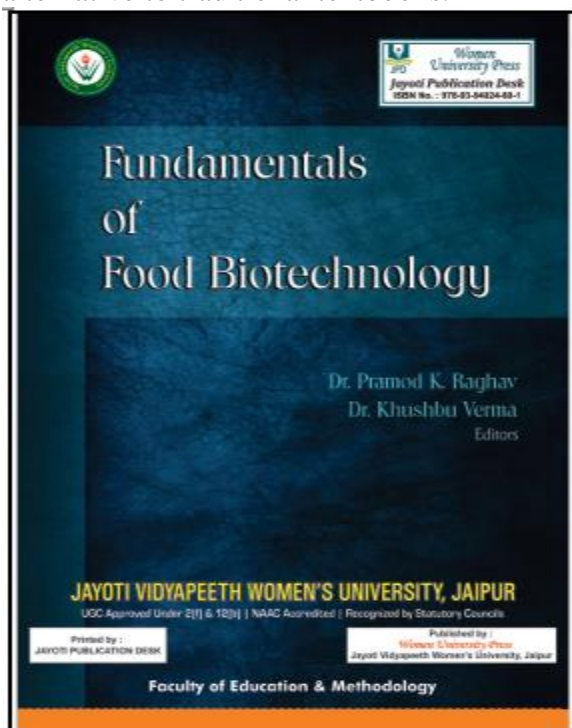


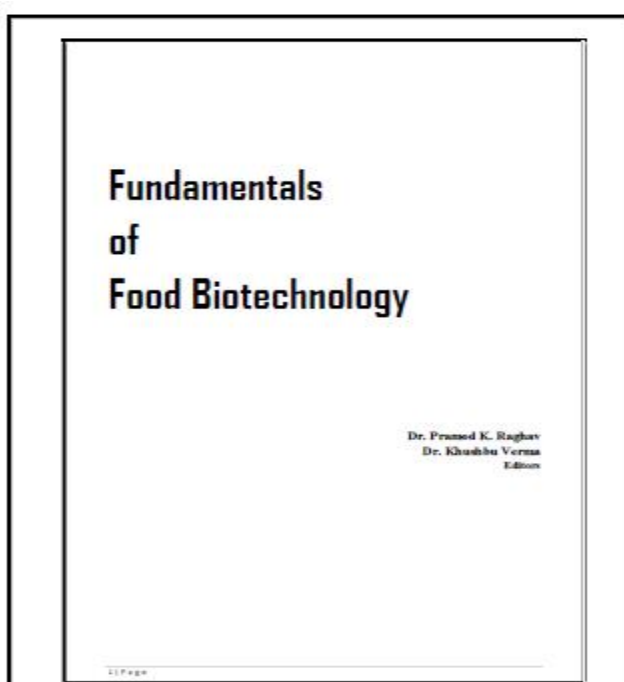
Er. Suhail Ahmad Bhat

Pedagogical innovation: Sample of E- Book

Pedagogical innovation through e-books enhances learning by offering interactive, easily accessible educational content. E-books integrate multimedia, hyperlinks, and search features, making it easier for students to explore and engage with material. This format supports personalized learning, allows instant updates, and provides a more flexible, eco-friendly alternative to traditional textbooks.



Title: Fundamentals of Food Biotechnology
Author Name: Dr. Pramod K. Raghav, Dr. Khushbu Verma
Published By: Women University Press
Publisher's Address: Jayoti Vidyapeeth Women's University, Jaipur
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PREFACE

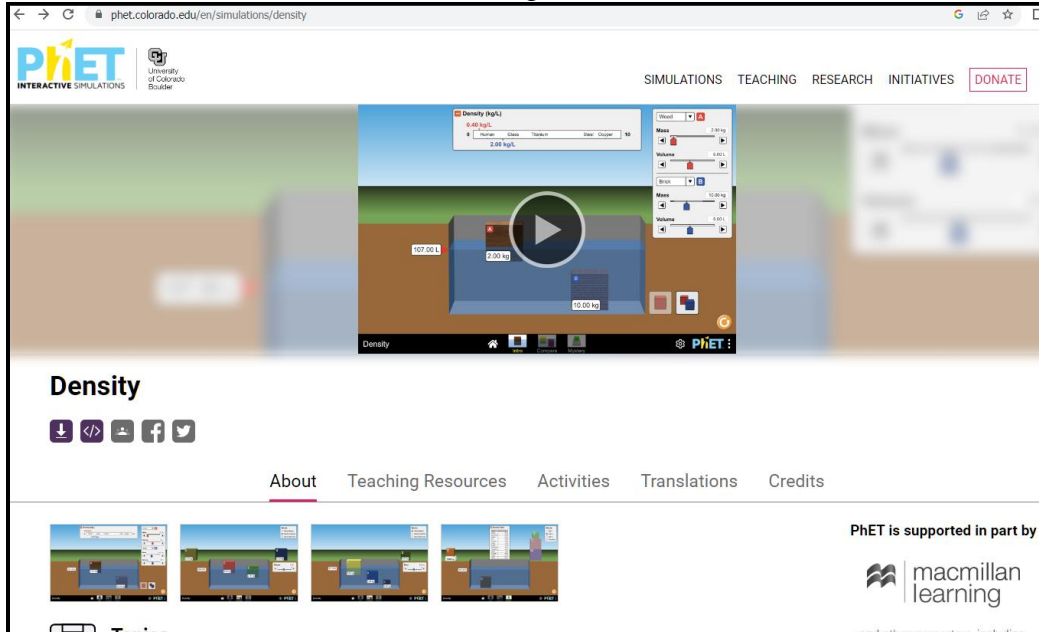
We feel immense pleasure to put forward this book in front of the learners and readers. The book has easy to understand content related to the fundamentals of food and biotechnology. The book has been written keeping in mind those who are the beginners in the area of food technology, food science & technology and food biotechnology. The book begins with the terminology most often used in food technology and biotechnology because it is much important to get familiar with the technical and professional terms used frequently in those disciplines. The book contains the basics of food science & technology including preservation and nutritional importance of the food products so that the learners may get well acquainted with the basics. Further this book has explained the concept of plant tissue culture including the latest plant growing techniques such as hydroponics.

Since in keeping the food safe, microorganisms play an important role so the concept of food microbiology and significance of microbes in food in various aspects has also been explained very effectively by the authors. Biotechnology plays an important role in the environment as well as in managing the food waste hence the principles of environmental biotechnology including the role of biotechnology in waste management has also been elaborated in simple and impressive way with required diagrams and examples. I would like to extend my sincere thanks to JUV's Mishlesh Garg (Chairperson) and JUV's Vaidant Garg (Advisor & CEO), Jayoti Vidyapeeth Women's University, Jaipur, for support, motivation and resources during the writing of this valuable book. Thanks to the entire staff of Department of Food & Biotechnology of the University for their continued support during the completion of this book. I am grateful to all those who directly or indirectly contributed in the completion of this book. The authors will be highly indebted for any type of suggestion or expert opinion so as to further improve the contents of the book.

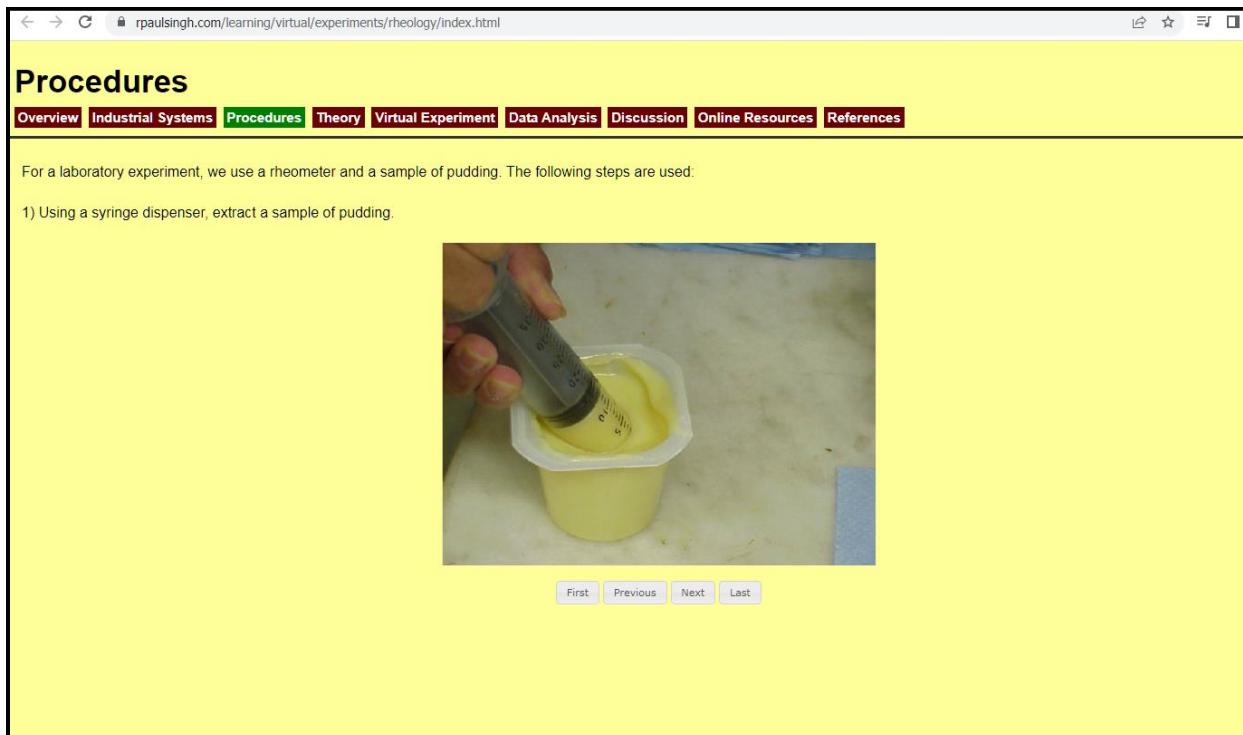
Dr. Pramod K. Raghav
Dr. Khushbu Verma
Editors
Jaipur, Rajasthan

Assessment innovation: Realistic virtual simulation

Assessment innovation through realistic virtual simulations immerses students in dynamic, interactive environments to apply theoretical knowledge. These simulations replicate real-world scenarios, testing decision-making, problem-solving, and practical skills. They offer instant feedback, enhance engagement, and provide a safe, risk-free platform for students to practice and refine their abilities in a controlled setting.



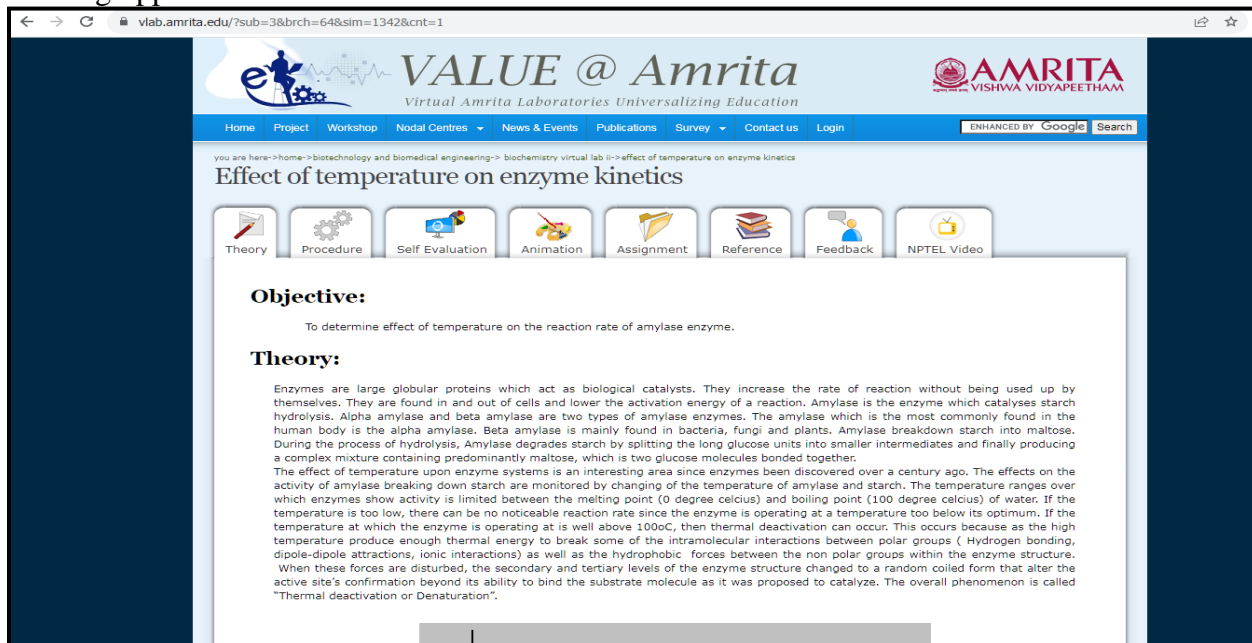
The screenshot shows the PhET Density simulation interface. At the top, the PhET logo and University of Colorado Boulder are visible. The main area features a 3D simulation of a beaker with a red object inside. A play button is centered over the beaker. To the right, there are control panels for 'Density (kg/L)', 'Mass', and 'Volume'. Below the simulation, the title 'Density' is displayed with social media icons. A navigation bar includes 'About', 'Teaching Resources', 'Activities', 'Translations', and 'Credits'. At the bottom, there are thumbnails of other simulations and a logo for 'macmillan learning'.



The screenshot shows a webpage titled 'Procedures' for a rheology experiment. The page has a yellow background. At the top, there is a navigation bar with links: 'Overview', 'Industrial Systems', 'Procedures', 'Theory', 'Virtual Experiment', 'Data Analysis', 'Discussion', 'Online Resources', and 'References'. Below the navigation bar, the text reads: 'For a laboratory experiment, we use a rheometer and a sample of pudding. The following steps are used.' The first step is: '1) Using a syringe dispenser, extract a sample of pudding.' Below the text is a photograph of a hand using a syringe to extract a sample of yellow pudding from a container. At the bottom of the page, there are navigation buttons: 'First', 'Previous', 'Next', and 'Last'.

Digital Innovation: Use of Virtual Labs

Digital innovation through virtual labs provides students with immersive, hands-on experiences in a simulated environment. These labs allow for safe experimentation, making complex concepts more accessible and engaging. They enable students to conduct experiments without physical limitations, enhance learning efficiency, and support flexible, interactive, and remote learning opportunities.



The screenshot shows a web browser window displaying a virtual lab page. The browser's address bar shows the URL: `viab.amrita.edu/?sub=38&brch=64&sim=1342&cnt=1`. The page header features the logo for 'VALUE @ Amrita' (Virtual Amrita Laboratories Universalizing Education) and the 'AMRITA VISHWA VIDYAPEETHAM' logo. A navigation menu includes links for Home, Project, Workshop, Nodal Centres, News & Events, Publications, Survey, Contact us, and Login. A search bar is labeled 'ENHANCED BY Google Search'. Below the navigation, a breadcrumb trail reads: 'you are here->home->biotechnology and biomedical engineering->biochemistry virtual lab ii->effect of temperature on enzyme kinetics'. The main title of the page is 'Effect of temperature on enzyme kinetics'. A horizontal menu of icons provides access to various resources: Theory, Procedure, Self Evaluation, Animation, Assignment, Reference, Feedback, and NPTEL Video. The 'Objective:' section states: 'To determine effect of temperature on the reaction rate of amylase enzyme.' The 'Theory:' section contains two paragraphs. The first paragraph explains that enzymes are large globular proteins acting as biological catalysts, increasing reaction rates without being consumed. It identifies alpha amylase and beta amylase, noting that alpha amylase is most common in humans, while beta amylase is found in bacteria, fungi, and plants. It describes the hydrolysis of starch into maltose. The second paragraph discusses the effect of temperature, noting that activity is limited between 0°C and 100°C. It explains that temperatures below the optimum result in no reaction, while temperatures above 100°C cause thermal deactivation by breaking intramolecular interactions (hydrogen bonding, dipole-dipole attractions, ionic interactions, and hydrophobic forces) that maintain the enzyme's active site structure. This process is called 'Thermal deactivation or Denaturation'.