

### Vision

To produce higher caliber Biotechnologists to attain new heights in bioinformatics and bioprocess technology as per industrial needs and to provide leaders in the field of Biotechnology.

### **Mission**

- To progress the department to attain center of excellence in bioinformatics and bioprocess technologies by providing best Undergraduate, Postgraduate, Doctoral programs and R&D activities within a decade.
- To develop special skilled training programs for graduates to meet the personality characters stipulated by the industries within a period of five years.
- To build potential biotechnologists capable of dealing with new challenges and socioethical implications.

### B. Tech. Biotechnology

### **Program Educational Objectives**

- **PEO-1**. To produce Biotechnology graduates who will be employable in core Biotech/Pharma industries and domain-based software services.
- **PEO-2**. To produce research-oriented Biotechnology graduates who will be employable in academic/Industry sponsored research and also who will be pursuing higher studies.
- **PEO-3**. To produce bioentrepreneurs.

### **Program Outcomes**

- **PO-1**. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- **PO-2**. **Problem Analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO-3**. **Design / Development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO-4. Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

- **PO-5**. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO-6**. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO-7**. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO-8**. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO-9**. **Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO-10**. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO-11.Project management and finance**: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO-12.Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

### **Program Specific Outcomes (PSOs)**

- **PSO-1**: To make the students understand and apply the knowledge of computational systems biotechnology to design and develop biologics to meet societal needs.
- **PSO-2**: To train the students to meet the requirement of bioprocess industries for developing techno-economical processes.
- **PSO-3**: To empower the students with competent skill sets for bridging the gap between academia and the requirements of the healthcare industry.

### M. Tech. Biotechnology

### **Program Educational Objectives**

- **PEO-1**: To prepare the students to excel and succeed in biotechnology research or industry through the latest state-of-art postgraduate education.
- **PEO-2**: To train students with good scientific and technical knowledge so as to comprehend, analyze, design and adopt innovative and new technology that provides solutions for developing novel biotechnological products.
- **PEO-3**: To create bioentrepreneurs with good communication and leadership skills, respect for authority and the life-long learning needed for a successful professional career.

### **Program Outcomes**

- **PO-1**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- **PO-2**: An ability to write and present a substantial technical report/document.
- **PO-3**: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- **PO-4**: Ability to examine the technological problems in various domains of Biotechnology apply modern engineering tools for the prediction and modeling of complex engineering problems with a focus on sustainable development.
- **PO-5**: Students should be able to acquire self-management and teamwork skills to collaborate with multidisciplinary teams from academic, industry and research institutes of national or international repute, with a commitment to lifelong learning.
- **PO-6**: Potential to apply biotechnological solutions by adhering to the standards of bioethics with social responsibilities.

### **Program Specific Outcomes (PSOs)**

After the successful completion of M.Tech. Biotechnology program, the students will be able to:

- **PSO-1**: Demonstrate the biotechnology concepts and research approach and apply them for healthcare and industrial applications.
- **PSO-2**: Possess scientific and technological skills to design and develop novel bioproducts for addressing biological and healthcare challenges.
- **PSO-3**: Analyze the socio-economical needs and possess the necessary expertise to become a bioentrepreneur.

### **Prof. M Sivanandham's visit to Abroad Universities**

The Department of Biotechnology of Sri Venkateswara College of Engineering is pleased to announce that our esteemed Secretary and Visiting Professor of Biotechnology, Prof. M Sivanandham, recently visited the Illinois Institute of Technology in Chicago, Illinois, USA. The purpose of this visit was to explore potential avenues for collaboration between the two institutions.



During his visit, Prof. Sivanandham had the opportunity to engage with several notable individuals, including Dr. Vanita, Director of International Programs, Tanya, Associate Chair of Biology, Dr. Janiffer, Dean of the Lewis College of Science, and Dr. James, Chairman of the Department of Electrical and Computer Science. Discussions were held regarding areas of mutual interest and potential benefits for both institutions.

Also, Prof. M Sivanandham recently visited the University of Illinois, Rockford, USA with the aim of exploring potential avenues for collaboration between the University of Illinois, Rockford and the Department of Biotechnology, SVCE. During his visit, he had the opportunity to interact with our alumni students and the Professors of UI, Rockford, and discussed potential areas of mutual interest and benefit. The visit was fruitful, and we eagerly look forward to strengthening the collaboration between institutions in the future.



### **Events Organized**

### National Level Technical Symposium - OMICS 23

OMICS, an annual student technical symposium was organized by the Students' Biotech Forum (SBF) and Department of Biotechnology, Sri Venkateswara College of Engineering on 3<sup>rd</sup> April 2023. This symposium was designed to provide a platform for students to showcase their skills, knowledge, and creativity in the field of biotechnology and to network with experts in the field and gain valuable insights into the latest developments in biotechnology. OMICS offered a range of events for students' participation. The main events included are paper presentation, poster presentation, Ideathon, and model making. The paper presentation event allowed students to present their research work and findings to a panel of experts in the field. The poster presentation event gave students the opportunity to create a visual representation of their research work and present it to the audience. The Ideathon event challenges students to come up with innovative ideas and solutions to problems in the field of biotechnology. The model making event involved students creating physical models of their ideas and presenting them to the judges.

The event was inaugurated by the Chief Guest, Dr. Aadarsh Narendra Dev, Head-R&D, Tex Biosciences Pvt. Ltd., Chennai in the presence of the Guest of Honor, Ms. K. Mohanpriya, Manager-HR, Tex Biosciences Pvt. Ltd., Chennai.

The Valedictory Address was provided by Prof. C. Muraleedharan, Chief Placement Officer, Sri Venkateswara College of Engineering.

Students from Sri Venkateswara College of Engineering, Vel Tech High Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Karpaga Vinayaga College of Engineering and Technology, Arunai Engineering College, Rajalakshmi Engineering College, SRM Institute of Science and Technology, Prathyusha Engineering College and Sri Sairam Engineering College registered for the various events.

OMICS provided numerous benefits to students, which included the enhancement of academic and professional skills, confidence, and self-esteem.

The events are listed as follows,

Events	<b>Number of Students</b>
Paper Presentation	47
Poster Presentation	25
Ideathon	42
Model Making	36
Bio Doodlez	77
Bio Hazard	24
Bio Plague	21
Bio Art	17



Inaugural address by the Chief Guest, Dr. Aadarsh Narendra Dev, Head-R&D, Tex Biosciences Pvt. Ltd., Chennai.



Release of OMICS magazine.



Valedictory address by the Chief Guest, Prof. C. Muraleedharan, Chief Placement Office, SVCE.



Mr. Sriram M and Mr. Girish from  $2^{nd}$  Year B. Tech Biotechnology received  $2^{nd}$  Prize in the poster presentation.



Varsha G, Tharangkini S and Swalakshana A S from 2<sup>nd</sup> Year B.Tech Biotechnology received 1<sup>st</sup> Prize in model making.



Mageshwari R, Shruthi. V and R. Reshma from 1<sup>st</sup> Year B.Tech Biotechnology received 1<sup>st</sup> Prize in Biodoodlez Event.

Shrihari J from 1st Year B.Tech Biotechnology received 1st Prize in Biohazard Event.



Mr. Sriram M, Mr. Girish and Mr. Sivagurunathan R from  $2^{nd}$  Year B.Tech Biotechnology received  $1^{st}$  Prize in the Bioplague Event.

### **Guest Lecture**

A guest lecture on "DNA Sequencing" 24th April 2023



Dr. Stefan Thalhammer, Founder and CSO, Senray, Technologies, Munich Germany

The Department of Biotechnology of Sri Venkateswara College of Engineering organized a Guest Lecture on "DNA Sequencing" featuring Dr. Stefan Thalhammer, Founder and CSO of Senray Technologies, Munich, Germanyon April 24<sup>th</sup> 2023 from 01:30 PM to 02:30 PM (IST)





### Consultancy







Dr. K. Ganesh Prasath

Prof. E. Nakkeeran, Head of the Department and Dr. K. Ganesh Prasath, Assistant Professor, Department of Biotechnology have completed a consultancy work from M/s. L&T Water Technology Centre Campus, Neervallur Village, Kanchipuram and performed the Microbiological analysis of STP untreated and treated water and potable water.

### Ph.D. Viva-Voce



Mr. Aswin Jeno J.G. Assistant Professor

Mr. Aswin Jeno J.G., Assistant Professor, Department of Biotechnology, defended his Doctor of Philosophy Viva-Voce entitled "Green Synthesis of Improved Niosomal Formulation with Indian Herb oils against Arthropod pests" under the supervision of Prof. E. Nakkeeran, Department of Biotechnology on 26<sup>th</sup> April 2023, at Biotech Conference Hall, Department of Biotechnology, Sri Venkateswara College of Engineering, Sriperumbudur.

### **Placement Update**

The core and information technology companies began the campus drive for the B. Tech Biotechnology students of 2020-2024 Batch.



Ms. Aparrajitha V (2020-2024 Batch)

• Placed in M/s. Facilio Technology Solutions Pvt. Ltd, for Non-Technical Role with CTC of 5 Lakhs PA.

## **Higher Studies Update**

MS Biotechnology at Northeastern University, Boston, USA

### **Post-Graduate Admissions Abroad**





Ms. Sarvika P M (2019-2023 Batch)

# COMMON ENGINEERING ENTRANCE TEST & ADMISSIONS (CEETA-PG 2023) Lakshmi B, IV Year 99.01 % Rajashree R, IV Year 96.59 % Shalini A, IV Year 82.39 % Mayuri S, IV Year 80.02 %

### **Research Activities**

### **Publication of Research Article**



Mr. J. Hariharan Assistant Professor



Mr. S. Nagavignesh Assistant Professor



# Penta Cancer Detection Using Deep Learning Technique

T. Sukumar 🗹, V. Vidhya, S. Aiswarya, S. Nagavignesh & J. Hariharan

Conference paper | First Online: 08 April 2023

### Abstract

Cancer is the result of unregulated cell division caused by genetic flaws. Initial diagnosis and primary causes of death are difficult due to its complexity. Cancers such as skin cancer, lung cancer, breast cancer, prostate cancer, and brain cancer kill people all over the world. Traditionally, a biopsy is used to diagnose cancer. This method of manually interpreting medical photographs takes a long time and is prone to errors. Deep learning algorithms are employed in this study to classify several types of cancer, such as lung cancer, brain tumours, cervical cancer, thyroid cancer, and skin cancer and detect their presence without the need for multiple medical consultations. Each step is carried out using different modules such as data set collection, data set augmentation, data set pre-processing, training with architecture, web application development, and cancer prediction. There are numerous techniques that are available to predict the particular cancer type. The proposed work leads to earlier prediction of the presence of five types of diseases and allows us to take prior actions immediately to avoid further consequences effectively and cheaply avoiding human error rate.

### Keywords

Cancer Deep learning ResNet Tumour VGG19

### **Student/ Faculty Achievements**

### Registration for the iGEM competition 2023

The iGEM competition is a global synthetic biology competition designed for undergraduate university students, high school students, entrepreneurs, community laboratories, and 'overgraduates'. The primary objectives of iGEM are to facilitate the systematic engineering of biology, promote the transparent and open development of biological engineering tools, and foster the construction of a society that can safely and productively apply biological technology.

With the tireless efforts of **Prof. E. Nakkeeran, Dr. K. Divakar, Mr. J. Hariharan**, and all the members of the iGEM team, Department of Biotechnology, has successfully registered for the iGEM competition 2023.



### **ISTE Best Student Award**



The Department of Biotechnology at Sri Venkateswara College of Engineering extends its sincere congratulations to Mr. Sakthivel Subramaniam, our third-year student, for receiving the ISTE Best Student Award for the year 2023 from the Indian Society for Technical Education. This esteemed award is presented to students who demonstrate exceptional performance in academics, extracurricular and co-curricular activities, as well as active participation in ISTE Chapter activities. We take great pride in Mr. Shaktivel's achievement and extend our best wishes for his future endeavors.

# **Guest Lecture Given by the Faculty**



**Prof. E. Nakkeeran**, Head of the Department has presented in an invited lecture entitled "Identification of the Strengths and weakness of the institution with gap analysis for Remedial Actions (SWOT Analysis)" at SMF Fomra College of Engineering, Chennai on 11<sup>th</sup> April 2023.

➤ Prof. P.K. Praveen Kumar has received the Doctoral committee Member order for a Ph.D. Student (Mr. R. Hemachandran) from Anna University dated 20<sup>th</sup> April 2023.

### **Awards at Conferences and Tech Fest**

- ➤ Ms. Ananya R C, Ms. Kirtana S, and Ms. Lavanya J of B. Tech Biotechnology batch 2020-24 presented a poster on the topic "Real-time monitoring and controlling device for hypoglycemia in elderly personnel" under the guidance of **Dr. Vasanthraj. K**, and secured the first position in the two-day national level conference BIODRASILLENCE VT'23, on 27<sup>th</sup> 28<sup>th</sup> April 2023 at Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College.
- ➤ Ms. Abinaya T and Mr. Arun Pravin CV of B. Tech Biotechnology batch 2021-25 secured First place and cash price Rs. 500 in the idea presentation event, BIOTIKOS, SAMHITHA 2023 for the paper titled "Microbial method of removal of Microplastic and Heavy metals from water bodies using biofilm" on 8<sup>th</sup> April 2023, at SASTRA University.
- ➤ Ms. Hemapriya S K of B.Tech Biotechnology batch 2021-25 secured First place in the Poster presentation event, BIOTIKOS, SAMHITHA 2023 for the paper titled "Bioprocessing of a municipal waste handy biocomposter at a doorstep" on 8<sup>th</sup> April 2023, at SASTRA University.
- ▶ Mr. Nandakishor V, Mr. Srihari Prasath R, Mr. Harrish S A of B.Tech Biotechnology batch 2021-25 secured Second place in the idea presentation event, BIOTIKOS, SAMHITHA 2023 for the paper titled "Water Hyacinth Bio Briquettes" on 8<sup>th</sup> April 2023, at SASTRA University.
- ➤ Ms. Anushya N and Ms. Parinitha S secured second place in Idea competition of Two-day national level conference BIODRASILLENC E VT'23, on 27<sup>th</sup> 28<sup>th</sup> April 2023 at Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College.

### **Poster Presented**

**Ms. Akshara B S** of B. Tech Biotechnology Batch 2020-24 presented a poster on the topic "Bioremediation using phycopods" at the National Conference on "Sustainable Technologies in Chemical-Biological Systems" conducted by Arunai Engineering College, Tiruvannamalai, Tamilnadu from 5<sup>th</sup> - 6<sup>th</sup> April 2023.

Ms. Dhakshni S S, Ms. Kamali S, and Kimaya G of B. Tech Biotechnology batch 2020-24 presented a poster on the topic "Chitosan derived hydrogels as biodegradable anthroposols to increase soil water retentivity for land reclamation" in the technical symposium PANSOPHY '23 organized by the department of chemical engineering; Sri Venkateswara College of Engineering held on 3<sup>rd</sup> April 2023.

Ms. Magdalene P of B. Tech Biotechnology, batch 2020-24 presented a paper on the topic "Prioritisation of candidate genes for type I diabetes from integrated GWAS using integrated network and pathway analysis" conducted as a part of Biotechcellence'23, organized by the Department of Biotechnology, Alagappa College of Technology, Anna University from 24<sup>th</sup> to 26<sup>th</sup> April 2023.

### Workshop

**Ms. Akshara B S** of B. Tech Biotechnology batch 2020-24 attended a workshop on "BIOINFORMATICS" conducted as a part of Biotechcellence'23, organized by the Department of Biotechnology, Alagappa College of Technology, Anna University from 24<sup>th</sup> to 26<sup>th</sup> April 2023.

**Mr. Jeya Prasath R** of B. Tech Biotechnology batch 2020-24 attended a workshop on "AMYLOGRAPH" conducted as a part of Biotechcellence'23, organized by the Department of Biotechnology, Alagappa College of Technology, Anna University from 24<sup>th</sup> to 26<sup>th</sup> April 2023.

### **Industry Visit Organized**

B. Tech Biotechnology (2019-23 Batch)

M. Tech Biotechnology (2021-23 Batch)



Industrial Visit was arranged for the IV Year B. Tech Biotechnology and II Year M. Tech Biotechnology along with Prof. P. K. Praveen Kumar on 13<sup>th</sup> April 2023 at **Bioscience research foundation in Kandamangalam, situated near Sriperumpudur, Chennai, Tamil Nadu, India**. The BRF industry focused on five main categories including Agrochemicals, Pharmaceutical products, Veterinary drugs, Industrial Chemicals, and Food and feed additives.

### **Alumni Write-up**



I'm grateful that I'm part of the SVCE. Here, I was provided with all the Resources starting with good academic coaching with experienced faculties, laboratories, clubs and societies across SVCE gave me the exposure to its fullest. This kind of exposure really helped me to learn, explore, and to survive inside and outside of SVCE.

Mr. Arun Prakash P (UG 2018-2022) Software Developer, M/s FreightBro Logistics Private Limited,

### **Upcoming Events**



# Sri Venkateswara College of Engineering S∜CE

(Autonomous - Affiliated to Anna University), Sriperumbudur Tk - 602 117, Tamilnadu, India



### SCHOLARSHIPS

- PG scholarship of Rs. 50,000/year for 30% of the top scorers of sanctioned class strength for 2 years.
- Management Scholarships for tuition fees and assistance for books and instruments.
- AICTE-GATE Scholarship of Rs. 12,400/month for student having valid GATE score from AICTE.
- Intramural M.E/M.Tech Student Research Grant to carry out innovative projects in Biotechnology.
- > Sponsorships for students to attend conferences.

Awardees of PG Scholarship



### MAJOR FACILITIES

- > Animal House facilities CCSEA approved
- > Wave Cell Bag Bioreactor for Mammalian Cell Culture
- > Real Time PCR & ELISA, FT-IR
- > Automated Continuous Stirred Tank Bioreactor
- > Computational Systems Biotechnology Laboratory
- > Facilities for Stem Cell Technology
- > Fluorescence & Phase Contrast Microscope
- > High Performance Liquid Chromatography
- > Column chromatographic Systems like FPLC
- Freeze Dryer & Spray Dryer
- > Spectrofluorophotometer
- > 2D Gel Electrophoresis
- > Exclusive cold room facility

### ADMISSION INFORMATION



Eligibility: As per Anna University Guidelines.

Admissions are through Tamil Nadu Common Admissions by Anna University & Entrance Examinations conducted by Consortium for the Management seats.

For department video tour, click the below link https://youtube.com/watch?v=Ryc3-wJ2ACY

# M.TECH. BIOTECHNOLOGY & Ph.D. PROGRAMME (2023-2024)

### ABOUT SVCE

Sri Venkateswara College of Engineering (Autonomous) is a premier self financing institution started in 1985 and received Autonomous status in 2016 and accredited by NAAC with A+ grade. Department of Biotechnology established in 2005 under the guidance of our chairman, Governing Council Dr. A.C. Muthiah, a well known industrialist, in order to explore and experience new frontiers of Biotechnology. The department has started B.Tech Biotechnology in 2005, M.Tech Biotechnology in 2010 & Ph.D. in 2011.

### WHY BIOTECHNOLOGY @ SVCE



- > State of the art research facilities are available to carry out research in various fields & experienced faculty members.
- > Well equipped infrastructure for imparting practical knowledge to the students.
- > MoU with industries to help the students for Internship, Training & Placement.
- > Student Research Day to appreciate innovative students research projects.
- > Encouraging students to take up Entrepreneurship through SVCE-EPIC Scheme.
- > Industry Visits & Guest lectures by eminent speakers from reputed institutions & Industries
- > Handling courses by eminent visiting Professors from Abroad.
- > Motivating students to participate in International competition like iGEM, USA.
- > Encouraging students leadership activity through Technical symposium.
- > Encouraging students to publish their research findings in reputed journals
- Providing placement in biotechnology based core companies like Tata Chemicals Ltd., Zifo RnD Solutions, AstraZeneca, AGS Health, etc.
- Department received research grants (1.71 Crore) from various funding agencies such as DBT, ICMR, DST-SERB, CSIR, AICTE, MSME, TNSCST, etc.
- Department received several grants (23 lakhs) for organizing workshops, conferences, popular lectures, short-term training programmes and FDP from various funding agencies like DBT, CSIR & ICMR, AICTE, EDII, etc.

### RESEARCH FOCUS



- Immunology & Immuno-technology
- Biomaterials & Tissue Engineering
- > Stem Cell Technology
- > Genetic Engineering & rDNA Technology
- > Cellular & Molecular Biology
- > Computational Systems Biotechnology
- > Bioprocess Engineering
- Degenerative Diseases & Regenerative Medicine
- > Herbal Medicines & Antioxidants Research
- > Microbial Technology & Metagenomics

- > Food Biotechnology
- Bioseparation Techniques
- Product Development
- Metabolic Engineering
- > Aquatic Fish Toxicology
- Algal Biotechnology
- Environmental Biotechnology
- Nano-Biotechnology & Drug Delivery

FOR MI

Department webpage

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# **EDITORIAL TEAM**











# STUDENT EDITORIAL TEAM





# DEPARTMENT OF BIOTECHNOLOGY SRI VENKATESWARA COLLEGE OF ENGINEERING













### **COURSES OFFERED**

- 1. B. Tech Biotechnology
- 2. M. Tech Biotechnology
- 3.M.S. (By Research)
- 4. Ph.D. Biotechnology

### A GLIMPSE OF OUR MAJOR FACILITIES



LEICA FLUORESCENT MICROSCOPE

FOR
FURTHER DETAILS
OR
ENQUIRIES

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