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 Sri Venkateswara College of Engineering

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Department of Biotechnology &  **BioAcademy**
(A Technical Blog of Student's Biotech Forum)

Solicit your esteemed presence for a Guest Lecture
on
"STRUCTURED AND UNSTRUCTURED MODELS OF BIOPROCESSES"
for the course
BT18501 Bioprocess Engineering
by
 **Ms. Vidya Muthulakshmi M**
Prime Minister's Research Fellow
Bhupat Jyoti School of Biosciences
Indian Institute of Technology Madras

ALL ARE WELCOME

Venue : Google Meet <https://meet.google.com/skd-wnwu-mbn>
Date : 12th November 2021 (Friday)
Time : 10:00 - 11:00 AM



Report for a Guest Lecture on “Structured and Unstructured Models of Bioprocesses”

A Webinar (SBF- BioAcademy, Bio Talks Series) on “Structured and Unstructured Models of Bioprocesses” was organized by Department of Biotechnology, Sri Venkateswara College of Engineering, Sriperumbudur on 12th November 2021 through Google meet. The webinar was organized for the course BT18501 Bioprocess Engineering. Dr. K. Vasantharaj, Assistant Professor and K. Divakar, Associate Professor Department of Biotechnology organised/coordinated to conduct the webinar. This was organized as part of Bio Talks Series, Bioacademy, Student Biotech Forum.

The session was started with a welcome address by Dr. V. Sumitha, Head, In Charge, Department of Biotechnology. Ms. Divyasakthi M, 3rd year B. Tech Student introduced the guest speaker Ms. VidyaMuthulakshmi M, Prime Minister’s Research Fellow, Bhupat Jyoti School of Biosciences, Indian Institute of Technology Madras. The guest speaker started her technical talk on bioprocess modelling. Then she discussed different types of structured and unstructured models used in bioprocesses.

Participants including UG students, faculty members from Department of Biotechnology, SVCE attended the event. During question and answer/interaction session the guest speaker, Ms. VidyaMuthulakshmi M, addressed the questions raised by the participants and interacted with the participants. In this webinar 98 participants (90 students and 8 faculty members) attended and got benefited.

The session ended with a vote of thanks delivered by Ms. Sanjana, Student of 3rd year B.Tech Biotechnology Department of Biotechnology, SVCE. Guest speaker, Ms. VidyaMuthulakshmi M thanked the organizers and the management of SVCE for organizing this event. The program was very well received by the participants and it was well appreciated.

Screenshots captured during the event

MODEL VALIDATION I

- A model should not be very complex – capturing lots of intracellular processes such that it cannot be validated
- Models that are overly simplistic does not capture biology
- To keep a model simple enough that it can be validated but complex enough to provide useful information – one must know which parameters of the system matter the most
- Sensitivity analysis allows the modeler to determine the **significant** input parameters where changing the values is important that it will affect the input.

<https://www.genengrow.com/en/insights/the-basics-of-bioproccess-models/>

MODEL CLASSIFICATIONS FOR MATHEMATICAL REPRESENTATION OF CELL POPULATIONS I

Unaggregated	Unstructured Cell population treated as one component, solute	Structured Multi-component average cell description
Segregated	Single component, heterogeneous individual cells	Multi-component description of cell-to-cell heterogeneity

TRENDS in Biotechnology

Gernsey, K. V., Lertz, A. E., Turesson, P., Woodley, J. M., & Sin, G. (2010). Application of mechanistic models to fermentation and biocatalysis for next-generation processes. Trends in biotechnology, 28(7), 346-354. doi:10.1016/j.tibtech.2010.05.004

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