

### ACTION TAKEN REPORT 2018-19

The stakeholders have appraised the updated course contents, knowledge of the students, willingness towards continuous learning, communication skills, satisfactory level of response from the Institution, etc. The action taken report on the following feedback is mentioned here.

Sl. No.	Feedback	Action taken
1	Recruiters suggested that the students be exposed to concepts of metabolism and nutrition to help them in developing nutritive foods.	Recruiters suggested that the students be exposed to concepts of metabolism and nutrition to help them in developing nutritive foods.
2	Parents suggested that a course on basics of biology can be introduced for non-biology /computers science students so as to impart knowledge on basics of biology.	A new course Basic of Biology (18FP1001) with 2:0:0 was introduced as suggested by parents so that students from non-biology /computers science background could understand the basics of biology.
3	Students requested a course on material science may be included in the curriculum.	A new course on Material Science for Food Engineers (18FP2040) was included into the syllabi to assist students in choosing materials based on their properties for construction and design of food equipment.
4	Alumnus suggested that that a course on modelling and computer simulation maybe offered to broaden the employability.	A new laboratory course titled Simulation, Modelling and Statistical Computing Lab (18FP2041) was introduced into the B.Tech FPE curriculum.

### **Action Taken : 1**

**A new course on Metabolism and Nutrition (18FP2008) was introduced based on the suggestion of recruiters and approval of BoS 2018**

## **18FP2008 METABOLISM AND NUTRITION**

**Credits : 3:0:0**

### **Course Objectives :**

- To understand about metabolic pathways and nutrition
- To apply knowledge on the legal aspects of formulating and labelling functional foods and dietary supplements.
- To develop a food product of high nutritive value

### **Course Outcomes :**

The students will be able to

1. Describe the structure of ATP and identify the major class of macromolecules to which ATP belongs.
2. List the stages in the catabolism of food molecules and describe what occurs during each stage.
3. Describe the biochemistry process, basic concept of human nutrition and the relationship of the consumption of foods to nutritional status and health
4. Evaluate the biological functions of foods for health in addition to nutritional values
5. Evaluate the potential for adverse events related to dietary supplements
6. Apply their knowledge in food biochemistry and nutrition in designing new range of products with improved nutritional characteristics (Nutraceuticals and functional foods).

### **Module 1: Metabolism of Carbohydrates (9 hours)**

Interconnection of pathways, glycolysis (EMP), TCA cycle, gluconeogenesis, Pentose phosphate shunt, Metabolic regulation, Electron transport chain & oxidative phosphorylation Bioenergetics: energy rich compounds

### **Module 2: Metabolism of Fatty Acids (6 hours)**

Biosynthesis and degradation of fatty acids- Beta oxidation- Chain elongation – Biosynthesis of cholesterol

### **Module 3: Metabolism of Fatty Acids and Proteins (6 hours)**

Biosynthesis and degradation of amino acids (one example each for sulphur containing, aliphatic, aromatic, heterocyclic, basic and acidic amino acids); Biosynthesis and degradation of purines, pyrimidines and nucleic acids, urea cycle.

### **Module 4: Concepts of Nutrition (8 hours)**

Basic concept of nutrition – Importance of nutrition and dietetics - Assessment of nutritional status – energy value of carbohydrates, proteins and fats – determination of energy value – balanced diet – Recommended dietary intake – Acceptable dietary intake – Protein efficiency ratio – Net protein utilisation and their determinations – Malnutrition and its problems – Nutrient supplementation & fortification - Nutritional labeling and its importance - Effect of processing on protein quality -carbohydrates in food and dietary fibre.

### **Module 5: Nutritional Disorders (8 hours)**

Inborn errors of carbohydrate, protein and fat metabolisms - Nutrition and disorders associated with organs such as liver and kidney - Naturally occurring anti-nutritional factors – Cyanogens, lectins, enzyme inhibitors, phytoalexins, phytates.

### **Module 6: Specialized Nutrition (8 hours)**

Nutrition for specialized purposes – Pediatric nutrition – geriatric nutrition – Sports nutrition – Nutrition during pregnancy. Ageing –Theories of ageing – Nutrition and ageing – Cancer and its prevention - Age-related metabolic disorders – Nutrition in the treatment of age-related disorders like hypertension, diabetes, alzheimer’s disease.

### **Text Books**

1. Voet D, Voet G, Principles of Biochemistry, 3rd edition, John Wiley and Sons, 2008. ISBN-13: 9780470233962, 978-0470233962.
2. Martin Eastwood, Principles of Human nutrition – 2nd edition. Wiley - Blackwell Publishing, 2003. ISBN: 978-0-632-05811-2

### **Reference Books**

1. Ronald Ross Watson, Functional foods and Nutraceuticals in Cancer Prevention, Ed. Wiley – Blackwell, 2003. ISBN-13: 978-0813818542.
2. Nelson D.L., M.M. Cox, Lehninger Principles of Biochemistry, W.H. Freeman & Company Publications, 2013. ISBN-10: 1-4292-3414-8
3. Tymoczko, J.L., Berg, J.M., Stryer, L. Biochemistry – A short course, 3rd edition. W.H. Freeman. 2009. ISBN-10: 1-4641-2613-5 4.
4. Sunetra Roday., “Food Science and Nutrition – 2nd edition, Oxford Higher Education/Oxford University Press, 2012, ISBN 10: 0198078862



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**SCHOOL OF AGRICULTURE AND BIOSCIENCES**  
**DEPARTMENT OF BIOSCIENCES AND TECHNOLOGY**  
**PROGRAM: FOOD PROCESSING TECHNOLOGY**

**MINUTES OF THE BOARD OF STUDIES MEETING CONDUCTED ON 10.05.2018**

**Internal Members:**

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| 1. Dr. E.J. James          | : Dean (SABS) & Chairman |
| 2. Dr.V.M. Berlin Grace,   | : HOD (BST) & Member     |
| 3. Dr. T. V. Ranganathan   | : Member                 |
| 4. Dr. D. Tiroutchelvame   | : Member Secretary       |
| 5. Er. Dayanand Peter      | : Member                 |
| 6. Dr. M.M. Pragalyaashree | : Member                 |

**External Members:**

1. Dr. V. Thirupathi, Professor, Dryland Agriculture Research Station, Tamil Nadu Agricultural University, Chettinad. (ACADEMIA)
2. Mr. Manuel Tim Prashanth, Proprietor – Cannan Dairy Foods S.F.No.272/1, Chikkinapuram, Selampalayam(PO), Dharapuram – 638672. (ALUMNI)

**Agenda of the meeting**

1. Approval of Program name as per AICTE norms.
2. Approval of course structure and course components (Curriculum) for the 2018-22 B.Tech.(FPT) batch and 2018-20 M.Tech (FPT) as per AICTE regulations.
3. Approval of semester wise courses for the 2018-22 B.Tech.(FPT) batch and 2018-20 M.Tech (FPT).
4. Approval of Syllabus for the 2018-22 B.Tech.(FPT) and 2018-20 M.Tech (FPT).

The BoS meeting was started with opening prayer by Er.N. Princy.

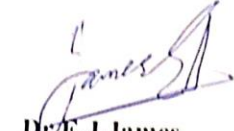
The members discussed in detail on the above-mentioned agenda and the following decisions were made.

1. As per the nomenclature under AICTE, the name of the Food Processing and Engineering program was changed to Food Processing Technology with effect from 2018 batch.

2. The course structure and the list of courses (Curriculum) to be offered to the 2018-22 batch B.Tech.(FPT) and 2018-20 M.Tech (FPT) students were discussed and revised (Annexure-I).
3. The members discussed in detail about the semester wise courses for the B.Tech.(FPT) and M.Tech (FPT) students to be admitted for the academic year 2018-19 (Annexure-II).
4. The members suggested their views and suggestions in the detailed Six-unit syllabus of all the courses. (Annexure-III).
  - a. Members suggested to include the following new courses for the B.Tech Program
    - Basics of biology for food engineers – impart knowledge on basics of biology to improve their entrepreneurial skills
    - Metabolism and Nutrition – helps in developing nutritive foods which will impart entrepreneurial skills to the students.
    - Material Science for Food Engineers – gain in-depth knowledge on strength of materials and design of equipments to enhance their employability skill.
    - Simulation, Modeling and Statistical Computing Lab – helps in improving skill development and employability
  - b. Members suggested to include the following new courses for M.Tech Program
    - Mass Transfer and Separation Processes in Food Engineering
    - Advanced Instrumentation for Food Quality and Safety
    - Engineering Properties of Food Materials
    - Milling, Bakery and Confectionery Technology
    - Emerging Trends in Food Process Engineering
    - Storage Engineering of Food Materials
    - Green Chemistry and Technology
    - Food Supply Chain Management

The above new courses will impart knowledge on recent advancements in food engineering, processing, product development, and the quality and safety of foods for better employability and skill development.

The meeting came to a close with a prayer offered by Dr. R.Emilin Renitta



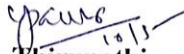
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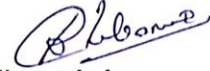
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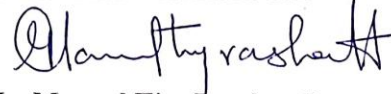
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Dr. D. Tiroutchelvame,  
MEMBER SECRETARY



Dr. M.M. Pragalyaashree,  
MEMBER – INTERNAL



Mr. Manuel Tim Prashanth,  
EXTERNAL MEMBER - ALUMNI

### **Action Taken : 2**

**A new course Basic of Biology (18FP1001) with 2:0:0 was introduced as suggested by parents so that students from non-biology /computers science background could understand the basics of biology.**

## **18FP1001 BASICS OF BIOLOGY FOR FOOD ENGINEERS**

**Credits: 2:0:0**

### **Course Objectives:**

1. To learn a variety of skills necessary to function as a biologist in the workplace or as a candidate for an advanced degree.
2. To develop an awareness of the impact that biology has had on society at large as well as the interactions of biology with other disciplines such as biotechnology and sociology.
3. To demonstrate the ability to articulate, verbally and in writing, knowledge of biology, biological methods, and biological issues in context.

### **Course Outcomes:**

The students will be able to

1. Understand the metabolic processes of cells in terms of cellular organelles, membranes, and biological molecules.
2. Name and describe the basic principles of biology.
3. Demonstrate an ability to effectively convey, both orally and in writing, a knowledge of biological content, methods, and issues.
4. Demonstrate basic knowledge in the basic concepts of bioenergetics, photosynthesis, cellular respiration, nucleic acids and basic concepts of protein synthesis.
5. Describe cellular, biochemical, and physiological aspects of microorganisms and recognize the similarities and differences between microbial groups.
6. Apply problem-solving skills to biological problems and issues.

### **Module 1: Basics of Biology (6 hours)**

Basics of Cell Biology (structure & function) – Discovery of cell and Cell Theory; Comparison between plant and animal cells; Cell wall; Plasma membrane; Modification of plasma membrane and intracellular junctions; Cytoskeleton; Protoplasm; Mitochondria; Chloroplast; ER; Golgi complex; Lysosome, endosome and microbodies; Ribosome; Centriole; Nucleus; Chemical components of a cell; Catalysis and use of energy by cells.

### **Module 2: Membrane Structure & Transport (3 hours)**

Models of membrane structure, Membrane lipids, proteins and carbohydrates; Solute transport by Simple diffusion, Facilitated diffusion and Active transport

### **Module 3: Genetics (4 hours)**

DNA is the genetic material, DNA is a double helix, DNA replication is semiconservative, mutations change the sequence of DNA, a gene codes for a single polypeptide, recombination occurs by physical exchange of DNA, genetic code is triplet.

### **Module 4: Cell Cycle (4 hours)**

An overview of cell cycle; Components of cell cycle control system; Intracellular and Extracellular control of cell division, Programmed cell death (Apoptosis), intrinsic & extrinsic pathways of cell death, Apoptosis in relation with Cancer, Viral disease (AIDS) & Organ transplant.

### **Module 5: Common Mechanisms in Biological Chemistry (9 hours)**

Overview of Digestion, Absorption, Metabolism [Anabolism & Catabolism], Nutrition, Photosynthesis, Respiration, Excretion. Body structure & homeostasis.

### **Module 6: Classification of Microbes (5 hours)**

Systems of classification, Numerical taxonomy, Identifying characters for classification, General properties and principles of classification of microorganisms Systematics of bacteria, Nutritional types [Definition and examples]. Classification on the basis of factors required for the growth of microorganisms.

### **Text Books**

1. Robert F., Weaver, Molecular Biology, 4th ed., McGraw-Hill, 2003. [ISBN-10: 0071275487 | ISBN-13: 978-0071275484]
2. B. Lewin., Genes IX. 9th ed., Jones and Bartlett Publishers, 2007. [ISBN-10: 0763740632 | ISBN-13: 978-0763740634]
3. H.Lodish et al., Molecular Cell Biology. 6th ed., W.H.Freeman, 2007. [ISBN-10: 0716776014 | ISBN-13: 978-0716776017]

### **Reference Books**

1. Alan Cann. Principles of molecular virology, 5th edition. Amsterdam: Elsevier Academic Press, 2012. ISBN- 9780123849403
2. Michael J. Pelczar, E.C.S. Chan, Jr., Noel R. Krieg. Microbiology 7th edition. 2005 Published by Tata McGraw-Hill Education Pvt. Ltd. ISBN 10: 0074623206 / ISBN 13: 9780074623206
3. Karp G., Cell and Molecular Biology: Concepts and Experiments, 3rd Edition (John Wiley & Sons, Inc., 2002).





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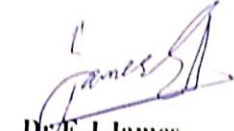
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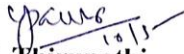
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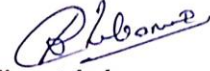
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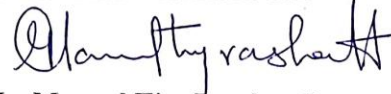
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EXTERNAL MEMBER - ALUMNI

### Action Taken : 3

**A new course on Material Science for Food Engineers (18FP2040) was included into the syllabi to assist students in choosing materials based on their properties for construction and design of food equipment.**

### 18FP2040 MATERIAL SCIENCE FOR FOOD ENGINEERS

**Credits: 3:0:0**

#### Course objectives:

- To understand the fundamentals of material science.
- To impart basic knowledge on the methods of analysis of materials.
- To know the biocompatible material for food industry.

#### Course outcomes:

The student will be able to

1. Enumerate the fundamentals of various bonds.
2. Understand the importance of strength of material.
3. Have a knowledge of the imperfections of metals
4. Have a knowledge of alloying and its importance in everyday life
5. Understand the various methods of characterization.
6. Examine the application of various techniques.

#### Module 1: Introduction to Materials (9 hours)

Introduction to materials, bonding between atoms: metallic bonding, ionic bonding, covalent bonding, Van der Waals bond, thermal expansion, elastic modulus and melting point of materials, Role of materials selection in design, structure-property-processing-performance relationships ; Imperfections in solids: vacancies, equilibrium concentration of vacancies, interstitial and substitutional impurities in solids, dislocations, types and characteristics of dislocations, interfacial defects, stacking faults.

#### Module 2: Strength of Materials (8 hours)

Structure of materials and Strength of Materials: Yield strength, tensile strength, Hardness and ductility of materials: stress strain behaviour of metals, ceramics and polymers,

### **Module 3: Fast fracture, Toughness and Fatigue (5 hours)**

Micromechanism of fast fracture – Mechanism of crack propagation – Fatigue failure – Fatigue of uncracked and cracked components

### **Module 4: Creep and Corrosion (6 hours)**

Creep deformation and creep fracture – Mechanism of creep deformation in metals and designing to lower creep – wet corrosion in materials – Prevention of corrosion

### **Module 5: Carbon steels and Alloys (10 hours)**

Microstructures produced by cooling – Mechanical Properties of normalized carbon steel- Quenched and tempered carbon steels – TTT diagram – Need for alloying – Hardenability and methods – Corrosion resistance – Passivation - Stainless steel and types

### **Module 6: Experimental Techniques (7 hours)**

Introduction to experimental techniques: XRD, NMR, PSA, etc. for material characterization highlighting links between molecular structure and macroscopic properties.

### **Text Books**

1. Michael F. Ashby and David R. H. Jones. “Engineering Materials -1. An Introduction to their Properties and Applications”, 2002. 2nd Edition. Butterworth-Heinemann. ISBN 0 7506 3081 7.
2. Michael F. Ashby and David R. H. Jones. “Engineering Materials -2. An Introduction to Microstructures, Processing and Design”. 2nd Edition. Reprinted 1999. Butterworth-Heinemann. ISBN 0 7506 4019 7.

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1. V. Raghavan. “Materials Science and Engineering: A First Course”, 2004. 5th Edition Prentice Hall India.
2. S. Upadhyaya and A. Upadhyaya, “Material Science and Engineering”, 2007. Anshan Publications.
3. B. S. Mitchell. “An Introduction to Materials Engineering and Science for Chemical and Materials Engineers”, 2004. John Wiley & Sons



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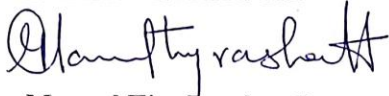
  
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EXTERNAL MEMBER - ALUMNI



## Action Taken : 4

**A new laboratory course titled Simulation, Modelling and Statistical Computing Lab (18FP2041) was introduced into the B.Tech FPE curriculum.**

### **18FP2041 SIMULATION, MODELING AND STATISTICAL COMPUTING LAB**

**Credits: 0:0:1.5**

#### **Course objectives:**

- To understand the fundamentals of simulation.
- To impart basic knowledge on simulation and modeling.
- To know the importance of dynamics and control.

#### **Course outcomes:**

The student will be able to

1. Understand the role of simulation in the design of equipments.
2. Study various methods of calculating the properties.
3. Compute various properties for distillation.
4. Know the transient behavior.
5. Predict the role of modeling and simulation of equipment design.
6. Solve various unit operations involved in food industry.

#### **List of Experiments**

1. Simulation of a Flash drum.
2. Computation of bubble point temperature.
3. Computation of dew point temperature.
4. T-x-y and P-x-y diagram of a binary mixture.
5. Simulation of Continuous Stirred Tank Reactor.
6. Simulation of Plug Flow Reactor.
7. Simulation of the binary distillation column.
8. Simulation of the multi component distillation column.
9. Simulation of the reactive distillation column.
10. Dynamics and control of Continuous Stirred Tank Reactor.
11. Dynamics and control of Plug Flow Reactor.
12. Dynamics and control of a reactive distillation column.



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DEPARTMENT OF BIOSCIENCES AND TECHNOLOGY  
PROGRAM: FOOD PROCESSING TECHNOLOGY**

**MINUTES OF THE BOARD OF STUDIES MEETING CONDUCTED ON 10.05.2018**

**Internal Members:**

- |                            |                          |
|----------------------------|--------------------------|
| 1. Dr. E.J. James          | : Dean (SABS) & Chairman |
| 2. Dr.V.M. Berlin Grace,   | : HOD (BST) & Member     |
| 3. Dr. T. V. Ranganathan   | : Member                 |
| 4. Dr. D. Tiroutchelvame   | : Member Secretary       |
| 5. Er. Dayanand Peter      | : Member                 |
| 6. Dr. M.M. Pragalyaashree | : Member                 |

**External Members:**

1. Dr. V. Thirupathi, Professor, Dryland Agriculture Research Station, Tamil Nadu Agricultural University, Chettinad. (ACADEMIA)
2. Mr. Manuel Tim Prashanth, Proprietor – Cannan Dairy Foods S.F.No.272/1, Chikkinapuram, Selampalayam(PO), Dharapuram – 638672. (ALUMNI)

**Agenda of the meeting**

1. Approval of Program name as per AICTE norms.
2. Approval of course structure and course components (Curriculum) for the 2018-22 B.Tech.(FPT) batch and 2018-20 M.Tech (FPT) as per AICTE regulations.
3. Approval of semester wise courses for the 2018-22 B.Tech.(FPT) batch and 2018-20 M.Tech (FPT).
4. Approval of Syllabus for the 2018-22 B.Tech.(FPT) and 2018-20 M.Tech (FPT).

The BoS meeting was started with opening prayer by Er.N. Princy.

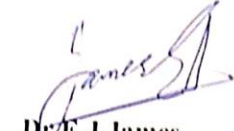
The members discussed in detail on the above-mentioned agenda and the following decisions were made.

1. As per the nomenclature under AICTE, the name of the Food Processing and Engineering program was changed to Food Processing Technology with effect from 2018 batch.

2. The course structure and the list of courses (Curriculum) to be offered to the 2018-22 batch B.Tech.(FPT) and 2018-20 M.Tech (FPT) students were discussed and revised (Annexure-I).
3. The members discussed in detail about the semester wise courses for the B.Tech.(FPT) and M.Tech (FPT) students to be admitted for the academic year 2018-19 (Annexure-II).
4. The members suggested their views and suggestions in the detailed Six-unit syllabus of all the courses. (Annexure-III).
  - a. Members suggested to include the following new courses for the B.Tech Program
    - Basics of biology for food engineers – impart knowledge on basics of biology to improve their entrepreneurial skills
    - Metabolism and Nutrition – helps in developing nutritive foods which will impart entrepreneurial skills to the students.
    - Material Science for Food Engineers – gain in-depth knowledge on strength of materials and design of equipments to enhance their employability skill.
    - Simulation, Modeling and Statistical Computing Lab – helps in improving skill development and employability
  - b. Members suggested to include the following new courses for M.Tech Program
    - Mass Transfer and Separation Processes in Food Engineering
    - Advanced Instrumentation for Food Quality and Safety
    - Engineering Properties of Food Materials
    - Milling, Bakery and Confectionery Technology
    - Emerging Trends in Food Process Engineering
    - Storage Engineering of Food Materials
    - Green Chemistry and Technology
    - Food Supply Chain Management

The above new courses will impart knowledge on recent advancements in food engineering, processing, product development, and the quality and safety of foods for better employability and skill development.

The meeting came to a close with a prayer offered by Dr. R.Emilin Renitta



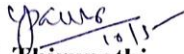
Dr. E.J. James  
Dean(SABS) i/e  
CHAIRMAN



Dr. T. V. Ranganathan,  
MEMBER – INTERNAL



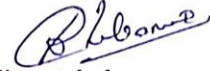
Er. Dayanand Peter,  
MEMBER – INTERNAL



Dr. V. Thirupathi,  
EXTERNAL MEMBER – ACADEMIA



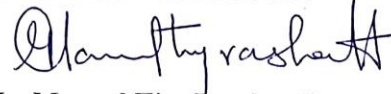
Dr. V.M. Berlin Grace,  
MEMBER – INTERNAL



Dr. D. Tiroutchelvame,  
MEMBER SECRETARY



Dr. M.M. Pragalyaashree,  
MEMBER – INTERNAL



Mr. Manuel Tim Prashanth,  
EXTERNAL MEMBER - ALUMNI