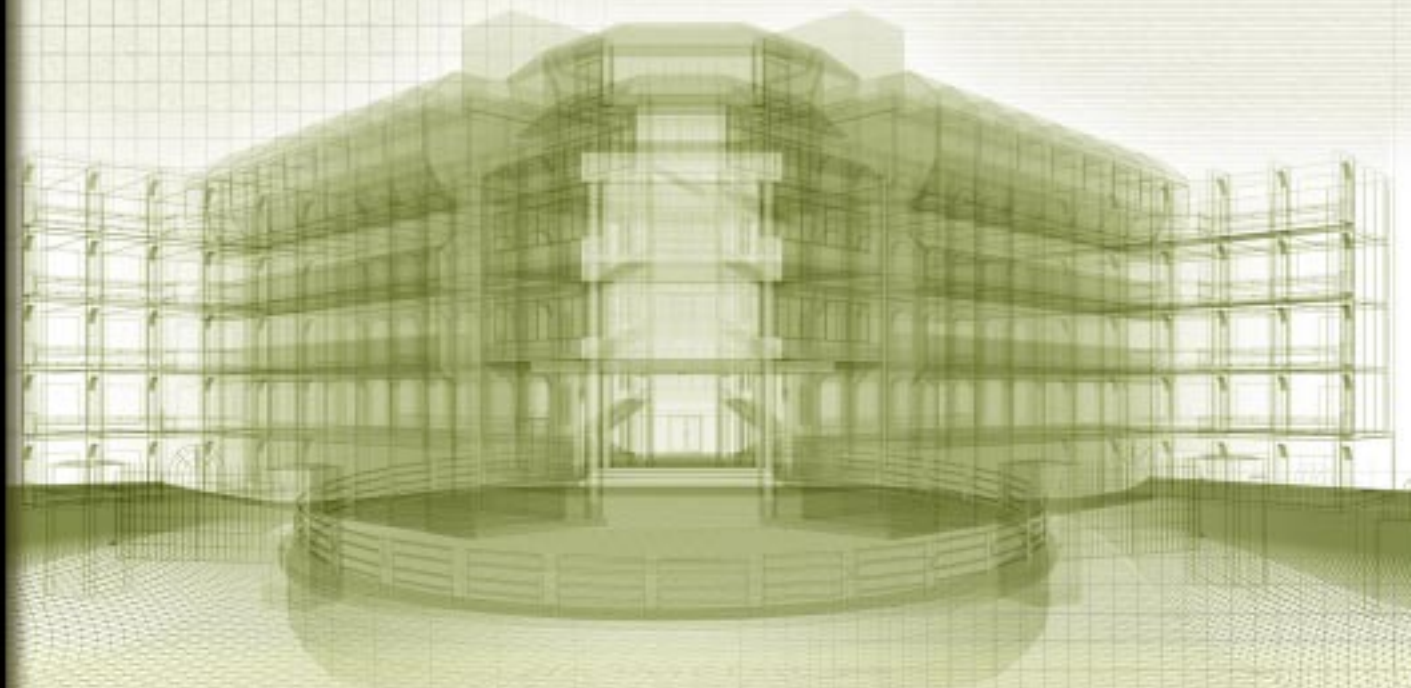
MODEL ENGINEERING COLLEGE



ENGINEERING

COMPUTER

ELECTRONICS

BIOMEDICAL

about the institution

Model Engineering College, Thrikkakara is a premier institute of engineering that has carved a niche for itself in the field of technical education in a very short span of time. Ever since its inception in 1989, by the Government of Kerala under the aegis of the Institute of Human Resource Development for Electronics, IHRDE (now IHRD), the college has made its presence felt in the technical horizon of the state.

In place of traditional courses in Engineering, the college offers specialized courses in Electronics and Biomedical Engineering, Computer Science & Engineering and Electronics and Communication Engineering. Unique in its structure, methods and goals, the college is strongly rooted in a philosophy of training and research that emphasizes the intimate relationships between knowledge and its application and seeks to promote the creation of an ideal society.

The college is situated at Thrikkakara, an idyllic spot in the fringes of Kochi. The location offers an inherent advantage in that it is just a stone's throw away from Aluva, the industrial capital of the state, yet sufficiently distanced from the hustle of Kochi city, providing a congenial atmosphere for diligent academic pursuit.

College has been selected for financial assistance by TEQIP (Technical Education Quality Improvement Programme) a World Bank Project. The college is expected to receive around Rs10 crores under this scheme. An amount of Rs4.3 crores have already been sanctioned. For more details log on to www.npiu.nic.in

The college is affiliated to the Cochin University of Science and Technology, which confers the degree of Bachelor of Technology (B. Tech) in various disciplines.

The college, having close report with reputed organizations like National Physical and Oceanographic Laboratory (Govt. of India), Electronics Research and development centre, Thiruvananthapuram, Vikram Sarabhai Space Centre, Thiruvananthapuram and Sree Chithra Thirunal Institute of Medical Science and Technology, Thiruvananthapuram, has already made significant contribution to the R & D activities in the state.

Nature of Admission

Admission to the institute is based on an All Kerala Engineering Entrance Examination conducted by Commissioner of Entrance Examination, Government of Kerala. Of the half-lakh aspirants, only the elite make it to this institution. The college is rated the second best in the state , after the College of Engineering, Trivandrum.

Courses offered by the Institution

Four year B Tech programme in

- Electronics and Communication Engineering
- Computer Science and Engineering
- Electronics and Biomedical Engineering

Structure Of B-Tech

The B-Tech degree programme offered by this institution is an eight semesters four year spanning course. Each semester consists of five theory papers and two lab sessions. The Cochin University of Science and Technology (CUSAT) conducts examinations at the end of each semester accompanied by continuous internal evaluation. The final three semesters of the course are specifically designed for specialization where the student gets to choose elective subjects. In addition, the students have to present a mini project (6th Semester), a seminar (7th Semester) and a main project which is to be completed during the final year of study. Thus the course trains the students through the basics to specialization in his field of choice.

Projects

Mini Project

A mini project, done during the 6th semester, is intended to provide the students with experience in various areas such as project planning, project design, development and maintenance. Many of the mini projects done by the students of the college have won wide acclaim in National Level Science and Technology Meets.

Seminars

A seminar, to be presented in the seventh semester, on the current cutting edge technologies helps the students to keep in pace with the changing technologies.

Main Project

The duration of the Main Project is one year, where, in the seventh semester the design of the project is to be presented. In the final semester, the project at hand is to be completed as per the project design. The projects done by the students of the college have been often applauded by the technical society of the country.

Other Facilities

Library

A fully computerized library caters to the needs of the students and faculty members. The library has a rich collection of books and periodicals, which mainly focus on Biomedical, Computer and Electronics Engineering.

The library has a collection over 7,000 titles and 14,000 books. A separate section has been arranged for IEEE publications. The library provides information services such as current awareness service, selective dissemination of information service, reference service, bibliographic service etc. An amount of Rs50 lakhs is sanctioned for modernisation of the library under TEQIP Project.

Clubs

The college is home to an array of energetic clubs

Eco-Friends

The MECian nature club strongly believes in the motto of “Green MEC, clean MEC”. Camps are organized regularly at places of ecological interest.

National Service Scheme (NSS)

The National Service Scheme of the college cultivates in the students a spirit of social service. The society conducts regular Blood Donation Camps and has been appreciated by the IMA. Its activities also include social service camps.

Sports Club

The intra-mural sports program includes Football, Volleyball, Basketball, Badminton, Table tennis, Cricket etc.The sports club conducts a sports meet once every year . MEC cricket team is ranked “the best” in Cochin University. We have a well equipped Health Club provided for the students.

Arts Club

It provides a platform for students to develop their creative skills. This club facilitates the students to participate in various arts festivals in the state and country. This club is responsible to organize the annual arts festival in the college .

Extra-Mural Club

Music club, Quiz and Debate club and audio Visual club come under the roof of the Extra-Mural club. It organizes special student surprises for Vishu, Onam, Christmas, New Year etc.

IEEE

IEEE Student Chapter has an active student involvement and is one of the most dynamic associations in the college. The student chapter organizes seminars, exhibitions and all India level events like EXCEL. Talks on state of the art technologies by experts in the fields of Electronics, Computers and Biomedical Engineering, paper presentations, exhibitions, hardware design contests and software design contests are the main attractions of the event.

The Senate

Senate is the supreme student body ,whose members are elected by and from the students with two representatives from each class.

The objective of the senate

- To train the students of the college in their duties, responsibilities and rights
- To promote opportunities for the development of personality, leadership, efficiency, knowledge and spirit of service.
- To organize debates, seminars, group discussion, work squads' tours etc.
- To encourage sports, arts and other cultural social or recreational activities.

The senate is widely accepted in the college for the zeal with which it undertakes various activities.

Alumni

Enriched by students whose individual and professional achievements create an invigorating community, the alumni association keeps silicon threads of attachment between old students and Institution.

Its objectives are

- Keep old students informed of the growth and development of the institution
- Give opportunities to old students to participate in the responsible task of building up and maintaining the MECian tradition
- Help the students graduating from the college in securing employment consistent with their qualifications
- Offer meaningful industrial projects to the students and staff of this college and promote "industry-institution interaction".

Address for Correspondence

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Placement Committee

Chairman	:	Prof Jyothi John, Principal of Model Engg. College Contact no: +919847180024
Placement Officer	:	Mrs. Jayashree V K e-mail : pc@mec.ac.in
Student Coordinators	:	Prince V Thachil Contact no :+919447004239 Bishnu Raveendran Contact no :+919847622174

Electronics & Communication Engineering

The Electronics Engineering Department of Model Engineering College offers premier professional training with an eye on the modern developments in electronics and information technology. It offers a four year undergraduate course in electronics and communication engineering. The department has proved to be unsurpassed within the state and has received accreditation from NBA. Teamed with an excellent infrastructure, competitive faculty and an active students chapter of IEEE, it offers an outstanding opportunity for budding professionals to polish their skills and outperform their competitors.

Departmental mission

To provide a conducive environment that shapes students in to professionals who remain in very high demand in the electronics industry. It prepares the student to meet the challenges of the new information age. It also helps the students in defining a distinct place for them, where even the lines between software and hardware are getting blurred.

Objectives

- To provide a platform for students, to realise, enhance, and polish their skills in the field of electronics and communication.
- To equip the engineers of tomorrow for the fast paced field of communication technology.
- To keep the students aware of latest cutting edge technologies through talks, seminars etc.
- To reinforce into the students, through mini and main projects, their skills to work in a team.
- To establish in the mind of student, an uncompromising commitment to quality.

Salient Features

A syllabus encompassing the latest technologies, excellent lab facilities and an exemplary faculty are the main reasons for the prized status accorded to this course. The curriculum includes apart from core electronics, papers on Communication Engineering, Instrumentation, Signal Processing, Process Control and Industrial Management. A mini project undertaken during the pre final year, exclusive to this college, sharpens the practical prowess to the students.

The necessity for a student of Electronics to keep himself acquainted with cutting edge technologies in the Electronics arena is well understood. The vast library and high speed access to the internet make sure that latest information in the field of Electronics is readily available. Through technical associations such as the student chapter of IEEE, Electronics Association – "Mixed Signals" and the Model Amateur Radio Club (MARC) the department offers ample opportunity for development. Seminars and talks organized by these associations ensure that the students get to interact with experts as well as students from other colleges and thus keep abreast with the latest in the field of technology.

Syllabus

- Fundamentals of Engineering
- Digital Electronics
- Solid State Electronics
- Electronic Circuits
- Communication Engineering 1
- Microelectronics and Linear Integrated Circuits
- Electromagnetic Field theory
- Test and Measuring Instruments
- Industrial and Power Electronics
- Communication Engineering 2
- Communication Theory
- Digital Communication
- Microwave Techniques and Devices
- Digital System Design
- Electronic Product Design and EDA tools
- Object Oriented Programming
- Audio and Video Systems
- VLSI System Design
- Computer Networks
- Modern Communication Systems

Electives

- Digital Image Processing
- Artificial Neural Networks
- Biomedical Instrumentation
- Systems Programming
- Opto Electronics

Labs and Practicals

Circuits (Analog) lab

Basic principles of electronics circuits are assimilated in two sessions (semester 3 and semester 4) of circuits labs.

Circuits (Digital) lab

Students are trained in digital principles, basic IC's and digital system design in this session.

Industrial and Power Electronics lab

The industrial and power electronics lab gives the student opportunities to deal with different types of converters, power controlling schemes etc

Microprocessor lab (8085 and 8086)

Trains the student in basic programming techniques, I/O interfacing and peripherals device interfacing (8253, 8255, 8254, 8251, 8271, ADC, DAC etc).

Communication Systems lab

Includes experiments in communication techniques like AM and FM, pulse modulation and modulation, mixer, filtering etc. Study of PLL, filters, oscillators etc is also done.

Computer Applications lab

Computer lab impacts basic software skills in languages with exposure to DOS, WINDOWS, UNIX and LINUX environment.

Resources at the Electronics Department

Besides basic equipments like the versatile CROs, High frequency signal generators, Programmable power supply, DSO etc.

The labs are facilitated with

- Spectrum analyser
- DSP trainers with filter design software
- Logic analyser
- Various speed drives both AC and DC
- Programmable logic controller
- Computerized multiprocessor control stations
- High speed modems
- Image scanner
- 350 Megahertz analog CROs, 200 Mhz DSO
- Arbitrary wave generators
- Electronic CAD package
- Digitiser
- FPGA development system with related hardware and software
- PIC evaluation board and evaluation kit
- Intel 89C51 developement systems

Projects

All student projects are focused on cutting edge technologies covering fields like microcontroller based systems, digital communication , optoelectronics, robotics, advanced networking, embedded systems, power electronics and signal processing.

Recent Main projects

1. Wavelet Based Pitch Detection Using TMS 320C 6711 DSK

Abstract: An event based pitch detector employing the dyadic wavelet transform is described. The proposed pitch detector is suitable for both low-pitched and high-pitched speakers and s robust to noise. This pitch detector also has the advantage that it is sensitive to even the non-stationary variations in the pitch period. This pitch detector has been proved with example that it is superior in comparison with the classical pitch detector the uses the autocorrelation and the cepstrum methods to estimate the pitch period.

2. Redundancy Mechanism in Industrial Based Control Systems

Abstract: The project aims at the implementation of redundancy mechanism in industrial based control systems. Redundancy refers to the take over of the scanning of input/output cards of failed processor by the preceding processor. In industries RTU are used to scan and process the various field signals.

3. Embedded Internet Interface

Abstract: This device provides existing data acquisition devices a new means of data transfer that is the Internet. The implementation is a UDP/IP/Ethernet using 8051 microcontroller and CS8900A Ethernet transceiver. The device used for demonstration of the interface capability is a simple temperature sensor circuit.

4. N-Tap FIR Filter using VHDL Implemented on XILINX FPGA

Abstract: The project was aimed at designing, coding and implementing an N-tap FIR filter using VHDL. We developed the architecture for a 256-tap FIR filter. The filter is flexible up to 256 tap and extensible thereafter. The programs were entered in VHDL and simulated using the ModelSim tool. The 16-tap digital filter was later synthesized using Leonardo Spectrum. The digital logic family obtained, conformed to the specifications of the Xilinx Virtex II FPGA.

5. FPGA Implementation Of AIC to DSP Processor using VHDL

Abstract: The objective of the project is to implement an AIC which can be connected o lower resolution ADCs and DACs and can be interfaced to the serial port of the DSP processor, thus reducing the net hardware costs. After its functional simulation and synthesis, we proceeded to implement the AIC circuit on the FPGA, XILINX XC 4003 (PC84).

6. OFDM Implementation on ADSP 2181

Abstract: Orthogonal Frequency Division Multiplexing (OFDM) is an efficient digital modulation technique used or alleviating the effects of Intersymbol Interference (ICI). It is increasingly being used for new technologies, like IEEE 408.11 wireless LAN protocol, DSL etc. The basic idea of OFDM is to divide the available spectrum into many narrowband, low data rate carriers, or sub carriers. To obtain high spectral efficiency, the frequency responses of the sub carriers are overlapping and orthogonal, hence the name orthogonal frequency division multiplexing. Each narrow band sub carrier is modulated using QPSK technique. The project implements OFDM using Analog Devices processor ADS2181.

7. Medical Image Compression

Abstract: An enormous amount of data is produced when a 2-D intensity function is sampled and quantized to create a digital image. Image compression addresses the problem of reducing the amount of data required to represent a digital image. Moreover medical images put the constraint that perfect reconstruction should be possible. The underlying basis of compression is the removal of redundant data. In our work we have adopted two different approaches for removing redundant data. Our first approach is an adaptive implementation wavelet based EZWand SPIHT algorithms. In our second approach the contours of every N^{th} contour level is extracted and chain coded to produce a coarse approximation o the original image.

8. Digital Filters for PSLV Instrumentation Telemetry System

Abstract: The Polar Satellite Launch Vehicle (PSLV) uses a decentralized Instrumentation Telemetry system. The system currently employs analog signal conditioning technique for processing the measured flight parameters. The usage of digital filters along with the standard design methods is seen. The filters are implemented using the SHARC EZ-KIT which is based on the ADSP-21061 processor. Various digital filter types implemented and compared with the existing analog filters in the instrumentation telemetry system.

9. Software defined Radio

Abstract: Conventional radios are implemented in full scale hardware platform where as software defined radios emphasize on implementing using software. This makes it stable in any environment and requires only the change of software code. We aim at implementing a software radio capable of receiving AM, FM and SSB signals in the frequecy range of 0-30MHz.

Clubs and Associations

The college is home to an array of energetic clubs and associations.

Electronics association-Mixed signals

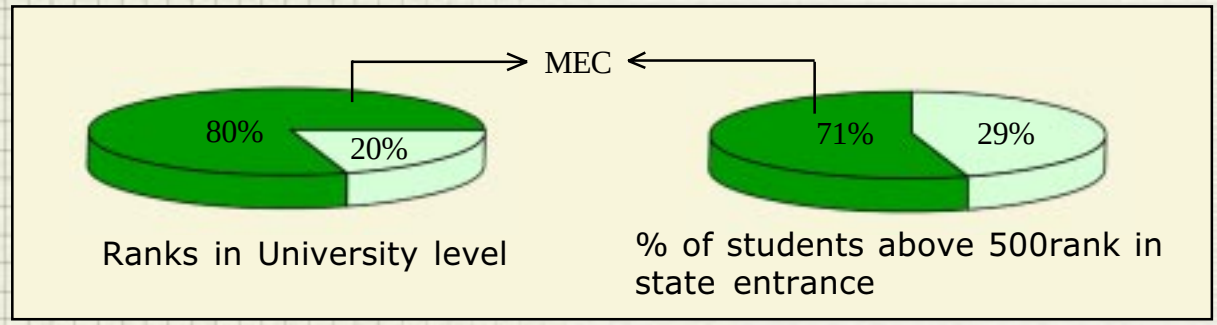
The aim of the association is to provide a platform for exchanging and encouraging skills in electronics field. It conducts various programmes like technical quiz, paper presentation, workshops etc..

Model Amateur Radio Club (MARC)

It organise meetings and various technical programmes for developing the communication engineering skills of the students and for making HAM more popular,not only among the college students but also in the public.

Achievments

- **Prof. T K Mani**, Head of the Department, Electronics and Communication Engineering, won the first prize in the design contest organized by **MicroChip Inc, U.S.A** in 2004. He has also presented a research paper in the 147th meeting of **Acoustical Society of America**. He is also the recipient of **Sir C V Raman award** in 2002 for his paper "The Acoustic of Rain Drop Impact"
- The **Electronics and Communication** Engineering department got accreditation from **National Board of Accreditation**.
- Rupesh Kumar R of 1997 batch won the **Individual Excellence Award** in Infosys.
- Vinitha Suresh of 1993 batch won the **Innovator Asia Award from EDN** Asia Magazine.
- **Niyaz K Zubair** of 2005 batch is a recipient of special **KVPY Award from IISC** Bangalore**.**
- **Alphus Pathrose** of 1997 batch reached the final round of **BBC Mastermind** India Quiz.
- The students have won the top ranks in the university from 1993 onwards.



Computer Science Engineering

The Under Graduate Computer Science and Engineering programme of Model Engineering College is ranked among the best technical programs in the country. The department offers a four year undergraduate course in computer science and engineering leading to the award of Bachelor of Technology from Cochin University of Science and Technology. The program imparts an outstanding educational opportunity for those planning to pursue a career or to gain in-depth knowledge in computing technology and research.

Departmental mission

The foremost objective of the Computer Science and Engineering programme is to hone technical skills demanded by today's engineering professionals by providing a sound technical platform and the required knowledge base. It prepares them to meet the challenges faced by today's IT professional by exposing them to a wide array of cutting-edge technologies.

Objectives

- To provide every student with a strong conceptual understanding in the core areas of Computer Science.
- To enable students to engineer ingenious computing hardware and software solutions with the greatest degree of accuracy, flexibility and based on the latest engineering paradigms
- To familiarize students with the latest in software and programming tools.
- To provide the greatest amount of pragmatism in approaching an engineering solution.
- To provide students with hands-on engineering experience through laboratory courses and projects (Mini and Main).
- To coach students to work in teams and provide insight and direction into the atmosphere as might be encountered by professionals in the field.

Salient Features

The curriculum at Model Engineering College is upgraded on a regular basis to expose students to the new trends in the industry. The four year course is aimed at providing knowledge in both theoretical and practical computer science. It provides specialization in a wide range of hardware and software subjects. The hardware subjects are Computer Network Design, Advanced Computer Architecture, and Parallel Processing etc. The software subjects include Object Oriented Programming, Database management systems, System programming, Network programming, Digital signal processing etc . The curriculum also comprises management papers like Industrial Organization and Management, Reliability and Quality Control . In order to bridge the gap between knowledge and its practical application , students are required to undertake seminars , mini project and a main project , that put them in an industry-like situation .Thus , the course produces an ideal software engineer, well equipped to meet the challenges of the rapidly changing IT industry. Students present a series of seminars on the current technologies in the field during their seventh semester. They also undertake a mini project in their sixth semester and a main project in the eighth semester.

Syllabus

Computer Science Specific Papers

- Computer Fundamentals
- Data Structure and Algorithms
- Data Base Management System
- System Programming
- Discrete Mathematical Structures
- Principles of Programming Languages
- Simulation and Modeling
- Operating Systems
- Compiler Construction
- AI and Expert System
- Computer Graphics
- Formal Language and Automata Theory
- Computer Communication and Networking
- Algorithm Analysis and Design
- Advanced Computer Architecture and Parallel Processing
- Software Engineering
- Object Oriented Modeling and design
- Internet Working
- Distributed Computing

Electives :

- Digital Image Processing
- Artificial Neural Networks
- Simulation and Modeling
- Electronic Commerce
- Software Architecture
- Algorithms and Complexity

Labs and Practicals

Hardware lab

Study of SMPS, graphic adapter cards, floppy disk and hard disk controllers, trouble- shooting and Maintenance. Low level Programming for 8086.

Data structures Lab

The various Data Structures are implemented through JAVA

Compiler construction Lab

Lexical Analysis, writing parsers, Symbol Tables and intermediate code generation using C, LEX and YACC

Network & OS Lab

Exercises involving system calls of a multi tasking operating system, semaphores and monitors, study of TCP/IP , client server programming and internet Programming.

Computer Graphics Lab

Programming assignments on Transformations, Polygon filling, Hidden surface elimination, Shading and illumination models

Lab Facilities

MEC has excellent infrastructural facilities and well maintained laboratories.

Salient Features

- The Computer Science department is provided with 2 Software Development lab networked entirely and connected to Internet via a 64kbps RF link to VSNL, providing us with 24 hr internet connectivity.
- There are 150 computers with varying processing powers from 500hz to 2.5GHz running Linux and Windows and 1 Sun Ultra Spark Server running Solaris OS.
- Thin clients based on Linux Terminal Server Project(LTSP) with both Pentium based PCs and sparc based java boxes as clients.
- Small Beowulf cluster and a few of our lab computers run open mosix clustering.
- Implementation of Grid computing in our lab.
- Connected to VSNL with a 64kbps RF link which provides our college with 24 hours internet connectivity to the students and staff.
- We Host our own Web Server, FTP Server and Mail Server powered by debian. Our Lab is equipped with a SGI workstation, a raid array, an apple pc and a GPS which is a part of our GIS lab.

Programming Exposure

Advanced Computing Lab

Computer network of the advanced computing lab supports IPv4 and IPv6.The heterogeneous network has systems within experimental project for network monitoring and maintenance with intelligent networks

Students developed “Srishti” , the award winning high performance cluster computing nodes in-house. The college connects to the internet through leased lines.

Microprocessor lab

The lab is equipped with 8085 and 8086 based system design kits, universal microprocessor kits, EPROM programmers, in-circuit emulators (8086/88),data acquisition cards, logic state analyzers , emulation kits, microcontroller kits etc.

Computer Hardware Lab

Equipped with 80386/486/P II based systems, Add-on cards, PC diagnostic aids, serial cards, sound blaster cards , DSP kits, PC trainer , IDE & SCSI cards and several prototype motherboards.

Coming Up

The first ever Wi-Fi lab in the State with high end Systems

Achievements

The Dept of Computer Science and Engineering of Model Engineering College, is proud to receive all the top three ranks of **CUSAT in year 2003**.

At the national level, the students of this department have come out with flying colors in **GATE** with the best ranks being 32 this year and 56 last year.

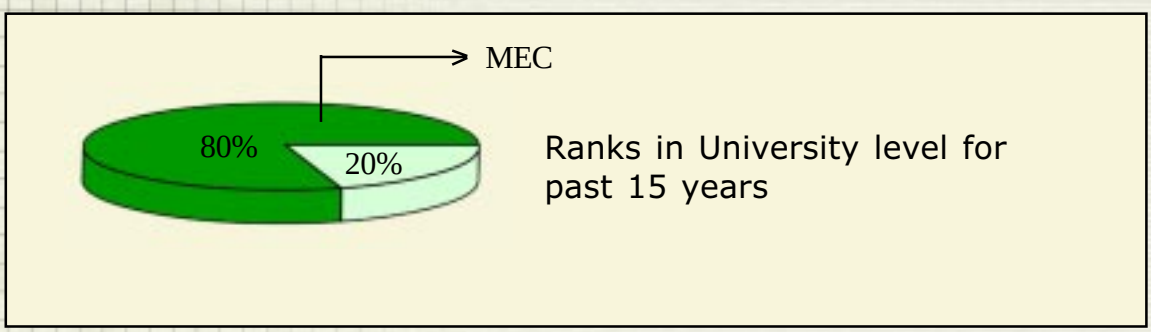
Roshan James and **Pooja Malpani**, of 2002 Batch, currently working with a leading software firm in India have bagged the **Microsoft’s Most Valuable Professional Award** in 2003.

Mithun Koshy Alexander, of 1999 Batch, is currently the **International Student Ambassador in Australian University**.

Deepak Dutt, of 1998 Batch, has won the “**Quality Award of Excellence**” from **Nortel Networks** CEO, Frank Dunn. The purpose of the Award is recognizing employees who demonstrate behaviors that drive our Core Value of “Quality is in every aspect.” and whose innovations deliver clear customer value. The Award emphasizes proactive initiatives intended to incorporate Quality at the beginning of any process, thereby preventing quality-based issues that could degrade the overall customer experience with Nortel Networks. The Award is also intended to facilitate the sharing of best-in-class Quality practices across the company.

Preethish M. Kumar, of 2000 Batch, **Filed 3 patents on Image Processing**. The details are” Optimized Region Growing Algorithm for Scale Space Analysis 16IN-X0230", “Fast Anisotropic Diffusion Filter for Detecting Image Feature in Low SNR Medical Images 16IN-M0245” and “Fast Morphological Linear Granulometric method for finding Global and Local signatures of Medical Images 16IN-C0158”.

Our academic record over the past 15 years reflect the quality of the Computer Science students coming out of the college each yearyear .Throughout its lifetime the Dept. was successful enough to produce rank holders year after year, shining out the name of the institution.



Sponsored Research Programs

A team of Students led by the our HOD Prof. Jyothi John is currently working on a Sponsored Research Project titled "Porting of Ocean Channel Modeled to Parallel Environment" at a cost of rupees 5 Lacs for NPOL, Ministry of Defence, Govt. of India

Projects

1) Optimizing C compiler for .NET

Ajith Kumar R, Mahesh Sharma H, Praveen PP, Sreejith S, Vijay Venoo Thampi

The aim of the project is to implement a reasonable and retargetable optimizing compiler. This compiler is meant to be used along with the "ROTOR" framework and will provide for a C compiler that outputs MSIL (Microsoft Intermediate Language). The compiler may also be extended for example to produce a tool to generate native compiled executable for Java Source code.

2) BIOCLUSTERS- Role of Cluster Computing in Bioinformatics

Anish Abraham, Deepak A K, Arun M, Johnson Joseph, Bobish Dan Abraham

In the project, we look into the prospects of parallelising two major applications in bioinformatics on Beowulf clusters. These applications are chosen to be representatives of two problems groups that involve performing either large number of non computer intensive tasks (eg: performing BLAST searches in database) or, a single task requiring huge computational power (eg: Protein folding simulation. Two of its applications are:

1. Scalar & Parallel versions of flexible local alignment
2. Scalar & Parallel versions of protein folding simulation

In addition, a facility to perform standard BLAST searches in a genome database in parallel on the nodes of a Beowulf cluster was setup.

3) 32 Bit Operating System

Anoop M S, Judy Jospeh, Manoj Victor Mathew, Rajesh Mathew, Vimal Mathew

The project is an attempt to build a 32 bit protected mode operating system. An Operating System is necessary component for every computer system. It acts as a mediator between the user and the system. It is responsible for allocation of resources and their proper usage. The components of the Operating System are memory management, I/O Management, file system, process management and interface for application programs. Our Operating System is based on the UNIX Kernel architecture.

4) High Performance Cluster Computing—"SRISHTI"

Ciji Isen, Deepu Prakash, Sherin Sebastian, Thommen Korah, Yusuf Rejo

It aims to demonstrate clusters as a viable alternative to MPPS (Massively Parallel Processors). It explorers alternatives to TCP/IP in the form of GAMMA allowing a drastic reduction in network latency by eliminating a lot of the protocol overhead. It provides the basic framework for development of parallel programs based on message passing architecture. The ease of application development on the cluster is further enhanced by the indigenous Object Oriented Master Slave Library, MSLIB.

5) a. Spam Filtering Using Spam Mail Communities

Deepak Balasubramanyam

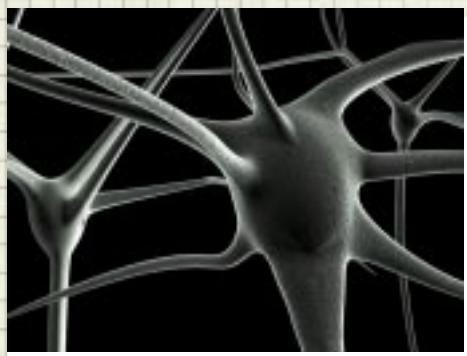
This project describes an approach towards spam filtering that seeks to exploit the nature of spam messages that allow them to be classified into different communities. The new approach does not base itself on any prejudices about spam and can be used to block non-spam nuisance mails also. It can also support users who would want selective blocking of spam mails based on their interests. The approach inherently is user-centric, flexible and user-friendly.

b. Specialization Scores For Assymetric Web Search Queries

This is an approach to compute the specialization score for search queries, the aim of the score being to indicate how specialized the narrow topic is, to the broader topic. The approach generates scores for such queries, which can further be used to refine web searches for such queries, provided a given query could be identified to be of the form that we deal with.

c. Context Disambiguation in Web Search Results

Web searches results in many pages that are not of interest, these may be due to a word or words in the search query having different contexts, the user obviously expecting to find pages related to the context of interest. This work proposes a method for disambiguating contexts in web search results.



Electronics & Biomedical Engineering

Model engineering college is one of the premier technical institutes in the country which offers Electronics and Biomedical Engineering course at graduate level. The course offered here is accredited by the National Board of Accreditation, NBA. The course is often confused with Biotechnology, which is a totally wrong notion. Here, the syllabus is structured in such a way that, emphasis is laid on electronics and instrumentation, coupled with developing expertise in the biomedical field. An excellent, well informed and committed faculty along with the best facilities like the ultra modern labs, mould the students into fine engineers. The college is the only one of its kind to get accreditation for this B.Tech course at the national level. Being a dynamic combination of two emerging fields, this course has the broad objective of providing assistance in the struggle against illnesses and diseases by developing tools and techniques for research, diagnosis and treatment.

Departmental mission

The mission of the Biomedical Engineering program is to create, integrate, transfer and apply knowledge of engineering design and problem solving through the development of professionals and leaders by uniting engineering and health sciences faculty and counterparts in the community and create new medical devices, solve clinical problems, and promote collaboration with industry.

Objectives

- To teach students how to analyse and implement practical solutions for complex interdisciplinary engineering problems.
- To give students a strong foundation for post graduate studies in the field of Electronics and biomedical engineering, biometrics, bioinformatics, and related disciplines.
- To teach students how to use state-of-the-art software tools to solve biomedical and electrical engineering problems.
- To provide students with hands-on engineering experience through laboratory courses and opportunities in industry and government laboratories.
- To cultivate the ability of the students to communicate and work effectively in teams.

Salient Features

Electronics and Biomedical Engineering programme of the college gives thrust to electronics, computing, signal processing applications along with medical instrumentation, spectrum photometry, photonics, medical imaging and medical informatics. Selected topics within the general areas of instrumentation, electronic devices, biomaterials, biomechanics, biosensors and transducers, graphics and volume visualisations, system physiology and clinical engineering are also covered in the course. The course also offers specialization in advanced imaging techniques, laser instrumentation, and digital image processing and neural networks.

In addition to the Electronics and Instrumentation subjects, computing subjects such as Microprocessor, Microprocessor Systems Design and Principles of Programming in C/ C+ + and JAVA are incorporated in the syllabus. Practical sessions in C/C + + programming and Microprocessor (8085 and 8086) programming are also provided to enhance programming capabilities.

Syllabus

The syllabus of the course can be broadly classified as follows

- Digital Electronics
- Solid State Electronics
- Electronic Circuits
- Communication Techniques
- Microelectronics & Integrated Circuits
- Industrial and Power Electronics
- Hospital Engineering
- Biosensors and Transducers
- Analytic and Diagnostic Equipment
- Medical Imaging Techniques
- Therapeutic Equipments
- Principles of Radio Diagnostic and Therapy
- Object Oriented Programming
- Computer Networks
- Modern Medical Instrumentation
- Modelling of Physiological Systems
- Biophysics
- Biomechanics
- Biomaterials

The electives offered for the course includes

- Digital Image Processing
- Artificial Neural Networks
- Biomedical Laser instrumentation
- System programming
- Medical Electronics and Experts Systems
- Graphic and Volume Visualisations

Labs and Practical

Basic Electronics Lab
The lab emphasizes on the basics of electronic components and circuits. They involve rectifiers, various transistor configurations, characteristics of other active elements, integrator, differentiator, clipping and clamping circuits, filter circuits…

Electronic circuits lab
Transistor biasing circuits, amplifiers, sweep circuits, op-amp configurations, oscillator circuits, multivibrators, integrators and differentiators, voltage regulators.

Digital Electronics Lab
This involves study of basic digital gates, combinational circuits, multiplexers, flip flops, shift registers, counters, TTL and CMOS, timers, multivibrators…

Medical Electronics Lab I
Pace maker circuits, LDR circuits, thermistors, DAC/ ADC, Instrumentation amplifier, Analog multiplexer, frequency meters.

Medical Electronics Lab II
PLL, frequency and amplitude modulators and demodulators, ECG simulators, sample and hold circuits, Voltage to frequency converters, power control using SCR, regulator ICs, transducers and Isolation circuits.

Bioengineering Lab
Flash ADC, ultrasound scanner, X-ray timer, ESU waveform generator, chart drive circuit, power amplifier.

Medical Systems Lab
Fixed power supply, variable powers supply, colorimeter, EEG recorder, defibrillator, ESU, electrocardiograph…

Catheterization Lab

Lab Facilities

MEC has excellent infrastructural facilities and well maintained laboratories.

The Biomedical Department shares some labs with Electronics Department. Apart from this the department has three well maintained labs and adequate equipments.

Besides basic equipments like the versatile CROs, high frequency signal generators, SMPS, etc., the labs are facilitated with:
Biplane Catheterization Lab Facility
Image Processing Systems including a Frame Grabber Unit with CCD Camera and its software, Blood Gas Analyzer, Colorimeter, Hb meter, pH meter, Flame Photometer
Therapeutic Equipments such as EEG, ECG, Student Physiograph, Electronic BP meter, Pulse Oximeter, Computerized Cardiac Stress Testing Unit,
Foetal Heart Monitor, FEM Software Package NISA III

Projects

1. Low Cost Solution To Gait Cycle Digitization

Anil T George, Anoop Kumar K, Binoy P K, Betsy Louis, Mithun T K, Reuban K Sam

Analysis of human gait cycle using specially developed potentiometric sensors at the ankle, knee and hip to measure angular displacement of land marks. Angular displacements are calibrated in terms of voltage and these voltage signals are applied to the parallel input port of a compute. Gait analysis is a valuable tool in diagnosing walking disorders.

2. Volume Visualization in Medical Imaging

Jessy Varghese, Elizabeth Jyothi, Ellima Sugunan, Rincy K Mathew, Rosa M M, Smitha K S

It's a volume visualization system that provides a comprehensive 3-D image with several 2-D cross sectional slices given as inputs. The cross sectional images obtained from CT or MRI can be interpreted for diagnostic purposes.

3. Wavelet Analysis of ECG

It provides a better description of EEG signals. In this system time frequency representation has been used. Wavelet transforms have time frequency capabilities. Further they provide multilead analysis of the signal.

4. Microcontroller Based Speech Synthesizer

Abdul Jaleel V M, Abdul Muneer K P, Harikrishnan Varma, Yasir R C

It is a compact speaking machine that is capable of speaking anything. Input is given using a conventional keyboard. It adopts a simple text to speech technique.

5. Computerized Treadmill for Cardiac Stress Testing

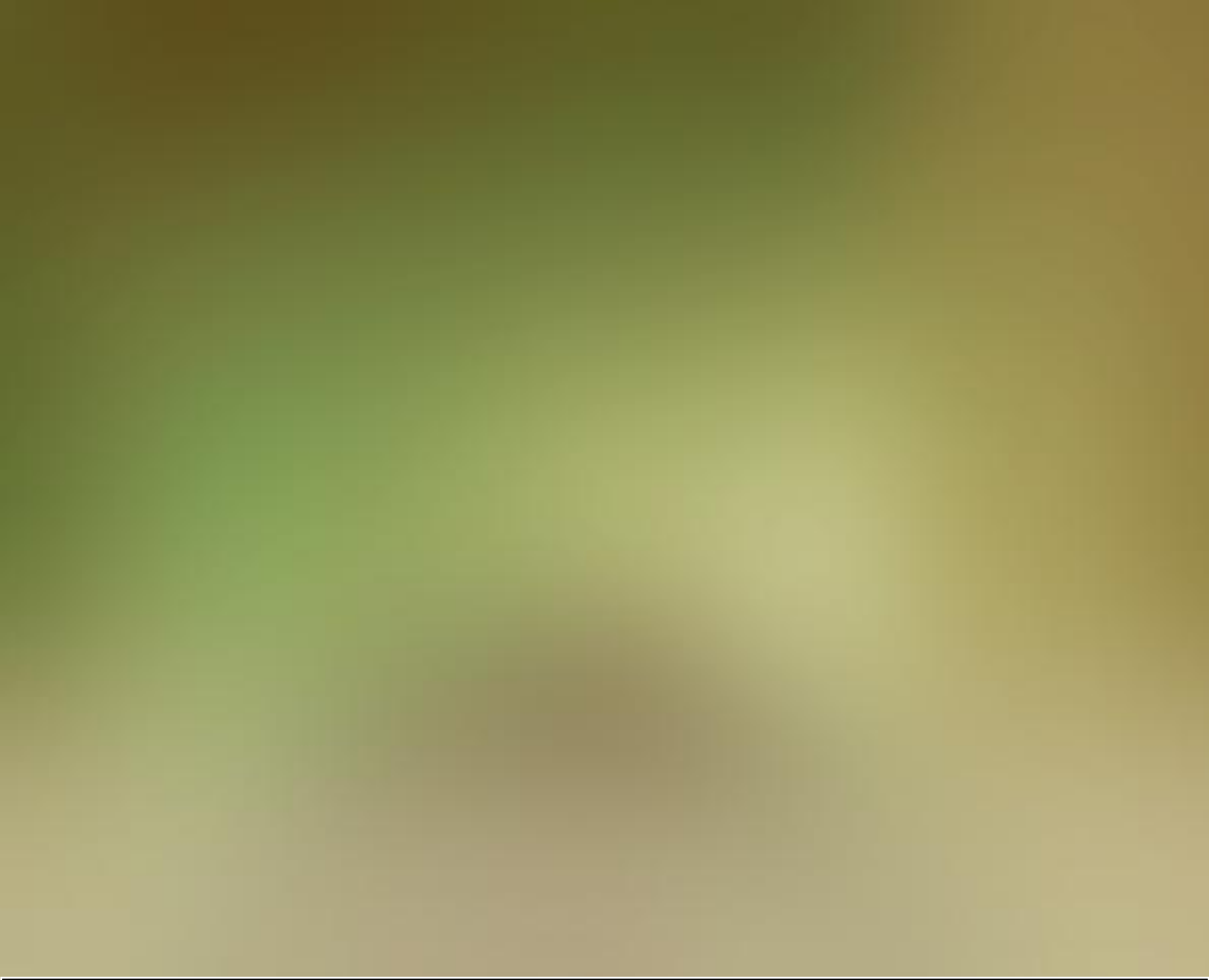
Ashwini Vasanth Dev, Eldos P Kuriakose, Lakshmi Chandran B, Pradeep Kumar

The project aims at computerizing the treadmill and acquiring ECG from the exercising patient. The treadmill parameters speed and elevation can be varied as per standard exercise protocols and along with ECG. These parameters are displayed in a friendly graphical interface.

...in the INDUSTRY

....YES, we are there too...

- intel
- DELL
- Texas Instruments
- Toshiba
- Motorola
- Kanbay
- Cisco
- Bosch
- Johnson & Johnson
- Erricson
- Analog Devices
- Philips
- Novell
- Lucent
- Honeywell
- IBM
- Avenir technologies
- Oracle
- Hewlett Packard
- Microsoft
- Verizon
- Itium
- TCS
- CTS
- Infosys
- Siemens
- Tata elxsi
- L&T
- L&T emsys
- Wipro
- Accenture
- Mindtree
- Reliance
- Sasken
- Satyam
- Tata Infotech
- HCL
- Mascot
- Hughes
- SAP
- GE
- Huavei
- Inautix
- ABN Amro
- EDS



SYLLABUS

Model Engineering College

how to get here ?

Model Engineering College

learnin g and innovation

unique in structure, methods and goals,
we believe in a philosophy
of training and research
that emphasises the intimate relationship
between knowledge and its application,
between college and the community
and seeks to promote

the creation of a better society...

our vision

designed by the students of model engineering college

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