the entire under graduate programme, only when he/she gets a CGPA ≥ 5.00 for the award of the degree as required.

11.2 After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, and grade earned etc.), credits earned, SGPA, and CGPA.

12.0 Declaration of results

12.1 Computation of SGPA and CGPA are done using the procedure listed in 10.4 to 10.9.

12.2 For final percentage of formula marks equivalent to the computed final CGPA, the following formula maybe used.

% of Marks = (final CGPA – 0.5) x 10

13.0 Award of Degree

In assessing the performance of the students in examinations, the usual approach is to award marks based on the examinations conducted at various stages (sessional, mid-term, end-semester etc.,) in a semester. As per UGC Autonomous guidelines, the following system is implemented in awarding the grades and CGPA under the **Choice Based Credit System (CBCS).**

13.1 A student shall register and put up minimum attendance in all 160 credits and shall earn a total of 160 credits for the award of B.Tech degree. Further, marks obtained in the 160 credits shall be considered for the calculation of percentage of marks as well as overall CGPA ≥ 5.0, within 8 academic years from the date of commencement of the first academic year, shall be declared to have **'qualified'** for the award of the B.Tech. Degree in the chosen branch of Engineering as selected at the time of admission.

13.2 A student who qualifies for the award of the degree as listed in 13.1 shall be placed in the following classes.

13.3 Students with final CGPA (at the end of the under graduate programme) ≥ 7.50, and shall be placed in **'first class with distinction'**.

13.4 Students with final CGPA (at the end of the under graduate programme) ≥ 6.50 but < 7.50, shall be placed in **'first class'**.

13.5 Students with final CGPA (at the end of the under graduate programme) ≥ 5.50 but < 6.50, shall be placed in **'Second class'.**

13.6 All the other students who qualify for the award of the degree (as per item 13.1), with final CGPA (at the end of the under graduate programme) ≥ 5.00 but < 5.50, shall be placed in **'pass class'** provided they secure a total of 160 credits.

13.7 A student with final CGPA (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.

13.8 Students fulfilling the conditions listed under item 13.3 alone will be eligible for award of **'university rank'** and **'gold medal'.**

14.0 Withholding of results

14.1 If the student has not paid the fees to the university/ college at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

15.0 Transitory regulations.

15.1 A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subjects/ courses (or equivalent subjects/ courses, as the case may be), and same professional electives/ open electives (or from set/category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).

15.2 After the revision of the regulations, the students of the previous batches will be given two chances for passing in their failed subjects, one supplementary and the other regular. If the students cannot clear the subjects in the given two chances, they shall be given equivalent subjects as per the revised regulations which they have to pass in order to obtain the required number of credits.

15.3 In case of transferred students from other Universities, the credits shall be transferred to JNTUH as per the academic regulations and course structure of the MRCET.

16 Minimum Instruction Days

The minimum instruction days for each semester shall be 90days.

17.0 General

17.1 Wherever the words he, him, his, occur in the regulations, they include she, her, hers.

17.2 The academic regulation should be read as a whole for the purpose of any interpretation.

17.3 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.

17.4 The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.

17.5 The students seeking transfer to colleges affiliated to JNTUH from various other Universities/Institutions, have to pass the failed subjects which are equivalent to the subjects of prescribed curriculum of the institute, and also pass the subjects of prescribed curriculum of the institute which the candidates have not studied at the earlier Institution on their own without the right to sessional marks. Further, though the students have passed some of the subjects at the earlier institutions, if the same subjects are prescribed in different semesters of prescribed curriculum of the institute, the candidates have to study those subjects in prescribed curriculum of the institute in spite of the fact that those subjects are repeated.

18.0 Scope

18.1 The academic regulations should be read as a whole, for the purpose of any interpretation.

18.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic senate is final.

18.3 The college may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the date notified by the academic senate of the college.

Academic Regulations for B.Tech. (Lateral Entry Scheme) w.e.f the AY 2020-21

1. **Eligibility for award of B. Tech. Degree (LES)**
The LES students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years.

2. The student shall register for 120 credits and secure total 120 credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree.

3. The students, who fail to fulfill the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.

4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

5. Promotion rule

5.1 A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the mid examination (rounded to 10 marks out of 30 marks) and also not less than 35% in end semester examination and minimum 40% of marks in the sum total of the mid-term and end semester exams put together.

5.2 A student will be eligible to be promoted from II year to III year, upon fulfilling the academic requirements of 60 % credits up to II year II semester examinations and secures prescribed minimum attendance in II year.

5.4 A student will be eligible to be promoted from III year to IV year, upon fulfilling the academic requirements of 60 % credits up to III year II semester examinations and secures prescribed minimum attendance in III year.

6. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)

MALPRACTICES RULES

DISCIPLINARY ACTION FOR IMPROPER CONDUCT IN EXAMINATIONS

S.No	Nature of Malpractices/Improper conduct *If the candidate:*	Punishment
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already

		appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Using objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that

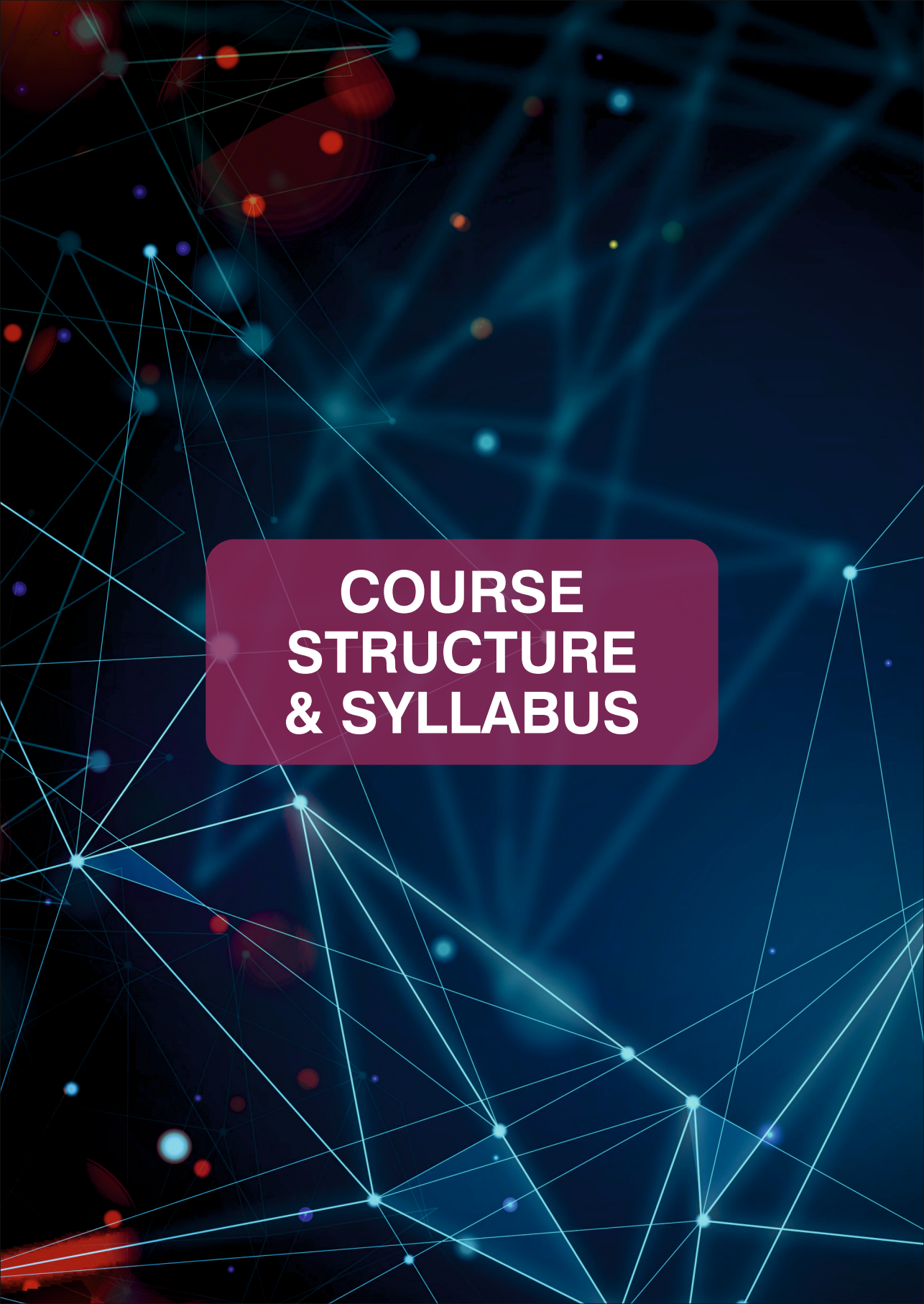
	by visible representation, assaults the officer-incharge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including

		practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.
2. Punishment for institutions: (if the squad reports that the college is also involved in encouraging malpractices)
   i. A show cause notice shall be issued to the college.
   ii. Impose a suitable fine on the college.
   iii. Shifting the examination centre from the college to another college for a specific period of not less than one year.

* * * * *


COURSE
STRUCTURE
& SYLLABUS

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(CSE/AI&ML/Data Science/Cyber Security/IoT/B Tech-AI&ML/B Tech- AI&DS)

COURSE STRUCTURE

I Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0001	English	2	0	0	2	30	70
2	R20A0021	Mathematics – I	3	1	0	4	30	70
3	R20A0201	Basic Electrical Engineering	3	0	0	3	30	70
4	R20A0302	Computer Aided Engineering Graphics	2	0	2	3	30	70
5	R20A0501	Programming for Problem Solving	3	0	0	3	30	70
6	R20A0081	English Language Communication Skills Lab	-	0	2	1	30	70
7	R20A0281	Basic Electrical Engineering Lab	-	0	3	1.5	30	70
8	R20A0581	Programming for Problem Solving Lab	-	0	3	1.5	30	70
9	R20A0003	Human Values and Professional Ethics	1	0	0	1	100	-
		Total	**14**	**1**	**10**	**20**	**340**	**560**

I Year B. Tech – II Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0002	Professional English	2	0	0	2	30	70
2	R20A0022	Mathematics – II	3	1	0	4	30	70
3	R20A0011	Applied Physics	3	0	0	3	30	70
4	R20A0401	Analog and Digital Electronics	3	0	0	3	30	70
5	R20A0502	Python Programming	3	0	0	3	30	70
6	R20A0082	Applied Physics Lab	-	0	3	1.5	30	70
7	R20A0582	Python Programming Lab	-	0	3	1.5	30	70
8	R20A0084	Engineering and IT Workshop	-	0	2	1	30	70
9	R20A0064	Financial Institutions, Markets and Services	1	0	0	1	100	-
		Total	**15**	**1**	**8**	**20**	**340**	**560**

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ECE/EEE

COURSE STRUCTURE

I Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0001	English	2	0	0	2	30	70
2	R20A0021	Mathematics – I	3	1	0	4	30	70
3	R20A0011	Applied Physics	3	0	0	3	30	70
4	R20A0401	Analog and Digital Electronics	3	0	0	3	30	70
5	R20A0501	Programming for Problem Solving	3	0	0	3	30	70
6	R20A0082	Applied Physics Lab	-	0	3	1.5	30	70
7	R20A0084	Engineering and IT Workshop	-	0	2	1	30	70
8	R20A0581	Programming for Problem Solving Lab	-	0	3	1.5	30	70
9	R20A0064	Financial Institutions, Markets and Services	1	0	0	1	100	-
		Total	**15**	**1**	**08**	**20**	**340**	**560**

I Year B. Tech – II Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0002	Professional English	2	0	0	2	30	70
2	R20A0022	Mathematics – II	3	1	0	4	30	70
3	R20A0201	Basic Electrical Engineering	3	0	0	3	30	70
4	R20A0302	Computer Aided Engineering Graphics	2	0	2	3	30	70
5	R20A0502	Python Programming	3	0	0	3	30	70
6	R20A0081	English Language Communication Skills Lab	-	0	2	1	30	70
7	R20A0281	Basic Electrical Engineering Lab	-	0	3	1.5	30	70
8	R20A0582	Python Programming Lab	-	0	3	1.5	30	70
9	R20A0003	Human Values and Professional Ethics	1	0	0	1	100	-
		Total	**14**	**1**	**10**	**20**	**340**	**560**

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE STRUCTURE

I Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0001	English	2	0	0	2	30	70
2	R20A0021	Mathematics – I	3	1	0	4	30	70
3	R20A0201	Basic Electrical Engineering	3	0	0	3	30	70
4	R20A0302	Computer Aided Engineering Graphics	2	0	2	3	30	70
5	R20A0501	Programming for Problem Solving	3	0	0	3	30	70
6	R20A0081	English Language Communication Skills Lab	-	0	2	1	30	70
7	R20A0281	Basic Electrical Engineering Lab	-	0	3	1.5	30	70
8	R20A0581	Programming for Problem Solving Lab	-	0	3	1.5	30	70
9	R20A0003	Human Values and Professional Ethics	1	0	0	1	100	-
		Total	**14**	**1**	**10**	**20**	**340**	**560**

I Year B. Tech – II Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0002	Professional English	2	0	0	2	30	70
2	R20A0022	Mathematics – II	3	1	0	4	30	70
3	R20A0011	Applied Physics	3	0	0	3	30	70
4	R20A0401	Analog and Digital Electronics	3	0	0	3	30	70
5	R20A0502	Python Programming	3	0	0	3	30	70
6	R20A0082	Applied Physics Lab	-	0	3	1.5	30	70
7	R20A0582	Python Programming Lab	-	0	3	1.5	30	70
8	R20A0084	Engineering and IT Workshop	-	0	2	1	30	70
9	R20A0064	Financial Institutions, Markets and Services	1	0	0	1	100	-
		Total	**15**	**1**	**8**	**20**	**340**	**560**

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECH/ANE

COURSE STRUCTURE

I Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0001	English	2	0	0	2	30	70
2	R20A0021	Mathematics – I	3	1	0	4	30	70
3	R20A0012	Engineering Physics	3	0	0	3	30	70
4	R20A0013	Engineering Chemistry	3	0	0	3	30	70
5	R20A0501	Programming for Problem Solving	3	0	0	3	30	70
6	R20A0084	Engineering and IT Workshop	-	0	2	1	30	70
7	R20A0083	Engineering Physics/Engineering Chemistry Lab	-	0	3	1.5	30	70
8	R20A0581	Programming for Problem Solving Lab	-	0	3	1.5	30	70
9	R20A0064	Financial Institutions, Markets and Services	1	0	0	1	100	-
		Total	**15**	**1**	**8**	**20**	**340**	**560**

I Year B. Tech – II Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R20A0002	Professional English	2	0	0	2	30	70
2	R20A0022	Mathematics – II	3	1	0	4	30	70
3	R20A0261	Basic Electrical and Electronics Engineering	3	0	0	3	30	70
4	R20A0301	Engineering Graphics	2	0	2	3	30	70
5	R18A0502	Python Programming	3	0	0	3	30	70
6	R20A0081	English Language Communication Skills Lab	-	0	2	1	30	70
7	R20A0289	Basic Electrical and Electronics Engineering Lab	-	0	3	1.5	30	70
8	R20A0582	Python Programming Lab	-	0	3	1.5	30	70
9	R20A0003	Human Values and Professional Ethics	1	0	0	1	100	-
		Total	**14**	**1**	**10**	**20**	**340**	**560**

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

2 /- /- /2

(R20A0001) ENGLISH

INTRODUCTION

English is a global language which is a means to correspond globally. Keeping in account of its vital role in the global market, emphasis is given to train the students to acquire language and communication skills. The syllabus is designed to develop and attain the competency in communicative skills.

The lectures focus on the communication skills and the selected excerpts support as resources for the teachers to develop the relevant skills in the students. The lessons stimulate discussions and help in comprehending the content effectively. The focus is on skill development, nurturing ideas and practicing the skills.

COURSE OBJECTIVES:

1. To enable students to enhance their lexical, grammatical and communicative competence.
2. To equip the students to study the academic subjects with better perspective through theoretical and practical components of the designed syllabus.
3. To familiarize students with the principles of writing and to ensure error-free writing
4. To sharpen the speaking skills of learners by involving them in diverse activities such as group discussions, debates, conversations and role plays.
5. To train students in soft skills with the help of case studies.

SYLLABUS

Reading Skills:

Objectives

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To augment the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.,
    - Skimming the text
    - Understanding the gist of an argument
    - Identifying the topic sentence
    - Inferring lexical and contextual meaning
    - Understanding discourse features
    - Recognizing coherence/sequencing of sentences
    - Scanning the text

NOTE:
The students will be trained in reading skills using the prescribed text for detailed study. They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:
Objectives

1. To develop an awareness in the students about basic formal writing skills.
2. To equip students with the components of different forms of writing, beginning with the required ones:
    - Writing sentences
    - Use of appropriate vocabulary
    - Coherence and cohesiveness
    - Formal and informal letter writing

Unit –I
"The Road not taken" by Robert Frost
Grammar – Tenses and Punctuation (Sequences of Tenses)
Vocabulary – Word Formation - Prefixes and Suffixes
Writing –Paragraph Writing (Focusing on Tenses and Punctuations)
Reading –The art of skimming and scanning -Reading Exercise Type 1
(Match the statements to the text they refer to)

Unit – II
"Abraham Lincoln's Letter to His Son's Teacher"
Grammar – Direct and Indirect Speech
Vocabulary – Synonyms, Antonyms
Writing – Essay Writing (Introduction, body and conclusion)
Reading – Comprehending the context– Reading Exercise Type 2
(Place the missing statement)

Unit – III
Satya Nadella's Email to His Employees on his First Day as CEO of Microsoft
Grammar – Voices
Vocabulary – One-Word Substitutes, Standard Abbreviations
Writing – E-mail Writing, Letter Writing (complaints, requisitions, apologies).
Reading – Reading Comprehension- Reading Exercise Type 3
(Reading between the lines)

Unit – IV
J K Rowling's Convocation Speech at Harvard
Grammar – Articles, Misplaced Modifiers
Vocabulary – Phrasal Verbs
Writing – Précis Writing
Reading – Reading Exercise Type 4
(Cloze test)

Unit –V
Abdul Kalam's Biography

Grammar	–	Subject-Verb Agreement, Noun-Pronoun Agreement
Vocabulary	–	Commonly Confused Words
Writing	–	Memo Writing
Reading	–	Reading Exercise Type 5 (Identifying errors)

* Exercises apart from the textbook shall also be used for classroom tasks.

REFERENCE BOOKS:

1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007
3. On Writing Well. William Zinsser. Harper Resource Book. 2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
5. Communication Skills. Sanjay Kumar and Pushpa Lata. Oxford University Press. 2011.

COURSE OUTCOMES:

After completion of the course students will be able to:

1. Gain competence and proficiency in 'productive' skills, i.e., writing and speaking with the recognition of the need for life-long learning of the same
2. Hone their language abilities in terms of comprehending complex technical texts with a potential to review literature
3. Present ideas clearly and logically to analyze data and provide valid conclusions in written communication
4. Enrich their grammatical accuracy and fluency to be adept at both the active and passive skills
5. Represent old conventions with a set of the new by professional verbal communicative ability.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/1/-/4

(R20A0021) MATHEMATICS –I

COURSE OBJECTIVES:

To learn

1. The concept of a Rank of the matrix and applying the concept to know the consistency and solving the system of linear equations.
2. The concept of Eigen values, Eigen vectors and Diagonalization.
3. The maxima and minima of functions of several variables.
4. The Applications of first order ordinary differential equations and methods to solve higher order differential equations.
5. The properties of Laplace Transform, Inverse Laplace Transform and Convolution theorem.

UNIT I: Matrices

Introduction, Rank of a matrix - Echelon form, Normal form, Consistency of system of linear equations (Homogeneous and Non-Homogeneous)-Gauss-Siedel method, Linear dependence and independence of vectors, Eigen values and Eigen vectors and their properties (without proof), Cayley-Hamilton theorem (without proof), Diagonalization of a matrix.

UNIT II: Multi Variable Calculus (Differentiation)

Functions of two variables, Limit, Continuity, Partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobian-functional dependence and independence, Maxima and minima and saddle points, Method of Lagrange multipliers, Taylors theorem for two variables.

UNIT III:First Order Ordinary Differential Equations

Exact, Equations reducible to exact form, Applications of first order differential equations - Newton's law of cooling, Law of natural growth and decay, Equations not of first degree-Equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

UNIT IV: Differential Equations of Higher Order

Linear differential equations of second and higher order with constant coefficients: Non-homogeneous term of the type f(x) = e^{ax}, sinax, cosax, x^n, e^{ax} V and x^n V - Method of variation of parameters, Equations reducible to linear ODE with constant coefficients-Cauchy's Euler equation and Legendre's equation.

UNIT V: Laplace Transforms

Definition of Laplace transform, domain of the function and Kernel for the Laplace transforms, Existence of Laplace transform, Laplace transform of standard functions, first shifting Theorem, Laplace transform of functions when they are multiplied and divided by "t", Laplace transforms of derivatives and integrals of functions, Unit step function, Periodic function.

Inverse Laplace transform by Partial fractions, Inverse Laplace transform of functions when they are multiplied and divided by" s", Inverse Laplace Transforms of derivatives and integrals of functions, Convolution theorem, Solving ordinary differential equations by Laplace transform.

TEXT BOOKS

1. Higher Engineering Mathematics by B V Ramana., Tata McGraw Hill.
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Advanced Engineering Mathematics by Kreyszig, JohnWiley &Sons.

REFERENCE BOOKS

1. Advanced Engineering Mathematics by R.K Jain & S R K Iyenger, Narosa Publishers.
2. Ordinary and Partial Differential Equations by M.D. Raisinghania, S.Chand Publishers
3. Engineering Mathematics by N.P Bali and Manish Goyal.

COURSE OUTCOMES:

After learning, the concepts of this paper the student will be able to

1. Analyze the solutions of the system of linear equations and find the Eigen values and Eigen vectors of a matrix, which are used to analyze the long-term behavior of any system.
2. Find the extreme values of functions of two variables with / without constraints.
3. Solve first order, first degree differential equations and their applications.
4. Form a differential equation for typical engineering problems and hence can solve those higher order differential equations.
5. Solve differential equations with initial conditions using Laplace Transformation.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0201) BASIC ELECTRICAL ENGINEERING

COURSE OBJECTIVES:

1. To understand the basic concepts of electrical circuits & networks and their analysis which is the foundation for all the subjects in the electrical engineering discipline.
2. To emphasize on the basic elements in electrical circuits and analyze Circuits using Network Theorems.
3. To analyze Single-Phase AC Circuits.
4. To illustrate Single-Phase Transformers and DC Machines.
5. To get overview of basic electrical installations and calculations for energy consumption.

UNIT –I:

Introduction to Electrical Circuits: Concept of Circuit and Network, Types of elements, R-L-C Parameters, Independent and Dependent sources, Source transformation and Kirchhoff's Laws

UNIT –II:

Network Analysis: Network Reduction Techniques- Series and parallel connections of resistive networks, Star–to-Delta and Delta-to-Star Transformations for Resistive Networks, Mesh Analysis, and Nodal Analysis,

Network Theorems**:** Thevenin's theorem, Norton's theorem and Superposition theorem, Illustrative Problems.

UNIT-III:

Single Phase A.C. Circuits: Average value, R.M.S. value, form factor and peak factor for sinusoidal wave form. Steady State Analysis of series R-L-C circuits. Concept of Reactance, Impedance, Susceptance, Admittance, Concept of Power Factor, Real, Reactive and Complex power and Illustrative Problems.

UNIT –IV:

Electrical Machines (elementary treatment only): Single phase transformers: principle of operation, constructional features and EMF equation. DC.Generator: principle of operation, constructional features, EMF equation. DC Motor: principle of operation, Back EMF, torque equation.

UNIT –V:

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, Types of Wires and Cables, Earthing. Elementary calculations for energy consumption

TEXT BOOKS:

1. Engineering Circuit Analysis - William Hayt, Jack E. Kemmerly, S M Durbin, Mc Graw Hill Companies.
2. Electric Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
3. Electrical Machines – P.S.Bimbra, Khanna Publishers.

REFERENCE BOOKS:

1. Network analysis by M.E Van Valkenburg, PHI learning publications.
2. Network analysis - N.C Jagan and C. Lakhminarayana, BS publications.
3. Electrical Circuits by A. Sudhakar, Shyammohan and S Palli, Mc Graw Hill Companies.
4. Electrical Machines by I.J. Nagrath & D. P. Kothari, Tata Mc Graw-Hill Publishers.

COURSE OUTCOMES:

At the end of the course students, would be able to

1. Apply the basic RLC circuit elements and its concepts to networks and circuits.
2. Analyze the circuits by applying network theorems to solve them to find various electrical parameters.
3. Illustrate the single-phase AC circuits along with the concept of impedance parameters and power.
4. Understand the Constructional Details and Principle of Operation of DC Machines and Transformers
5. Understand the basic LT Switch gear and calculations for energy consumption.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

2/-/2/3

(R20A0302) COMPUTER AIDED ENGINEERING GRAPHICS

COURSE OBJECTIVES:

1. To learn basic engineering graphic communication skills & concept.
2. To learn the 2D principles of orthographic projections And Multiple views of the same
3. To know the solid Projection and Its Sectional Views
4. To gain the capability of designing 3D objects with isometric principles by using computer aided sketches
5. To know the conversion of Orthographic Views to isometric Views And isometric to Orthographic views

UNIT-I

Introduction to Computer Aided Engineering Graphics

Introduction, Drawing Instruments and their uses, BIS conventions, lettering Dimensioning & free hand practicing. AutoCAD User Interface – Menu system – coordinate systems, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, – tool bars (draw, modify, annotations, layers etc.) – status bar (ortho, grid, snap, iso etc.),

Generation of points, lines, curves, polygons, dimensioning, layers, blocks.,.

Geometrical constructions

Curves Used in Engineering Practice

a) Conic Sections (General Method only- Eccentricity Method)
b) Cycloid, Epicycloid and Hypocycloid

UNIT-II:

2D PROJECTIONS

Orthographic Projections: – Conventions – First and Third Angle projections.

Projections of Points, Projections of Lines, Projections of planes

UNIT– III

Projections of Solids: Projections of regular solids prism and pyramid inclined to both planes.

Sections of solids: Section planes and sectional view of right regular solids- prism, cylinder, pyramid and cone, True shapes of the sections.

UNIT– IV

3D Projections

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views, Commands for 3D UCS, Extrude, revolve, loft, 3D move, 3D rotate, dox, sphere, cone, wedge, cylinder, view ports.

Plane Figures, Simple and Compound Solids.

UNIT– V

Transformation of Projections: Visualize the 2D &3D View of Engineering Objects for Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects in AutoCAD

TEXT BOOKS:

1. Engineering Drawing – N.D. Bhatt & V.M. Panchal, 48th edition, 2005 Charotar Publishing House, Gujarat.
2. "Computer Aided Engineering Drawing"by Dr. M H Annaiah, Dr C N Chandrappa and Dr B Sudheer Premkumar, Fifth edition, New Age International Publishers

REFERENCE BOOKS:

1. Computer Aided Engineering Drawing – S. Trymbaka Murthy, - I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-2006.
2. Engineering Graphics - K.R. Gopalkrishna, 32nd edition, 2005- Subash Publishers Bangalore.

COURSE OUTCOMES:

After the completion of course the student will be capable to

1. Produce geometric construction, dimensioning & Curves and detail drawings.
2. Compile Projections of points, lines, planes then create virtual drawing by using computer
3. Sketch the Solid Projections & Sectioning of the solids
4. Develop isometric drawings of simple objects reading the orthographic projections of those objects.
5. Understand and visualize the 3-D view of engineering objects. Elaborate the conversions of 2D -3D and Vice-Versa

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0501) PROGRAMMING FOR PROBLEM SOLVING

COURSE OBJECTIVES:

Students will be able to

1. Understand the use of computer system in problem solving and to build program logic with algorithms and flowcharts.
2. Explain the features and constructs of C programming such as data types, expressions Loops, arrays, strings and pointers
3. Learn how to write modular Programs using Functions
4. Understand the use of Structures, Unions and Files
5. Use basic data structures like stacks, queues and linked lists in designing applications

UNIT - I

Introduction to Computing – Computer Systems, Computing Environments, Computer Languages, Algorithms and Flowcharts, Steps for Creating and Running programs.
Introduction to C – History of C, Features of C, Structure of C Program, Character Set,
C Tokens - keywords, Identifiers, Constants, Data types, Variables. Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversion, typedef, enum
Control Structures: Selection Statements(Decision Making) – if and switch statements, Repetition Statements (Loops) - while, for, do-while statements, Unconditional Statements – break, continue, goto.
Command line arguments

UNIT-II

Pointers – Pointer variable, pointer declaration, Initialization of pointer, accessing variables through pointers, pointer arithmetic, pointers to pointers, void pointers
Arrays – Definition, declaration of array, Initialization, storing values in array, two dimensional arrays, Multi-dimensional arrays. Arrays and Pointers, Array of pointers
Strings – Declaration and Initialization, String Input / Output functions, Array of strings, String manipulation functions, Unformatted I/O functions, strings and pointers

UNIT-III

Designing Structured Programs using Functions - Types of Functions- user defined functions, Standard Functions, Categories of functions, Parameter Passing techniques, Scope – Local Vs Global, Storage classes, Recursive functions.
Passing arrays as parameters to functions, Pointers to functions, Dynamic Memory allocation.

UNIT-IV

Structures and Unions - Declaration, initialization, accessing structures, operations on structures, structures containing arrays, structures containing pointers, nested structures, self referential structures, arrays of structures, structures and functions, structures and pointers, unions..

Files – Concept of a file, Streams, Text files and Binary files, Opening and Closing files, File input / output functions. Sequential Access and Random Access Functions.

UNIT-V

Basic Data Structures – Linear and Non Linear Structures – Implementation of Stacks, Queues, Linked Lists and their applications.

Case Studies

Case 1: Student Record Management System

The main features of this project include basic file handling operations; you will learn how to add, list, modify and delete data to/from file.

Currently, listed below are the only features that make up this project, but you can add new features as you like to make this project a better one!

- Add record
- List record
- Modify record
- Delete record

Case 2: Library Management System

This project has 2 modules.

1. Section for a librarian
2. Section for a student

A librarian can add, search, edit and delete books. This section is password protected. That means you need administrative credentials to log in as a librarian.

A student can search for the book and check the status of the book if it is available.

Here is list of features that you can add to the project.

1. You can create a structure for a student that uniquely identify each student. When a student borrows a book from the library, you link his ID to Book ID so that librarian can find how burrowed particular book.
2. You can create a feature to bulk import the books from CSV file.
3. You can add REGEX to search so that a book can be searched using ID, title, author or any of the field.
4. You can add the student login section.

TEXT BOOKS:

1. Mastering C, K.R.Venugopal, S R Prasad, Tata McGraw-Hill Education.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning
3. Data Structures and Algorithms Made Easy by Narasimha Karumanchi, Career Monk publications, 2017

REFERENCE BOOKS:

1. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI.
2. Computer Programming, E.Balagurusamy, First Edition, TMH.
3. C and Data structures – P. Padmanabham, Third Edition, B.S. Publications.
4. Programming in C, Ashok Kamthane. Pearson Education India.
5. Data Structures using C by Aaron M. Tenenbaum, Pearson Publications
6. Data Structures using C by Puntambekar

Course Outcomes:

At the end of the course the student will be able to

1. Understand a problem and build an algorithm/flowchart to solve it
2. Construct C programs using various control statements, arrays and pointers
3. Understand the concept of subprograms and recursion
4. Develop programs using structures and unions for storing dissimilar data items
5. Make use of files and file operations to store and retrieve data

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/2/1

(R20A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The Language Lab focuses on the production and practice of sounds of the English language and familiarizes the students with its use in everyday situations and contexts.

COURSE OBJECTIVES:

1. To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
2. To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
3. To bring about a consistent accent and intelligibility in their pronunciation, ample speaking opportunities are provided.
4. To improve the fluency in spoken English and neutralize mother tongue influence.
5. To train students to use language appropriately for interviews, group discussions and public speaking.

English Language Communication Skills Lab has two parts

A. Computer Assisted Language Learning (CALL) Lab
B. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab

UNIT –I

CALL Lab: Introduction to Phonetics –Speech Sounds –Vowels and Consonants-Transcriptions

ICS Lab: Ice-Breaking activity - JAM session

UNIT –II

CALL Lab: Pronunciation: Past Tense Markers and Plural Markers

ICS Lab: Situational Dialogues/Role Plays-–Greetings - Taking Leave – Introducing Oneself and Others - Requests and Seeking Permissions

UNIT–III

CALL Lab: Syllable and Syllabification

ICS Lab: Describing Objects/ Situations/ People

UNIT –IV

CALL Lab: Word Stress and Intonation

ICS Lab: Information transfer – from visual to verbal - maps, charts, tables and graphs

UNIT –V

CALL Lab: Errors in Pronunciation - Accent - the Influence of Mother Tongue (MTI)
ICS Lab: Making a Short Speech – Extempore

ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

i) P –IV Processor
   a)Speed –2.8 GHZ
   b)RAM –512 MB Minimum
   c)Hard Disk –80 GB
ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Examination:

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 30 marks and 70 year-end Examination marks. Of the 30 marks, 20 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the other institution.

COURSE OUTCOMES:

After completion of the course the students will be able to:

1. Learn with precision through computer-assisted individualized and independent language learning to work independently in an engineering set-up.
2. Improve conversational reception and articulation techniques in the course of repetitive instruction thereby gaining confidence both in institutional and professional environment.
3. Acquire accuracy in pronunciation and restoring Standard English thereby crafting better command in English language so that the students have a cutting edge over others in society.
4. Imbibe appropriate use of language in situations where one works as an individual and as a leader/team player.
5. Display professional behaviors and body language.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/3/1.5

(R20A0281) BASIC ELECTRICAL ENGINEERING LAB

COURSE OBJECTIVES:

1. To design electrical systems.
2. To analyze a given network by applying various network theorems.
3. To expose the students to the operation of dc generator.
4. To expose the students to the operation of dc motor and transformer.
5. To examine the self excitation in dc generators.

CYCLE – I

1. Verification of KVL and KCL.
2. Verification of Thevenin's theorem.
3. Verification of Norton's theorem.
4. Verification of Super position theorem.
5. Verification of Reciprocity theorem.

CYCLE -II

6. Magnetization characteristics of DC shunt generator.
7. Swinburne's test on DC shunt machine.
8. Brake test on DC shunt motor.
9. OC &SC tests on single phase transformer.
10. Load test on single phase transformer.

COURSE OUTCOMES:

At the end of the course, students would be able to

1. Calculate the branch currents and mesh voltages by conducting KCL and KVL test on given circuit.
2. Prove the various circuit theorems like Superposition, Thevenin's, Norton's, and Reciprocity theorems.
3. Plot the Magnetization characteristics of DC shunt generator.
4. Plot the characteristics of DC shunt motor by conducting Brake Test.
5. Determine the Efficiency of single-phase transformer by conducting OC, SC and Load tests.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/3/1.5

(R20A0581) PROGRAMMING FOR PROBLEM SOLVING LAB

Program Objectives:

1. To understand the various steps in Program development.
2. To understand the basic concepts in C Programming Language.
3. To learn how to write modular and readable C Programs.
4. To learn to write programs (using structured programming approach) in C to solve problems.
5. To introduce basic data structures such as lists, stacks and queues.

Week 1:

a. Write a program to find sum and average of three numbers
b. Write a program to calculate simple interest(SI) for a given principal (P), time (T), and rate of interest (R) (SI = P*T*R/100)

Week 2:

a. Write a program to swap two variables values with and without using third variable
b. Write a program to find the roots of a quadratic equation.

Week 3:

a. Write a program to find the sum of individual digits of a given positive integer.
b. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result.
(Consider the operators +,-,*, /, % and use Switch Statement)

Week 4:

a. Write a program to find both the largest and smallest number in a list of integers.
b. Write a program to find the sum of integer array elements using pointers

Week 5:

a. Write a program to perform addition of two matrices.
b. Write a program to perform multiplication of two matrices.

Week 6:

a. Write a program to find the length of the string using Pointer.
b. Write a program to count the number of lines, words and characters in a given text.

Week 7:

a. Write a program to find factorial of a given integer using non-recursive function and recursive function.
b. Write program to find GCD of two integers using non-recursive function and recursive function.

Week 8:

a. Write a program using user defined functions to determine whether the given string is palindrome or not.
b. Write a Program to swap the values of two variables using
i) Call by Value ii) Call by Reference

Week 9:

a. Write a program to find the sum of integer array elements using pointers, use dynamic memory allocation to allocate memory.
b. Write a program to perform subtraction of two matrices, Design functions to perform read, display and subtract

Week 10:

a. Write a program to create a structure named book and display the contents of a book.
b. Write a Program to Calculate Total and Percentage marks of a student using structure.

Week 11:

a. Write a program that uses functions to perform the following operations:
i) Reading a complex number ii) Writing a complex number
iii) Addition of two complex numbers iv) Multiplication of two complex numbers
b. Write a program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)

Week 12:

a. Write a program to copy the contents of one file to another.
b. Write a program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third.

Week 13:

a. Write a program for static implementation of stack
b. Write a program for static implementation of Queue

Week 14:

a. Write a program to perform various operations on single list

Week 15:

a. Write a program for dynamic implementation of stack
b. Write a program for Dynamic implementation of Queue

Case Studies

Case 1: Student Record Management System

The main features of this project include basic file handling operations; you will learn how to add, list, modify and delete data to/from file. The source code is relatively short, so thoroughly go through the mini project, and try to analyze how things such as functions, pointers, files, and arrays are implemented.

Currently, listed below are the only features that make up this project, but you can add new features as you like to make this project a better one!

- Add record
- List record
- Modify record
- Delete record

Case 2: Library Management System

This project has 2 modules.

1. Section for a librarian
2. Section for a student

A librarian can add, search, edit and delete books. This section is password protected. That means you need administrative credentials to log in as a librarian.

A student can search for the book and check the status of the book if it is available. Here is list of features that you can add to the project.

1. You can create a structure for a student that uniquely identify each student. When a student borrows a book from the library, you link his ID to Book ID so that librarian can find how a particular book is borrowed.
2. You can create a feature to bulk import the books from CSV file.
3. You can add REGEX to search so that a book can be searched using ID, title, author or any of the field.
4. You can add the student login section.

TEXT BOOKS

1. C Programming and Data Structures, P.Padmanabham, Third Edition, BS Publications
2. Computer programming in C.V.RAjaraman, PHI Publishers.
3. C Programming, E.Balagurusamy, 3rd edition, TMHPublishers.
4. C Programming, M.V.S.S.N Venkateswarlu and E.V.Prasad,S.Chand Publishers
5. Mastering C,K.R.Venugopal and S.R.Prasad, TMH Publishers.

Program Outcomes:

1. Ability to apply solving and logical skills to programming in C language.
2. Able to apply various conditional expressions and looping statements to solve problems associated with conditions.
3. Acquire knowledge about role of Functions involving the idea of modularity.
4. Understand and apply the Concept of Array, Strings and pointers dealing with memory management.
5. Acquire knowledge about basic data structures and their implementation.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

1/-/-/1

(R20A0003) HUMAN VALUES AND PROFESSIONAL ETHICS

COURSE OBJECTIVES:

This introductory course input is intended:

1. To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
2. To facilitate the development of a holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of value based living in a natural way.
3. To highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.
4. To make the students to understand the Harmony in the nature and existence.
5. To implement the Holistic understand of harmony to professional ethics.

UNIT - I:

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education: Understanding the need, basic guidelines, content and process for Value Education.

Self-Exploration - what is it? - its content and process; 'Natural Acceptance' and Experiential Validation - as the mechanism for self-exploration. Continuous Happiness and Prosperity

A look at basic Human Aspirations- Right understanding, Relationship and Physical Facilities - the basic requirements for fulfillment of aspirations of every human being with their correct priority. Understanding Happiness and Prosperity correctly - A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

UNIT - II:

Understanding Harmony in the Human Being - Harmony in Myself! : Understanding human being as a co-existence of the sentient 'I' and the material 'Body'.

Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).

Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail. Programs to ensure Sanyam and Swasthya.

UNIT - III:

Understanding Harmony in the Family and Society - Harmony in Human - Human Relationship: Understanding harmony in the Family the basic unit of human interaction. Understanding values in human - human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

Understanding the meaning of Vishwas; Difference between intention and competence. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship.

Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astiva as comprehensive Human Goals. Visualizing a universal harmonious order in society - Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) - from family to world family!

UNIT - IV:

Understanding Harmony in the nature and Existence - Whole existence as Coexistence: Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature - recyclability and self-regulation in nature.

Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space. Holistic perception of harmony at all levels of existence.

UNIT - V:

Implications of the above Holistic Understanding of Harmony on Professional Ethics: Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basic for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics:

a. Ability to utilize the professional competence for augmenting universal human order.
b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.
c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

TEXT BOOKS:

1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rd Edition.

REFERENCE BOOKS:

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
2. E. F. Schumancher, 1973, Small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
3. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.
5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
6. A. N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.
9. E G Seebauer & Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.
10. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Humna Values), Eastern Economy Edition, Prentice Hall of India Ltd.

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education website, http://www.uptu.ac.in
2. Story of Stuff, http://www.storyofstuff.com
3. Al Gore, An Inconvenient Truth, Paramount Classics, USA
4. Charle Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology - the Untold Story

COURSE OUTCOMES:

1. The students will be able to obtain happiness and prosperity in their life.
2. They will develop harmony at all levels.
3. They can have satisfying human behavior throughout their life
4. The students will be able to understand the Harmony in the nature and existence.
5. The students of Holistic understand of Harmony in Professional Ethics.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

2/-/-/2

(R20A0002) PROFESSIONAL ENGLISH

INTRODUCTION:

English is a tool for global communication and is the dominant language, which is sweeping almost all the fields in the world. It has become a necessity for people to speak in English comfortably, if they want to enter the global workforce. Hence, the course is designed to help the students to meet the global standards. Each unit focuses on English skill-set to improve: Interview skills, giving presentations and professional etiquette.

COURSE OBJECTIVES:

1. To enrich students to express themselves appropriately and fluently in professional contexts.
2. To enhance their employability through regular participation in group discussions and interview skills.
3. To lay foundation with writing strategies for the future workplace needs.
4. To acquaint students with different components of professional presentation skills.
5. To equip students with necessary training in listening to comprehend dialects of English language.

UNIT-I

Listening - Listening for General Details.
Speaking - Description of Pictures, Places, Objects and Persons

NOTE: Listening and Speaking tasks are solely for lab purpose and not for testing in the examinations.

Extract - The summary of Asimov's *Nightfall*
Grammar - If clauses
Vocabulary - Technical Vocabulary
Writing - Paragraph Writing

Unit –II

Listening - Listening for Specific Details
Speaking - Oral presentations

NOTE: Listening and Speaking tasks are solely for lab purpose and not for testing in the examinations.

Extract - A literary analysis of Asimov's *Nightfall*
Grammar - Transformation of Sentences
Vocabulary - Idioms
Writing - Abstract Writing

Unit –III

Listening - Listening for Gist
Speaking - Mock Interviews

NOTE: Listening and speaking tasks are solely for lab purpose and not for testing in the examinations.

Extract - Character sketches of Asimov's *Nightfall's* - protagonists and
antagonists - Dr. Susan Calvin, Mike Donovan, Stephen Byerley, Francis Quinn
Grammar - Transitive and Intransitive Verbs
Vocabulary - Standard Abbreviations (Mini Project)
Writing - Job Application – Cover letter

Unit – IV

Listening - Listening for Vocabulary
Speaking - Telephonic Expressions

NOTE: Listening and Speaking tasks are solely for lab purpose and not for testing in the examinations.

Extract - Theme of Asimov's *Nightfall*
Grammar - Auxiliary verbs, Degrees of Comparison
Vocabulary - Word Analogy
Writing - Job Application - Resume

Unit – V

Listening - Critical Listening (for attitude and Opinion)
Speaking - Group discussion

NOTE: Listening and Speaking tasks are solely for lab purpose and not for testing in the examinations.

Extract - Asimov's *Nightfall*: A Science Fiction
Grammar - Common Errors, Prepositions
Vocabulary - Homonyms, homophones and homographs
Writing - Report Writing

* Isaac Asimov's *Nightfall* for intensive and extensive reading
* Exercises apart from the text book shall also be referred for classroom tasks.

REFERENCE BOOKS:

1. Nightfall, Isaac Asimov; Robert Silverberg, 1990
2. Practical English Usage. Michael Swan. OUP. 1995.
3. Remedial English Grammar. F.T. Wood. Macmillan.2007
4. On Writing Well. William Zinsser. Harper Resource Book. 2001
5. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
6. Communication Skills. Sanjay Kumar and Pushpa Lata. Oxford University Press. 2011.
7. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

COURSE OUTCOMES:

Students will be able to:

1. Analyze and interpret a diverse range of engineering concepts through the synthesis of information
2. Understand the impact of professional engineering solutions is societal contexts and demonstrate its knowledge
3. Achieve communicative ability in their personal and professional relations with clarity of speech and creativity in content
4. Function effectively as an individual and a team; and would be able to prepare themselves to be market ready
5. Comprehend and write effective reports and design documentation, manage projects and make effective presentations.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/1/-/4

(R20A0022) MATHEMATICS-II

COURSE OBJECTIVES:

1. The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data, also used to find the roots of an equation and to solve differential equations.
2. The objective of interpolation is to find an unknown function which approximates the given data points and the objective of curve fitting is to find the relation between the variables x and y from given data and such relationships which exactly pass through the data (or) approximately satisfy the data under the condition of sum of least squares of errors.
3. PDE aims at forming a function with many variables and also their solution methods, Method of separation of variables technique is learnt to solve typical second order PDE.
4. Evaluation of multiple integrals.
5. In many engineering fields the physical quantities involved are vector valued functions. Hence the vector calculus aims at basic properties of vector-valued functions and their applications to line, surface and volume integrals.

UNIT – I: Solutions of algebraic, transcendental equations and Interpolation

Solution of algebraic and transcendental equations: Introduction, Bisection Method, Method of false position, Newton-Raphson method and their graphical interpretations.

Interpolation: Introduction, errors in polynomial interpolation, Finite differences - Forward differences, Backward differences, Central differences. Newton's formulae for interpolation, Gauss's central difference formulae, Interpolation with unevenly spaced points - Lagrange's Interpolation.

UNIT – II: Numerical Methods

Numerical integration : Generalized quadrature - Trapezoidal rule, Simpson's $1/3^{rd}$ and Simpson's $3/8^{th}$ rules.

Numerical solution of ordinary differential equations: Solution by Taylor's series method, Euler's method, Euler's modified method, Runge-Kutta fourth order method.

Curve fitting : Fitting a straight line, second degree curve, exponential curve, power curve by method of least squares.

UNIT III: Partial Differential Equations

Introduction, formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order Lagrange's linear equation and non-linear equations, Charpit's method, Method of separation of variables for second order equations and applications of PDE to one dimensional equation (Heat equation).

Unit IV: Double and Triple Integrals

Double and triple integrals (Cartesian and polar), Change of order of integration in double integrals, Change of variables (Cartesian to polar).

Unit V: Vector Calculus

Introduction, Scalar point function and vector point function, Directional derivative, Gradient, Divergence, Curl and their related properties, Laplacian operator, Line integral - work done, Surface integrals, Volume integral. Green's theorem, Stoke's theorem and Gauss's Divergence theorems (Statement & their Verification).

TEXT BOOKS:

1. Higher Engineering Mathematics by B V Ramana ., Tata McGraw Hill.
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Mathematical Methods by S.R.K Iyenger, R.K.Jain, Narosa Publishers.

REFERENCE BOOKS:

1. Elementary Numerical Analysis by Atkinson-Han, Wiley Student Edition.
2. Advanced Engineering Mathematics by Michael Greenberg –Pearson publishers.
3. Introductory Methods of Numerical Analysis by S.S. Sastry, PHI

COURSE OUTCOMES:

After learning the concepts of this paper the student will be able to independently

1. Find the roots of algebraic, non algebraic equations and predict the value at an intermediate point from a given discrete data.
2. Find the most appropriate relation of the data variables using curve fitting and this method of data analysis helps engineers to understand the system for better interpretation and decision making.
3. Solve first order linear and non-linear partial differential equations which are very important in engineering field.
4. Evaluate multiple integrals; hence this concept can be used to evaluate Volumes and Areas of an object.
5. Evaluate the line, surface, volume integrals and converting them from one to another using vector integral theorems.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0011) APPLIED PHYSICS

COURSE OBJECTIVES:

1 To analyze the ordinary light with a laser light and realize the transfer of light through optical fibers.
2 To identify dual nature of the matter and behavior of a particle quantum mechanically.
3 To explore band structure of the solids and classification of materials.
4 To acquire the basic knowledge of various types of semiconductor devices and find the applications in science and technology.
5 To Compare dielectric and magnetic properties of the materials and enable them to design and apply in different fields.

UNIT – I

LASERS & FIBER OPTICS

Lasers: Characteristics of lasers, Absorption, Spontaneous and Stimulated emissions, population inversion, meta stable state, types of pumping, lasing action, construction and working of Ruby Laser, Helium-Neon Laser, Semiconductor diode Laser, Applications of lasers.

Fiber Optics: Introduction to optical fiber, Construction and working principle of an Optical Fiber, Acceptance angle and Numerical aperture, Types of Optical fibers - Mode and Propagation through step and graded index fibers ,Losses in optical fiber, Optical Fiber in Communication System, Applications of optical fibers.

UNIT – II

QUANTUM MECHANICS

Wave nature of particles, de Broglie's hypothesis, matter waves, Heisenberg's uncertainty principle, Davisson and Germer's experiment, G.P Thomson experiment, Schrodinger time-independent wave equation-significance of wave function, particle in one dimensional square well potential.

UNIT – III

ELECTRONIC MATERIALS

Free electron theory(Classical & Quantum)- Assumptions, Merits and drawbacks, Fermi level, Density of states, Periodic potential, Bloch's theorem, Kronig – Penny model (qualitative) , E – K diagram, Effective mass, Origin of energy bands in solids, Classification of materials : Metals, semiconductors and insulators.

UNIT-IV
SEMICONDUCTOR PHYSICS

Intrinsic and extrinsic semiconductors, Direct and indirect band gap semiconductors, Carrier concentration in intrinsic and extrinsic semiconductors. Dependence of Fermi level on carrier concentration and temperature, carrier transport: mechanism of diffusion and drift, Formation of PN junction, V-I characteristics of PN diode, energy diagram of PN diode, Hall experiment, semiconductor materials for optoelectronic devices - LED, Solar cell.

UNIT – V:
DIELECTRICS AND MAGNETIC PROPERTIES OF MATERIALS

Dielectrics: Introduction, Types of polarizations (Electronic and Ionic) and calculation of their polarizabilities, internal fields in a solid, Clausius-Mossotti relation.

Magnetism: Introduction, origin of magnetism, Bohr magneton, classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Properties of anti-ferro and ferri magnetic materials, Hysteresis curve based on domain theory, Soft and hard magnetic materials.

TEXT BOOKS:

1. Engineering Physics by Kshirsagar & Avadhanulu, S Chand publications.
2. Engineering Physics- B.K.Pandey, S.Chaturvedi, Cengage Learning.

REFERENCES:

1. Engineering Physics – R.K. Gaur and S.L. Gupta, DhanpatRai Publishers.
2. Engineering Physics, S Mani Naidu- Pearson Publishers.
3. Engineering physics 2nd edition –H.K. Malik and A.K. Singh.
4. Engineering Physics – P.K. Palaniswamy, Scitech publications.
5. Physics by Resnick and Haliday.

COURSE OUTCOMES:

After completion of studying Applied Physics the student is able to

1 Observe the properties of light and its engineering applications of laser in fiber optic communication systems.
2 Apply the basic principles of quantum mechanics and the importance of behavior of a particle.
3 Find the importance of band structure of solids and their applications in various electronic devices.
4 Evaluate concentration & estimation of charge carriers in semiconductors and working principles of PN diode.
5 Examine dielectric, magnetic properties of the materials and apply them in material technology.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0401) ANALOG & DIGITAL ELECTRONICS

COURSE OBJECTIVES:

The main objectives of the course are:

1. To familiarize with the principal of operation, analysis and design of pn junction diode.
2. To study the construction of BJT and its characteristics in different configurations.
3. To study the construction and characteristics of JFET and MOSFET.
4. To study basic number systems codes and logical gates.
5. To introduce the methods for simplifying Boolean expressions and design of combinational circuits.

UNIT-I

P-N Junction diode: Qualitative Theory of P-N Junction, P-N Junction as a diode, diode equation, volt-ampere characteristics temperature dependence of V-I characteristic, ideal versus practical, diode equivalent circuits, Zener diode characteristics.

UNIT-II

Bipolar Junction Transistor: The Junction transistor, Transistor construction, Transistor current components, Transistor as an amplifier, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations. α and β Parameters and the relation between them, BJT Specifications.

UNIT-III

FIELD EFFECT TRANSISTOR: JFET-Construction, principle of Operation, Volt–Ampere characteristics, Pinch- off voltage. Small signal model of JFET. FET as Voltage Variable Resistor, Comparison of BJT and FET. MOSFET- Construction, Principle of Operation and symbol, MOSFET characteristics in Enhancement and Depletion modes.

UNIT IV:

Number System and Boolean Algebra: Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal, Unit Distance Code, Digital Logic Gates (AND, NAND, OR, NOR, EX-OR, EX-NOR), Properties of XOR Gates, Universal Gates, Basic Theorems and Properties, Switching Functions, Canonical and Standard Form.

UNIT-V

Minimization Techniques: The Karnaugh Map Method, Three, Four and Five Variable Maps, Prime and Essential Implications, Don’t Care Map Entries, Using the Maps for Simplifying, Multilevel NAND/NOR realizations.

Combinational Circuits: Design procedure – Half adder, Full Adder, Half subtractor, Full subtractor, Multiplexer/Demultiplexer, decoder, encoder, Code converters, Magnitude Comparator.

TEXT BOOKS:

1. "Electronic Devices & Circuits", Special Edition – MRCET, McGraw Hill Publications, 2017.
2. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGrawHill.
3. Electronic Devices and Circuits, S.Salivahanan, N.Sureshkumar, McGrawHill.
4. M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003
5. Switching and Finite Automata Theory- ZviKohavi& Niraj K. Jha, 3rdEdition, Cambridge.

REFERENCE BOOKS:

1. Electronic Devices and Circuits,K.Lal Kishore B.SPublications
2. Electronic Devices and Circuits, G.S.N. Raju, I.K. International Publications, New Delhi, 2006.
3. John F.Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006
4. John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.
5. Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.

COURSE OUTCOMES:

After completion of the course, the student will be able to:

1. Understand the principal of operation, analysis and design of pn junction diode.
2. Understand the construction of BJT and its characteristics in different configurations.
3. Understand the construction and characteristics of JFET and MOSFET.
4. Understand basic number systems codes and logical gates.
5. Understand the methods for simplifying Boolean expressions and design of combinational circuits

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0502) PYTHON PROGRAMMING

COURSE OBJECTIVES:

1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and call them.
4. To use Python data structures –- lists, tuples, dictionaries.
5. To do input/output with files in Python.

UNIT I

Introduction to Python Programming Language: Introduction to Python Language and installation, overview on python interpreters, working with python, Numeric Data Types: int, float, Boolean, complex and string and its operations, Standard Data Types: List, tuples, set and Dictionaries, Data Type conversions, commenting in python.

UNIT II

Variables and Operators: Understanding Python variables, Multiple variable declarations, Python basic statements, Python basic operators: Arithmetic operators, Assignment operators, Comparison operators, Logical operators, Identity operators, Membership operators, Bitwise operators, Precedence of operators, Expressions.

UNIT III

CONTROL FLOW AND LOOPS

Conditional (if), alternative (if-else), chained conditional (if- elif -else), Loops: For loop using ranges, string, Use of while loops in python, Loop manipulation using pass, continue and break

UNIT IV

Functions

Defining Your Own Functions, Calling Functions, passing parameters and arguments, Python Function arguments: Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions (Function Returning Values), Scope of the Variables in a Function - Global and Local Variables. Powerful Lambda functions in python.

UNIT V

I/O and Error Handling in Python

Introduction, Access Modes, Writing Data to a File, Reading Data from a File, Additional File Methods introduction to Errors and Exceptions, Handling IO Exceptions, Run Time Errors, Handling Multiple Exceptions.

Introduction to Data Structures: What are Data structures, Types of Data structures, Introduction to Stacks and Queues.

TEXT BOOKS:

1. R. Nageswara Rao, “Core Python Programming”, dream tech
2. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist‘‘, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016.
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
4. Data Structures and Algorithmic Thinking with Python by Narasimha Karumanchi

REFERENCE BOOKS:

1. Core Python Programming, W.Chun, Pearson.
2. Introduction to Python, Kenneth A. Lambert, Cengage
3. Learning Python, Mark Lutz, Orielly

COURSE OUTCOMES:

Upon completion of the course, students will be able to

1. Read, write, execute by hand simple Python programs.
2. Structure simple Python programs for solving problems.
3. Decompose a Python program into functions.
4. Represent compound data using Python lists, tuples, and dictionaries.
5. Read and write data from/to files in Python Programs

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/3/1.5

(R20A0082) APPLIED PHYSICS LAB

COURSE OBJECTIVES:

Students can be able to

1. Identify the specific types of elastic and electrical nature of materials in physics lab.
2. Observe concepts of magnetism in physics lab.
3. Analyze propagation of light in various optical devices practically.
4. Examine various opto electronic devices practically
5. Well-equipped with the properties of semiconductor devices in physics lab.

LIST OF EXPERIMENTS:

1. Torsional pendulum-Rigidity modulus of given wire.
2. Melde's experiment –Transverse and Longitudinal modes.
3. Stewart and Gee's method- Magnetic field along the axis of current carrying coil.
4. Spectrometer-Dispersive power of the material of a prism
5. Diffraction grating-using laser -Wavelength of light.
6. Newton's Rings –Radius of curvature of Plano convex lens.
7. LED -Characteristics of LED.
8. Solar cell -Characteristics of a Solar cell.
9. Optical fiber- Evaluation of numerical aperture of optical fiber.
10. Hall Effect –To study Hall effect in semiconducting samples.

REFERENCE BOOKS:

1. Practical physics by Dr. Aparna, Dr K.V Rao, V.G.S.Publications.
2. Engineering physics practical lab manual – MRCET.

COURSE OUTCOMES:

1 Students are able to measure the elastic constants of the given material of the wire and determine the ac frequency of vibrating bar.

2 Students are able to determine the magnetic induction of a circular coil carrying current by applying the principles of terrestrial magnetism.

3 Students are able to frame relativistic ideas of light phenomenon

4 Students are able to achieve the analysis of V-I characteristics of opto electronic devices

5 Students are able to determine the carrier concentration and identify the given semiconductor material with the help of Hall Effect.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/3/1.5

(R20A0582) PYTHON PROGRAMMING LAB

COURSE OBJECTIVES:

1. To know the Syntax and Semantics in Python.
2. To understand the different data types Lists, Dictionaries in Python.
3. To know how to execute the programs using loops and control statements
4. How to make decision and to create functions in Python
5. To handle files and exception Handling in Python

Week 1:

A) Write python program to print Hello World
B) Write a python program to get string, int, float input from user
C) Write a python program to add 2 numbers

Week 2:

A) Create a list and perform the following methods
   1) insert() 2) remove() 3) append() 4) len() 5) pop() 6) clear()
B) Write a python program to find the length of list?
C) Write a python program to find the smallest and largest number in the list?

Week 3:

A) Create a tuple and perform the following methods
   1) Add items 2) len() 3) check for item in tuple 4)Access iems
B) Write a python program using the following methods: 1) count 2) index
C) Write a python program using “+” and “*” operations which resulting a new tuple?

Week 4:

A) Create a dictionary and apply the following methods
   1) Print the dictionary items 2) access items 3) use get() 4)change values 5) use len()
B) Write a python code to convert list of tuples into dictionaries?
C) Write python program to store data in list, tuple, set, dictionary and then try to print them.

Week 5:

A) Write a python program to perform arithmetic, assignment, logical and comparison operators?
B) Write a Python program to add two positive integers without using the '+' operator. (use bitwise operator)
C) Write a Python program to perform the basic four operators (+, -, *, /)

Week 6:

A) Write a simple python program to declare a variable in different possible ways?
B) Write a python program to show precedence of operators using the expression: z = (v+w) * x / y
C) Write a python program to check whether the values of a list exist or not (use membership operator) and also perform identity operation?

Week 7:

A) Write a python program to print a number is positive/negative using if-else.
B) Write a python program to find largest number among three numbers.
C) Write a python Program to read a number and display corresponding day using if_elif_else?
D) Write a python program to print list of numbers using range and for loop

Week 8:

A) Write a python code to print the sum of natural numbers using while loop?
B) Write a python program to print the factorial of given number?
C) Write a python program to find the sum of all numbers stored in a list using for loop?

Week 9:

A) Write a Python function that takes two lists and returns True if they are equal otherwise false
B) Write python program in which an function is defined and calling that function prints Hello World
C) Write python program in which an function(with single string parameter) is defined and calling that function prints the string parameters given to function.
D) Write a python program using with any one of python function argument?

Week 10:

A) Write a program to double a given number and add two numbers using lambda()?
B) Write a program for filter() to filter only even numbers from a given list.
C) Write a program for map() function to double all the items in the list?
D) Write a program to find sum of the numbers for the elements of the list by using reduce()?

Week 11:

A) Write a python program to open and write “hello world” into a file?
B) Write a python program to write the content “hi python programming” for the existing file.
C) Write a python program to read the content of a file?

Week 12:

A) Write a program to implement stack using array.
B) Write a program to implement Queue using array.

TEXT BOOKS:

1. R. Nageswara Rao, "Core Python Programming", dream tech
2. Allen B. Downey , " Think Python: How to Think Like a Computer Scientist", Second Edition,
   Updated for Python 3, Shroff/O'Reilly Publishers, 2016.

COURSE OUTCOMES:

After completion of the course, Students will be able to:

1. Evaluate Problem solving and programming capability
2. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
3. Implement conditional and loop for python programs
4. Express different Decision Making statements and Functions
5. Understand and summarize different File handling operations and exceptions

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/2/1

(R20A0084) ENGINEERING AND IT WORKSHOP

It is consisting of 2 parts: **Part I: IT Workshop**
Part II: Engineering Workshop

COURSE OBJECTIVES:

1. Understand the internal structure of computer system and learn to diagnose minor problems with the computer functioning.
2. Know the proper usage and threats of the World Wide Web & Study in detail about the various features of Ms-Word, Excel, PowerPoint and Libre Office
3. To obtain the knowledge about Electrical wiring and Soldering – Desoldering procedures.
4. To provide hands on experience in usage of different engineering materials, tools equipments and processes which are common in the engineering field.
5. To develop professional attitude, team work, precision and safety practices at work place.

Part I: IT WORKSHOP

Task- 1: PC HARDWARE

Identification of the peripherals of a computer, components in a CPU and its functions. Block diagram of the CPU along with the configuration of each peripheral. Functions of Motherboard. Assembling and Disassembling of PC. Installation of OS. Basic Linux commands.

Task- 2: TROUBLESHOOTING

Hardware Troubleshooting: Students are to be given a PC which does not boot due to proper assembly or defective peripherals and the students should be taught to identify and correct the problem.

Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

Task 3: INTERNET

Web Browsers, Access of websites, Surfing the Web, Search Engines, Customization of web browsers, proxy settings, bookmarks, search toolbars, pop-up blockers. Antivirus downloads, Protection from various threats.

MS OFFICE

Task 4: MICROSOFT WORD

Overview of MS word features. Usage of Hyperlink, Symbols, Spell Check, Track Changes. Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word. Using Word to create Project Certificate, Project Abstract, News Letter, Resume.

Task 5: MICROSOFT EXCEL

Overview of Excel Features Excel formulae & Functions, conditional formatting, Charts, Hyper linking, Renaming and Inserting worksheets, Data Analysis functions.
Creating a Scheduler (Features:- Gridlines, Format Cells, Summation, auto fill, Formatting)
Calculating GPA (Features:- Cell Referencing, Formulae and functions in excel)

Task 6: MICROSOFT POWER POINT

Overview of PowerPoint features, Insertion of images, slide transition, Custom animation, Hyperlinks.

Task 7: LIBRE OFFICE

Overview of LibreOffice and its features of Writer, Calc, Impress, Draw, Base, Math, Charts.
Libre office Math: Introduction, Creating & Editing Formulas, formulas as separated documents or files, formulas in office document, Creating formulas, Formula layout
Libre Office Draw: Introduction, Basic shapes, working with objects, flowcharts, organization charts.

PART II: ENGINEERING WORKSHOP

A. List of Experiments:

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Illumination wiring
3. Stair case wiring
4. Soldering and Desoldering practice – components, devices and circuits using general purpose PCB.

B. TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry:

To prepare T-Lap Joint, Dovetail Joint.
To prepare Mortise & Tenon Joint.

2. Fitting:

To prepare V-Fit, Dovetail Fit & Semi-circular fit.

3. Tin-Smithy:

To make Square Tin, Rectangular Tray & Conical Funnel.

Trades to demonstrate:

1. Plumbing
2. Foundry
3. Welding
4. Black smithy
5. Metal cutting (Water Plasma)

TEXT BOOKS: IT WORKSHOP

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education
2. Excel Functions and Formulae, Bernd held, Theodor Richardson, Third Edition
3. Libre Office Documentation: https://documentation.libreoffice.org/en/english-documentation

TEXT BOOKS: ENGINEERING WORKSHOP

1. Workshop Manual, P. Kannaiah and K. L. Narayana, 3rd Edition, Scitech,2015
2. Printed Circuit Boards - Design, Fabrication, Assembly and Testing, R. S. Khandpur, Tata McGraw-Hill Education, 2005.

COURSE OUTCOMES:

1. Ability to identify, assemble and troubleshoot the major components of a computer and perform the installation of Operating System.
2. Capacity to make effective usage of the internet for academics and develop professional documents, spreadsheets and presentations.
3. Students will be able to understand the domestic, illumination, stair-case wiring procedures and soldering de soldering practice
4. The student will have hands-on experience on manufacturing of components using different trades of engineering processes
5. The student will be able to perform in a team, adhering to industrial safety practices and follow professional working standards.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

1/-/-/1

(R20A0064) FINANCIAL INSTITUTIONS, MARKETS AND SERVICES

COURSE OBJECTIVES:

1. To expose students towards a clear understanding of Financial Markets in India, their operations and relevant development.
2. To lay foundation and equip them with the knowledge of Financial Services, related institutions and their functions.
3. To provide awareness of operations of Financial Markets, Regulators and Shareholders
4. To Provide knowledge in Innovations and technologies of Financial Instruments and Financial Services.
5. To allow them to understand Banking and Non-Banking Institutions operations and their services.

UNIT-I: INTRODUCTION

Financial System and Economic Development - Indicators of Financial Development - Concepts related to Financial Markets, Institutions and Services

Regulatory and Promotional Institutions: Functions and Roles of RBI, IRDA, SEBI.

UNIT II: COMMERCIAL BANKS

Functions of Commercial Banks. Performance and Competition of Public and Private Sector banks- NPA's Non-Banking Financial Institutions- Structure and Functions LIC - GIC & Mutual Funds.

UNIT-III: FINANCIAL AND SECURITIES MARKETS

Structure and Functions of Call Money Market. Government Securities Market: T-bills Market - Commercial Bills Market. Securities Market: Organization and Structure - Listing - Trading and Settlement.

UNIT-IV: ASSET/FUND BASED FINANCIAL SERVICES

Lease Finance - Hire Purchase Finance- Bills Discounting - Housing Finance - Venture Capital Financing. Fee-based Advisory Services: Stock Broking - Credit Rating Agencies.

UNIT-V: INVESTMENT BANKING

Introduction, Functions and activities, underwriting, bankers to an issue, debenture trustees, portfolio managers.

REFERENCE BOOKS:

1. L. M. Bhole, Financial Institutions and Markets, TMH.
2. M. Y. Khan, Financial Services, TMH.
3. Vasant Desai: Financial Markets and Financial Services, Himalaya.
4. Justin Paul and Padmalatha Suresh: Management of Banking and Financial Services, Pearson.
5. Gomez, Financial Markets, Institutions and Financial Services, PHI.

COURSE OUTCOMES

1. The students will get enormous knowledge on Financial Institutions, Securities Markets, and Financial Services.
2. It allows clear understandings of Banking and Non-Banking Financial Institutions operations.
3. Adequate knowledge to indulgence in Investments of financial products and services.
4. Comprehend various policy reforms that impact Financial Markets and Investments.
5. Availability of various fund based and Fee based financial services to get more exposure.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0012) ENGINEERING PHYSICS

COURSE OBJECTIVES

1. To gain the knowledge on the basic concepts of oscillations exhibited by various systems in nature.
2. To Study the basic concepts of light through interference and diffraction.
3. To explore band structure of the solids and classification of materials.
4. To Compare dielectric and magnetic properties of the materials and enable them to design and apply in different fields.
5. To analyze the ordinary light with a laser light and realize the transfer of light through optical fibers.

UNIT – I: HARMONIC OSCILLATIONS

Introduction to harmonic oscillators, simple harmonic oscillator: equation of motion and its solution (complex exponential method), damped harmonic oscillator: equation of motion and its solution, over, critical and lightly-damped oscillators; energy decay in damped harmonic oscillator, Quality factor (qualitative), forced damped harmonic oscillator: equation of motion and its solution.

UNIT – II: WAVEOPTICS

Interference- Introduction, Superposition of waves, interference of light by division of wave front-interference of reflected light in thin films, interference of light by division of amplitude- Newton's rings, Diffraction- difference between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction due to single slit, Diffraction grating- Grating spectrum and resolving power of grating.

UNIT- III: INTRODUCTION TO SOLIDS

Free electron theory (Classical & Quantum): Assumptions, Merits and drawbacks, Fermi level, Density of states, Periodic potential, Bloch's theorem, Kronig – Penny modal, E – K diagram, Effective mass, Origin of energy bands in solids, Classification of materials: Metals, semi-conductors and insulators.

UNIT – IV: DIELECTRICS AND MAGNETIC PROPERTIES OF MATERIALS

Dielectrics: Introduction, Types of polarizations (Electronic and Ionic) and calculation of their polarizabilities, internal fields in a solid, Clausius-Mossotti relation.

Magnetism: Introduction, Bohr magneton, classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Properties of anti-ferro and ferri magnetic

materials, Hysteresis curve based on Domain theory of ferro magnetism, Soft and hard magnetic materials.

UNIT-V: LASERS AND FIBER OPTICS:

LASERS: Characteristics of lasers, Absorption, Spontaneous and Stimulated emissions, Einstein's Coefficients, population inversion, meta stable state, types of pumping, lasing action, construction and working of Ruby Laser, Helium-Neon Laser,CO_2 Laser, Applications of lasers.

Fiber Optics: Introduction to optical fiber, Construction and working principle of an Optical Fiber, Acceptance angle and Numerical aperture, Types of Optical fibers - Mode and Propagation through step and graded index fibers, Attenuation in optical fiber, Optical Fiber in Communication System, Applications of optical fibers

TEXT BOOKS:

1. Engineering Physics by Arumugam, Anuradha publications.
2. Engineering Physics- B.K. Pandey, S. Chaturvedi, Cengage Learning.

REFERENCES:

1. Engineering Physics – R.K. Gaur and S.L. Gupta, DhanpatRai Publishers.
2. Engineering Physics, S Mani Naidu- Pearson Publishers.
3. Engineering physics 2^{nd} edition –H.K. Malik and A.K. Singh.
4. Engineering Physics – P.K. Palaniswamy, Scitech publications.
5. Physics by Resnick and Haliday.

COURSE OUTCOMES:

After completion of studying Engineering Physics the student is able to,

1. Analyze the various oscillations made by different oscillating bodies in nature.
2. Design different devices to go to maximum accuracy in measuring the dimensions optically.
3. Find the importance of band structure of solids and their applications in various electronic devices.
4. Examine dielectric, magnetic properties of the materials and apply them in material technology.
5. Observe the properties of light and its engineering applications of laser in fiber optic communication systems.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0013) ENGINEERING CHEMISTRY

COURSE OBJECTIVES

The students will be able to

1. Apply the electrochemical principles for construction of batteries and fuel cells.
2. Analyze engineering problems related to corrosion and develop different corrosion control techniques.
3. Identify different types of polymers, composites and their applications in various engineering fields.
4. Gain knowledge on wide variety of advanced materials like nano and smart materials which have excellent engineering properties.
5. Explain the principles and applications of photochemistry in engineering field.

UNIT-I: Electrochemistry

Introduction-Electrochemical cells - electrode potentials, construction and working of a galvanic cell, EMF and its applications - potentiometric titration; Nernst equation and its applications; electrochemical series and its applications. Batteries-classification of batteries, primary cell - lithium cells; secondary cells - lead acid battery and lithium ion battery; Fuel cells - H_2-O_2fuel cell; applications and advantages of fuel cells.

UNIT-II: Corrosion

Introduction-Causes and effects of corrosion; Theories of corrosion- chemical (oxidation corrosion) and electrochemical corrosion, Corrosion control methods - cathodic protection - sacrificial anodic protection and impressed current cathodic protection; protective coatings-galvanizing and tinning, electroplating (Cu plating) and electroless plating (Ni plating) - advantages and applications of electroplating/electroless plating.

Unit III: Functional Materials

Polymers: Introduction-thermoplastic and thermosetting resins, preparation, properties and engineering applications of Polyvinylchloride (PVC), Teflon (PTFE), Polymethyl methacrylate (PMMA), Polycarbonate, Bakelite. Conducting polymers-classification of conducting polymers-conduction mechanism in polyacetylene and applications of conducting polymers.

Composite materials: Introduction-Fiber reinforced plastics (FRPs)-Glass fiber reinforced, Carbon fiber reinforced plastics and their applications.

Unit IV Advanced Materials

Nanomaterials: Introduction and classification of nanomaterials; preparation of nanomaterials -Sol-gel and Chemical vapour deposition method; applications of nanomaterials (industrial and medicinal). Carbon nanotubes (CNTs)-applications.

Smart materials: Introduction-types of smart materials-examples and applications of piezoelectric materials, shape memory alloys, magnetostrictive materials and electro strictive materials.

Unit V Photochemistry

Introduction- Laws of photochemistry- Stark-Einstein law, Beer-Lambert's law, photochemical processes - Jablonsky diagram, applications of fluorescence, phosphorescence and photo sensitization.

Text Books:

1. Engineering Chemsitry by P.C. Jain & M. Jain: Dhanpat Rai Publishing Company (P) Ltd, New Delhi. 16th Edition.
2. Engineering Chemistry by Prasanta Rath, B. Rama Devi, C. H. Venkata Ramana Reddy, Subhendu Chakroborty,Cengage Learning Publication, India Private Limited, 2018.
3. Principles and Applications of Photochemistry by Brian Wardle Manchester Metropolitan University, Manchester, UK, A John Wiley & Sons, Ltd., Publication, 2009.
4. Engineering Analysis of Smart Material Systems by Donald J. Leo, Wiley, 2007.

Reference Books:

1. Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company (P) Ltd, New Delhi.
2. Engineering Chemistry, by S. S. Dara, S. Chand & Company Ltd, NewDelhi.
3. P.W. Atkins, J.D. Paula, "Physical Chemistry", Oxford, 8thedition (2006).
4. B.R. Puri, L.R. Sharma and M.S. Pathania, "Principles of Physical Chemistry", S. Nagin Chand & Company Ltd.,46th edition (2013).

COURSE OUTCOMES:

After completion of the course, the student will be able to

1. Relate the knowledge of operating principles of various types of electrochemical cells, including fuel cells and batteries, to optimize the need for sustainable development.
2. Analyze and develop technically sound, economic and sustainable solutions for complex engineering problems related to corrosion and its effects.
3. Identify, formulate and develop polymeric compounds used in various engineering materials for futuristic engineering applications.
4. Apply the knowledge of nanotechnology and smart materials to find solutions for various engineering problems.
5. Evaluate the photochemical and photo physical processes to reach substantiated conclusions in the technological arena.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/3/1.5

(R20A0083) ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LAB

PART-1: ENGINEERING PHYSICS LAB

COURSE OBJECTIVES

Students can be able to,

1. Identify the specific types of elastic and electrical nature of materials in physics lab.
2. Observe concepts of magnetism in physics lab.
3. Analyze propagation of light in various optical devices practically.
4. Examine various opto electronic devices practically

LIST OF EXPERIMENTS:

1. Torsional pendulum-Rigidity modulus of given wire.
2. Melde's experiment –Transverse and Longitudinal modes.
3. Stewart and Gee's method- Magnetic field along the axis of current carrying coil.
4. Spectrometer-Dispersive power of the material of a prism
5. Diffraction grating-using laser -Wave length of light.
6. Newton's Rings –Radius of curvature of Plano convex lens.
7. LED -Characteristics of LED.
8. LCR Circuit- To determine quality factor and resonant frequency of LCR circuit.
9. Optical fiber: Evaluation of numerical aperture of optical fiber.
10. Optical fiber: To determine the bending losses of Optical fibers.

Reference practical physics books:

1. Practical physics by Dr. Aparna, Dr K.V Rao, V.G.S. Publications.
2. Engineering physics practical lab manual – MRCET.

COURSE OUTCOMES:

After completion of the course, students will be able

1. To measure the elastic constants of the given material of the wire and also determine the ac frequency of vibrating bar.
2. To determine the magnetic induction of a circular coil carrying current by applying the principles of terrestrial magnetism.
3. To frame relativistic ideas of light phenomenon
4. To achieve the analysis of V-I characteristics of opto electronFAic devices
5. To determine the numerical aperture of optical fiber.

PART-2: ENGINEERING CHEMISTRY LAB

(Any Eight Experiment Compulsory)

OBJECTIVES

This course on chemistry lab is designed with 10 experiments in an academic year. The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student. At the end of the course the student is expected to

1. Provide the students with a solid foundation in chemistry laboratory required to solve engineering problems.
2. Practical implementation of fundamental concepts.

List of Experiments

Titrimetry:

1. Estimation of hardness of water by EDTA method.

Instrumental Methods:

Colorimetry:

2. Determination of Ferrous iron in cement by Colorimetric method
3. Estimation of Copper by Colorimetric method.

Conductometry:

4. Estimation of HCl by Conductometric titrations.
5. Estimation of Acetic acid in a mixture of HCl and Acetic acid by Conductometric titrations.

Potentiometry:

6. Estimation of HCl by Potentiometric titrations.
7. Estimation of Fe^{2+} by Potentiometry using $KMnO_4$.

Preparation:

8. Preparation of Aspirin.

Physical properties:

9. Determination of Viscosity of sample oil by Redwood Viscometer.
10. Determination of Surface Tension of a given liquid by Stalagmometer.

Text Book:

1. Inorganic quantitative analysis, Vogel
2. A text book on experiments and calculation in Engineering Chemistry by S.S. Dara

Suggested Readings:

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Text Book of Engineering Chemistry by R. N. Goyal and Harrmendra Goel, Ane Books Private Ltd.

OUTCOMES: At the end of the course

1. Students are able to estimate the total hardness present in a sample of water.
2. Ability to select lubricants for various purposes.
3. Ability to determine the surface tension of a given liquid.
4. Ability to prepare synthetic drug molecule.
5. Ability to know the strength of an acid by conductometric and potentiometric method and to find the Fe^{+2} and Cu^{2+} present in unknown substances using titrimetric and instrumental methods.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

3/-/-/3

(R20A0261) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OBJECTIVES:

1. To emphasize on the basic elements in electrical circuits.
2. To analyze DC Circuits and Single-Phase AC Circuits.
3. To illustrate various Electrical machines.
4. To understand various diodes and rectifiers.
5. To give an elementary treatment of Bipolar Junction Transistor.

UNIT –I:

Introduction to Electrical Circuits: Concept of Circuit and Network, Types of elements, R-L-C Parameters, Independent and Dependent sources, Source transformation and Kirchhoff's Laws. (Simple Problems).

UNIT –II:

Network Analysis: Network Reduction Techniques- Series and parallel connections of resistive networks, Star–to-Delta and Delta-to-Star Transformations for Resistive Networks and mesh analysis.

Network Theorems: Thevenin's Theorem, Norton's Theorem and Superposition Theorem.

UNIT-III:

Electrical Machines (elementary treatment only):

DC. Generator: principle of operation, constructional features, EMF equation. DC Motor: principle of operation, Back EMF, torque equation.

Single phase transformer: principle of operation, constructional features and EMF equation.

UNIT –IV:

Diodes: P-n junction diode, symbol, V-I Characteristics, Diode applications, Zener Diode: characteristics, Rectifiers – Half wave, Full wave and Bridge rectifiers (simple Problems).

UNIT –V:

Bipolar Junction Transistor (BJT): Construction, Principle of Operation, Amplifying Action, Common Emitter, Common Base and Common Collector configurations. (elementary treatment only).

TEXT BOOKS:

1. Basic Electrical and electronics Engineering –M S Sukija TK Nagasarkar Oxford University.
2. Basic Electrical and electronics Engineering-D P Kothari. I J Nagarath Tata McGraw Hill Education.
3. Electric Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.

REFERENCE BOOKS:

1. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
2. Millman's Electronic Devices and Circuits – J. Millman and C. C. Halkias, Satyabratajit, TMH, 2/e, 1998. 3. Engineering circuit analysis- by William Hayt and Jack E. Kemmerly, McGraw Hill Company, 6th edition.
3. Linear circuit analysis (time domain phasor and Laplace transform approaches)- 2nd edition by Raymond A. DeCarlo and Pen-Min-Lin, Oxford University Press-2004.
4. Network Theory by N. C. Jagan& C. Lakshminarayana, B.S. Publications.
5. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.

COURSE OUTCOMES:

At the end of the course students, would be able to

1. To analyze basic concepts of electrical circuits and networks.
2. To analyze and solve electrical circuits using network laws and theorems.
3. To understand the Constructional Details and Principle of Operation of DC Machines and Transformers.
4. To identify and characterize diodes and various types of transistors.
5. To Design and analyze the DC bias circuitry of BJT.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

-/-/3/1.5

(R20A0289) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

COURSE OBJECTIVES:

1. To design electrical systems.
2. To analyze a given network by applying various network theorems.
3. To expose the students to the operation of dc generator.
4. To expose the students to the operation of dc motor and transformer.
5. To get the knowledge using electrical measuring devices.

CYCLE – 1

1. Verification of KVL and KCL.
2. Verification of Thevenin's theorem.
3. Verification of Norton's theorem.
4. Verification of Superposition theorem.
5. Swinburne's test on DC shunt machine.
6. OC & SC tests on single phase transformer.

CYCLE – 2

7. PN Junction diode characteristics.
8. Zener diode characteristics.
9. Half wave rectifier with and without filter.
10. Full wave rectifier with and without filter.
11. Transistor CB Characteristics (Input and Output)
12. Transistor CE Characteristics (Input and Output)

NOTE: Any 10 of Above Experiments Are to Be Conducted

COURSE OUTCOME:

At the end of the course students, would be able to

1. Explain the concept of circuit laws and network theorems and apply them to laboratory measurements.
2. Be able to systematically obtain the equations that characterize the performance of an electric circuit as well as solving them.
3. Perform the required tests on transformers and DC motors.
4. Plot the characteristics of Zener diodes and transistors.
5. Determine the working of rectifiers in detail.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

I Year B. TECH **L/T/P/C**

2/-/2/3

(R20A0301) ENGINEERING GRAPHICS

COURSE OBJECTIVES:

1. To learn basic engineering graphic communication skills and concept from the given data.
2. To learn the 2D principles of orthographic projections
3. To know the 3D principles of isometric projections
4. To learn basic computer aided design skills using AutoCAD.
5. To know the conversion of orthographic views to isometric Views and vice versa

UNIT – I

Introduction to Engineering Graphics

Principles of Engineering Drawing/Graphics- various drawing instruments- convention in drawing- dimensioning- learning practice- BIS conventions.

Geometrical constructions

a) Polygons- construction of regular polygons (General Method)

Curves Used In Engineering Practice

b) Conic Sections (General Method - Eccentricity)
c) Cycloid, Epicycloid and Hypocycloid
d) Scales- Plain, Diagonal, and Vernier

UNIT – II

2D PROJECTIONS

Orthographic Projections: – Conventions – First angle, principles of orthographic projections

Projections of Points- in all four quadrants

Projections of Lines- parallel and inclined to both the reference planes

UNIT – III

Projections of Planes: Projection of regular planes, and plane inclined to both the reference planes

Projections of Solids: Projections of regular solids prism and pyramid inclined to both the reference planes.

UNIT – IV

3D Projections

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views, -conventions- planes, solids and compound solids

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions –Plane Figures, Simple and Compound Solids.

UNIT – V

Transformation of Projections: Conversions of Isometric view to orthographic view and vice versa

Demonstration: Basic principles of AutoCAD

TEXT BOOKS:

1. Engineering Drawing, Special Edition-MRCET, McGrahill Publishers, 2017.
2. Engineering Drawing, N.D. Bhatt
3. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New Age Publications.

REFERENCE BOOKS:

1. Engineering drawing – P.J. Shah. S.Chand Publishers.
2. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.

COURSE OUTCOMES:

1. The student will be capable to produce geometric construction, dimensioning and curves and detail drawings.
2. Compile projections of points, lines, planes and solids will improvise the student visualization skills.
3. A complete understanding on both orthographic and isometric projection is attained by the student.
4. Understand and visualize the 3D view of engineering objects, elaborate the conversions of 2D to 3D and vice versa.
5. The students will be familiarizing with basic computer aided design skills in graphical communication.

A thought beyond horizons of success committed for professional excellence



MRCET CAMPUS

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS INSTITUTION - UGC, GOVT. OF INDIA)

Affiliated to JNTUH; Approved by AICTE

NBA(Tier-1) & NAAC with A-GRADE | ISO 9001:2015

EAMCET/ECET/ICET/PGECET Code: MLRD

Dr. S Srinivasa Rao

B.Tech, M.Tech, Ph.D (JNTUH), MIEEE, MISTE, MIETE

Principal

Maisammaguda, Dhulapally, Secunderabd- 500 100

91335 55162 | 93481 61220

mrcet2004@gmail.com www.mrcet.ac.in