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Department of Aeronautical Engineering

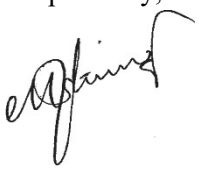
AY: 2019-20 **Date: 11.01.2021**

Action taken report -Employer Feedback

S.No	Analysis	Action taken report
1.	Experimental Aerodynamics should be offered as Core course instead of Professional Elective in the next revision of Curriculum & Syllabi. Heat and Mass Transfer should be offered as Core course instead of Professional Elective in the next revision of Curriculum & Syllabi.	Will be considered in the next revision of Curriculum & Syllabi as suggested by member
2.	Department can acquire Supersonic Wind Tunnel facility & Flow diagnostics techniques for High Speed Aerodynamics laboratory courses as well as research activities.	AICTE MODROBS is submitted for Supersonic Wind Tunnel facility & Flow diagnostics techniques for High Speed Aerodynamics laboratory
3.	Students should be encouraged to develop CFD codes in addition to usage of commercial software.	Value added course is conducted on "Computational studies of industry & research applications" using OpenFOAM (2020-21)
4.	Cluster of Manufacturing Techniques course should be introduced to aeronautical students creating employment opportunities in manufacturing sectors, in the next revision UAV System Design course name can be modified as Autonomous Vehicle System Design in the next revision Industry 4.0, IoT & Electronics concepts should be introduced	Will be considered in the next revision of Curriculum & Syllabi as suggested by member

	Industrial Visits and Internships should be arranged to the students and faculty promoting industrial linkages.	
5.	U18AER0001 Introduction to Aeronautics should be offered as Core course instead of Mandatory Non-credit course The course "Introduction to Aeronautics" should be offered during first or second semester Include the chapters related to aero stream of Heat Transfer and Thermodynamics in Propulsion course in the next revision of Curriculum & Syllabi.	Will be considered in the next revision of Curriculum & Syllabi as suggested by member
6.	Number of teaching hours for core courses should be increased	Credits increased for Flight Dynamics & Aircraft Design Courses from 3 to 4
7.	Explore XFLR5, VSP-Aero and SU2 tools for Aircraft Design, CFD and Aerodynamics courses. Students should be encouraged to develop CFD codes in addition to usage of commercial software.	Industry Oriented One Credit Course - U17AEC0206 CFD Codes (Commercial & Open Source) with applications & validations is offered for students of R2017.

Prepared By,



BoS Coordinator

Approved By,

BoS Chairman

Proof for Action Taken: 2 AICTE MODROBS is submitted for Supersonic Wind Tunnel facility & Flow diagnostics techniques for High Speed Aerodynamics laboratory

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www.kct.ac.in
An Autonomous Institution
Established in 1984
Affiliated to Anna University Chennai
Approved by AICTE, New Delhi
Accredited by NAAC

Date: 7.1.2021

CERTIFICATE

Certified that the department of Aeronautical Engineering, Kumaraguru College of Technology, Coimbatore is submitting MODROB - Regular Application for **Modernization of High Speed Aerodynamics Laboratory**. In this proposal, NO industrial contribution is committed.

Reference: AQIS Application Id 1-9326712021 / MODROB - Regular Application

PRINCIPAL.

Dr. J. SRINIVASAN, M.Tech.,Ph.D.
PRINCIPAL
Kumaraguru College of Technology
Coimbatore - 641 049.

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Proof for Action Taken: 3 Value added course is conducted on "Computational studies of industry & research applications" using OpenFOAM (2020-21)

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Department of Aeronautical Engineering, KCT

Value added course on " Computational studies of industry & research applications."

The focus of the current course is to introduce an open-source CFD tool, OpenFOAM, widely used commercial CFD tools to students and make them acquainted with using it to solve simple problems and understand the implementation of modelling and solution settings to successfully obtain results. OpenFOAM is an industry standard on the open-source end and is used extensively by businesses and academia alike.

Objective: widely used commercial CFD tools , OpenFOAM & CFD basics training- 30 hours

Topics:

1. **CFD basics introduction → (2 hours)**

   Basic introduction and review of key points in learning CFD. Set basic outline of the course.

2. **OpenFOAM introduction & linux basics → (2-3 hours)**

   Introduction to OpenFOAM structure and as an analysis tool. Basics of linux commands required for running OpenFOAM.

3. **Meshing tools for OpenFOAM → (3 hours)**

   Meshing tools for creating mesh files for OpenFOAM. External meshing tool Gmsh, and BlockMesh operation within OpenFOAM.

4. **Simple problem 1, setup → (3 hours)**

   Setup a simple problem in OpenFOAM environment – subsonic flow over bluff body/ supersonic flow over wedge. Introduction to problem setup and running the simulation.

5. **Simple problem 1, analysis → (2-3 hours)**

P. S. Premkumar

Dr.P.S.Premkumar

HOD AERO

Simple problem analysis by learning about various schemes and settings to understand the effect on accuracy (order of schemes) and solution behavior (solution stability and steering).

6. **Simple problem 2, analysis → (2-3 hours)**

   Setup simple flow problem again. Focus on boundary conditions of different types and how to implement them in OpenFOAM. Introduce various solvers in OpenFOAM.

7. **Nozzle/shock tube problem → (3 hours)**

   Setup a supersonic nozzle problem. Run the problem by using various initial conditions and their implementation, including a shock tube problem.

8. **Diffusion solution setup → (2 hours)**

   Setup viscous problem in OpenFOAM with introduction to turbulence model setup for fluid flow.

9. **CFD applications to Wind energy domain – 3 Hours**
10. **CFD applications to Gas turbine domain – 3 hours**
11. **ICEMCFD live examples with Structured & Unstructured grid – 4 hours**

Resource Persons

- Dr. S. Ganesan, Scientist-G, Group Director, Afterburner and Exhaust System (ABES)
- Dr Jaikumar Loganathan, Sub-Section Manager, Turbine Aero, Aero Combustion & Operability Tools, GE Aviation
- Dr Tarandeep singh, CFD Free Lancer, IISc, Bangalore
- Mr Karthick Murugesan, CFD Application Engineer, Beta CAE systems , Bangalore

P. S. Premkumar

Dr.P.S.Premkumar

HOD AERO

Proof for Action Taken: 6 Credits increased for Flight Dynamics & Aircraft Design Courses from 3 to 4

Semester VI										Pre-requisite
S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C	
1	U18AET6001	Flight Dynamics	Theory	PC	4	0	0	0	4	U18AEI4201
2	U18AET6002	Finite Element Method	Theory	PC	3	0	0	0	3	U18AEI3203
3	U18AET6003	Vibrations and Aeroelasticity	Theory	PC	3	0	0	0	3	U18AEI5202
4	U18AET6104	Rocket Propulsion	Theory	PC	2	1	0	0	3	U18AEI5205
5	OE II	Open Elective II	Theory	OE	3	0	0	0	3	-------
6	U18AEE00--	Professional Elective I	Theory	PE	3	0	0	0	3	-------
7	U18AEP6505	Design and Simulation Laboratory	Lab	PC	0	0	2	0	1	U18AET5003
8	U18AEP6506	Airframe and Aero Engine Maintenance Laboratory	Lab	PC	0	0	2	0	1	-------
								Total Credits	**21**	
								Total Contact Hours/week	**23**	

Semester VII										Pre-requisite
S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C	
1	U18AEI7201	Aircraft Design	Embedded-Theory & Lab	PC	3	0	2	0	4	U18AET6001
2	U18AET7002	Aviation Logistics and Supply Chain Management	Theory	PC	3	0	0	0	3	-------
3	U18AEI7203	Avionics	Embedded-Theory & Lab	PC	2	0	2	0	3	U18EEI3202
4	U18AEE00--	Professional Elective II	Theory	PE	3	0	0	0	3	-------
5	U18AEE00--	Professional Elective III	Theory	PE	3	0	0	0	3	-------
6	U18AEE00--	Professional Elective IV	Theory	PE	3	0	0	0	3	-------
7	U18AEP7704	Project Work – Phase I	Project	PW	0	0	0	6	3	-------
								Total Credits	**22**	
								Total Contact Hours/week	**27**	

Proof for Action Taken: 7 Industry Oriented One Credit Course - U17AEC0206 CFD Codes (Commercial & Open Source) with applications & validations is offered for students of R2017.

Introductory CFD course syllabus for KCT (Aerospace)

Course content shall not be mathematically rigorous, with concepts handled with minimum math and as much physical and flow dynamics significance as possible, aimed to get students interested in CFD analysis.

The motivation of the course is to provide a structural understanding of the general CFD procedure, which equips the student to be able to understand and use any new software tool with greater ease.

1. **Introduction** **1 hour**

   Introduction to the concept and importance of CFD. Emphasis on CFD usage in academic research and industrial work with practical examples. Breakdown of two streams of CFD – physics of the flow and mathematical solution of equations.

2. **Basic Equations** **1 hours**

   Short review of basic conservation laws for NS equations. Various simplified forms derived and physical assumptions explained, including basic assumptions for thermodynamics of fluids.

   Classification of PDEs. How classification helps in physically understanding the problem as well as setting up mathematical solutions with examples.

3. **Numerical Discretization** **1 hours**

   Taylor series review. Introduction to finite difference method and various simple differencing schemes. Features of first order and second order general schemes. Grid stencil concept for time stepping in explicit and implicit methods. Introduction to numerical stability and CFL condition.

   Concept of numerical viscosity and approximate solution of flow equations. Application and examples of numerical viscosity. Introduction to concept of upwind schemes.

4. **Meshing – practical** **5 hours**

   Basic philosophy of meshing. Different types of mesh elements and their applications. Introduction to ANSYS ICEMCFD and the concept of blocking. Practice with few simple examples of meshing in ICEMCFD and Gmsh.

5. Solving in ANSYS Fluent – practical 5 hours

Philosophy of setting up a CFD problem and basic introduction to Fluent. Some or all of the following examples with practice in ANSYS Fluent including solving and basic postprocessing:

- Flow around cylinder – Karman Vortex Street problem
- Flow over an airfoil
- Supersonic flow over a forward-facing step
- Practical example – fin air cooling problem with unsteady heat conduction

6. Introduction to open source CFD tools 2 hours

Introduction to Gmsh – open source meshing tool. Introduction to OpenFOAM, open source solver suite. The following examples with practice in OpenFOAM solvers and postprocessing in ParaView:

- CD nozzle problem

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Department of Electrical and Electronics Engineering

AY: 2019-20 **date: 04-12-2020**

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	In Automotive Electronics, topics on battery management, power steering control and ISO Standards could be added.	Suggestion will be considered in next regulation
2.	In Internet of Things (IOT) course, it is suggested to include Machine Monitoring and Electrical related experiments.	Included in the IOT course.

PreparedBy,

Dr.V.Kandasamy

BoS Coordinator

Approved By,

4/12/20

Dr.K.Malarvizhi

BoS Chairman

Proof for Action Taken: 2 - Included Machine Monitoring and Electrical related experiments.

U18EEE0008	INTERNET OF THINGS	L	T	P	J	C
		2	0	2	0	3

COURSE OUTCOMES

After successful completion of this course, the students would be able to

CO1	Outline the Internet of Things Architecture, Sensor, Actuators and Networking	**K2**
CO2	Summarize various hardware and software elements of IoT	**K2**
CO3	Outline the various associated technologies of IoT	**K2**
CO4	Illustrate IoT for different Commercial and Industrial applications.	**K2**
CO5	Model the IoT application	**K3**

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1					S									
CO2					S									
CO3					S									
CO4					S									
CO5					S								S	S

COURSE ASSESSMENT METHODS

Direct
1. Continuous Assessment Test I, II 2. Model Examination (For Practical Courses & Embedded Courses) 3. Assignment, Open Book Test, Cooperative Learning Report, Group Presentation, Problem based Learning, Project based Learning, Mini Projects, Project Report, Quiz, Role Play, Self-Explanatory Videos, Prototype or Product Demonstration etc. (as applicable) 4. End Semester Examination
Indirect
1. Course End Survey 2. Programme Exit Survey 3. Placement/Higher Education Record 4. Feedback (Students, Employers, Parents, Professional Body members, Alumni)

THEORETICAL COMPONENT CONTENTS:

Introduction to IoT **8 hours**

Architectural Overview, Design principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT Technology Fundamentals- Devices and gateways, Data management, Business processes in IoT, Everything as a Service(XaaS), Role of Cloud in IoT, Security aspects in IoT.

Elements of IoT **9 Hours**

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Hardware Components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, I/O interfaces.
Software Components- Programming API's (using Python/Node.js/Arduino) for Communication Protocols-MQTT, BLE, CoAP, UDP, TCP, LoRa WAN.

Associated Technologies **8 Hours**

Introduction to SDN-SDN for IoT, Data Handling and Analytics, Cloud Computing-Cloud Computing, Fog Computing-Edge Computing, Li-Fi.

APPLICATIONS **5 Hours**

Smart Cities and Smart Homes-Connected Vehicles, Smart Grid, Industrial IoT, Precision Agriculture, Healthcare.

PRACTICAL COMPONENT CONTENTS:
LIST OF EXPERIMENTS

Arduino I/O programming

1. LED and DIP Switch
2. Interfacing with Sensor and Actuators
3. Interfacing with LCD Display
4. Communication over Bluetooth-MIT APP Inventor
5. Cloud Interfacing (Azure/Amazon web services/Think speak)

Raspberry Pi Programming using Python

6. LED and DIP Switch
7. Interfacing with Sensor and Actuators
8. To install MySQL database on Raspberry Pi and perform basic SQL queries.
9. Write a program to create TCP/UDP server on Arduino/Raspberry Pi and respond with humidity data to TCP client when requested.
10. Cloud Interfacing (Azure/Amazon web services/Think speak)

Study on Industrial IoT Gateway and LoRa Communication

REFERENCES

1. Vijay Madisetti, Arshdeep Bahga, Ïnternet of Things, "A Hands on Approach", University Press
2. David Hanes, "IoT Fundamentals Networking Technologies, Protocols, and Use Cases for Internet of Things", CISCO Press, 2017
3. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press, 2017
4. Raj Kamal, "Internet of Things: Architecture and Design", McGraw Hill
5. NPTEL Reference: https://nptel.ac.in/courses/106/105/106105166/

Theory: 30 **Tutorial: 0** **Practical: 30** **Project: 0** **Total: 60 Hours**

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DEPARTMENT OF BIOTECHNOLOGY

Action Taken Report - "Employers Feedback"
Academic Year 2019-20

Date: 11-Jan 2021

S.No	Suggestions	Action Taken
1.	Need more knowledge on real time application	Case studies have been included in all basic and application oriented subjects.
2.	Need more exposure to clinical trials and its process	U18BTT6001 Bio-pharmaceutical Technology and U17BTT7002 Preclinical and Clinical Regulatory Affairs subjects covers the basic and in depth analysis of clinical trails and its process.

Prepared by
BOS Coordinator

Approved by
Chairman BOS

Proof: Topics on Clinical Trial included in the Syllabus

U17BTT7002	PRECLINICAL AND CLINICAL & REGULATORY AFFAIRS	L	T	P	PJ	C
		3	0	0	0	3

Course Objectives:

- Understand key areas of drug development: preclinical and clinical research regulations
- Understand the basic concepts of trial management, clinical data analysis and reporting

Course Outcomes (COs):

After successful completion of the course, the students should be able to

CO1: Understand the regulatory aspects and ethical considerations involving human subjects.
CO2: Understand the timelines and resources required to discover and develop new drugs in a preclinical setting.
CO3: Demonstrate an understanding of the critical features of each stage of the preclinical drug development process.
CO4: Classify different types of trial designs.
CO5: Apply and demonstrate critical analysis of clinical data using statistical analysis tools
CO6: Identify quality parameters of clinical research report.

Pre-requisite:

1. U17BTI6205 Biological Data Analysis
2. U17BTT6001 Biopharmaceutical Technology

CO/ PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

	PROGRAMME OUTCOMES (Pos)												PSOs	
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S		M										S	S
CO2	S			W									S	
CO3	S	M			S								S	
CO4	S											M	S	
CO5			S									M	S	
CO6										S			S	

Course Assessment Methods			
Direct		Indirect	
1	Internal Tests	1	Course end survey
2	Assignments		
3	End semester examination		

Course Content **45 hours**

1. **REGULATORY BODIES AND ETHICAL GUIDELINES** **9 hours**

Regulatory bodies: National and International perspective, Drug and in vitro diagnostic device regulatory submissions, approvals and registrations, Ethical guidelines in Clinical Research: Nuremberg code, Declaration of Helsinki, Belmont report; International Conference on Harmonization, Drug and cosmetic act; Schedule Y, ICMR Guidelines: National Ethical Guidelines for Biomedical and Health Research Involving Human Participants

2. **DRUG DISCOVERY AND PRECLINICAL RESEARCH** **9 hours**

Drug development phases, Preclinical drug development, Types of Pre-clinical trials, safety studies, dose response information to support drug registration, Guidelines for animal studies, carcinogenicity studies, chronic toxicity testing in animals, Importance of CYP Metabolism studies, Pharmacodynamics (PD): Toxicity LD_{50} and ED_{50}.

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3. **CLINICAL RESEARCH** **9 hours**

Scope of Clinical Research, Good Clinical Practices (GCP), History of clinical research, Belmonte report, Thalidomide disaster, Types of clinical trials, Special Clinical Trials, Medical Devices Trials, Investigator Brochure, Informed Consent Form, Sponsor Monitor and Investigator responsibility, SOP in Clinical Trials, Clinical Trial Monitoring, Role of CRA, QA and QC in Clinical Trials, CRF Design, Study management: Monitoring process, Coordinating protocol implementation

4. **CLINICAL RESEARCH STUDY DESIGNS** **9 hours**

Overview of study design, Types of studies: Experimental, uncontrolled, RCTs, other designs – equivalence, non-inferiority, observational, retrospective, sample size, bias and confounding, Experimental Design – Randomized Clinical Trials: parallel-group design, stratified parallel group design, parallel group randomized block design, complete cross-over design, simultaneous treatments design, factorial design. Types of randomization: simple, blocked, stratified and Adaptive, Blindness:– unblinded, Single Blind, Double-blind and Triple blind trials. Case Study: Clinical Trial Study Design

5. **CLINICAL DATA ANALYSIS AND REPORT** **9 hours**

Types of data and normal distribution, significance tests and confidence intervals, comparison of means, comparison of proportions, analysis of survival data, subgroup analysis, regression analysis, Good Clinical Data Management Practices, Data Management Plan, CRF designing. Serious adverse event data reconciliation, Database closure, Design and analysis of surveys, CDISC standards, Dataset preparation for analysis, Overview of reporting, Internal and external reporting.

Theory: 45 hours Tutorial: 0 hours Practical: 0 hours Project: 0 hours Total hours: 45

Textbooks:

1. Tom Brody, (2016) Clinical Trials: Study Design, Endpoints and Biomarkers, Drug Safety, and FDA and ICH Guidelines, Academic Press.
2. Stephen B Hulley, Steven R Cummings, Warren S Browner, Deborah G Grady, Thomas B Newman,(2008) Designing clinical research, Second edition Lippincott Williams & Wilkins Publishers.
3. T.A. Durham and J Rick Turner. (2008) Introduction to statistics in pharmaceutical clinical trials. Pharmaceutical Press.
4. Antonella Bacchieri, Giovanni Della Cioppa (2007). Fundamentals of Clinical Research , First edition, Springer publishers

Web-References:

1. `http://www.ich.org/products/guidelines/safety/safety-single/article/preclinical-safety-evaluation-of-biotechnology-derived-pharmaceuticals.html`
2. `http://clinicalcenter.nih.gov/training/training.html`
3. `https://onlinecourses.science.psu.edu/stat509/node/6/`

***

Signature of BOS Chairman

Proof : Inclusion of Case studies in the syllabus

U17BTI7203 BIOINFORMATICS

L	T	P	PJ	C
3	0	2	0	4

Course Objectives:

- Introduce the student to biological data resources, algorithms and alignment tools
- Apply various algorithms and computational tools for protein structure and stability analysis.

Course Outcomes (COs):

After successful completion of the course, the students should be able to

CO1: To introduce the concept of biological sequence alignment and various genome sequence protocols.
CO2: To familiarize with various biological database searches, parameters and algorithm.
CO3: To apply, interpret and analyze multiple sequence alignments.
CO4: To construct, interpret and access molecular phylogenetic tree prediction .
CO5: To apply, interpret and analyze protein structures prediction algorithms.
CO6: To introduce the concept of computer-aided drug designing (CADD).

Pre-requisite:

1. U17BTI3204 Concepts in Biochemistry
2. U17BTI4203 Cell and Molecular Biology
3. U17BTI5202 Protein and Enzyme Technology

CO/ PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

	PROGRAMME OUTCOMES (Pos)												PSOs	
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	M		S	M										
CO2	S	S		M	S							M	M	M
CO3	S	S		M	S							S	S	S
CO4	S	M		M	S								S	S
CO5	S	S	M	M	M							M	S	S
CO6	S	S	M	M	M							M	M	M

Course Assessment Methods			
Direct		Indirect	
1	Internal Tests	1	Course end survey
2	Assignments		
3	End semester examination		

Course Content **60 hours**

1. **INTRODUCTION TO BIOINFORMATICS** **9 hours**

Introduction to Bioinformatics; Biological Sequences – Formats; Databases – types, architecture of Biological Databases; Sequence Identify and Similarity, Edit distance – Levenstein and Hamming Distance. Dot plot analysis.

2. **SEQUENCE ALIGNMENT** **12 hours**

Sequence alignment – Pairwise alignment; Gaps – Constant, Linear, Affine, Convex and Profile-based gaps; Dynamic Programming algorithm – Needleman and Wunch Algorithm, Smith-Waterman Algorithm; Scoring Matrices – PAM and BLOSSUM; BLAST. Limits of detection & significance. Advanced BLAST: PSI-BLAST & PHI-BLAST. Introduction to Next Generation Sequencing techniques and applications.

Case Study: NGS-based sequencing for infectious diseases.

Signature of BOS Chairman

3. **MULTIPLE SEQUENCE ALIGNMENT** **7 hours**

Multiple Alignment Methods – Block-based methods for multiple-sequence alignment, Algorithm of multiple sequence alignments: Sums of pairs method (SP), CLUSTAL W, PILEUP; Overview of iterative MSA methods; Construction of Position-Specific Scoring Matrices (PSSM).

4. **PHYLOGENETICS** **7 hours**

Molecular Phylogenetics – Newick Format, Methods for tree construction – Unweighted pair group method of arithmetic mean (UPGMA), Fitch-Margoliasch algorithm (FM), Neighbor-Joining method (NJ); Character based methods: Maximum parsimony, maximum likelihood, Tree Reconstruction and evaluation - Bootstrapping technique.

Case Study: Computational exploration of coevolution.

5. **APPLICATIONS IN BIOINFORMATICS** **12 hours**

Prediction of secondary structure – Globular and Transmembrane protein, Prediction of Tertiary structure – Homology Modeling and Threading. Methods for predicting conserved patterns in protein sequence and structure; Comparison of protein tertiary structures.

Introduction to Drug Discovery Process, Target Identification and Validation, Virtual Screening of lead compounds, Docking – Principles, Rigid and Flexible docking.

Case study: Drug discovery approaches targeting a metabolic pathway.

List of Experiments:

1. Basics of Unix Commands & Scripting
2. Biological Sequence Retrieval
3. Molecular Visualization using Pymol
4. Sequence Homology using BLAST
5. Multiple Sequence Alignment
6. Phylogenetic Analysis
7. NGS Data Analysis of SNP Identification
8. Molecular Modelling of Protein structure and Loop refinement
9. Molecular Docking

Theory: 45 hours Tutorial: 0 hours Practical: 30 hours Project: 0 hours Total hours: 60

Textbooks:

1. Pevzner, P., & Shamir, R. (Eds.). (2011). Bioinformatics for biologists. Cambridge University Press.
2. Higgins, D., & Taylor, W. (2000). Bioinformatics: sequence, structure and databanks. New York: Oxford University Press.
3. Rastogi, S. C., Rastogi, P., & Mendiratta, N. (2008). Bioinformatics Methods And Applications: Genomics Proteomics And Drug Discovery 3Rd Ed. PHI Learning Pvt. Ltd..
4. Baxevanis, A. D., Bader, G. D., & Wishart, D. S. (Eds.). (2020). Bioinformatics. John Wiley & Sons.
5. Gu, J., & Bourne, P. E. (Eds.). (2009). Structural bioinformatics (Vol. 44). John Wiley & Sons.
6. Stawinski, P., Sachidanandam, R., Chojnicka, I., & Ploski, R. (2016). Basic Bioinformatic Analyses of NGS Data. In Clinical Applications for Next-Generation Sequencing (pp. 19-37). Academic Press.

Signature of BOS Chairman

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Department of Information Technology

AY: 2019-20 **Date: 11.01.2021**

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	Participation in hackathon competitions to be increased	Students are motivated and encouraged to attend hackathon ,ideation competitions
2.	Suggested to provide 5 credits for Internships by reducing project phase-1 credits. (Project phase-1 has 12 credits)	
3.	Change the title of the subject 'Data Science & Analytics using Python' to 'Introduction to Data Analytics'. The students may be given the choice of choosing the language for implementation	Will be incorporated in 2022 regulations.

Prepared by

BoS Coordinator

Approved by

BoS Chairman

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Department of Textile Technology

AY: 2019-20 **Date: 11.01.2021**

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	In the course U18TXI6201/Garment Manufacturing Technology 3D body scanning topic can be included	In the course U18TXI6201/Garment Manufacturing Technology 3D body scanning topic included
2.	Anti-microbial testing concepts can be included in the course U18TXE0012/Bio polymers and medical textiles	Anti-microbial testing concepts included in the course U18TXE0012/Bio polymers and medical textiles

Approved by

Dr.V.Ramesh Babu

BoS Chairman

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Department of Textile Technology

AY: 2019-20 **Date: 11.01.2021**

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	In the course U18TXI6201/Garment Manufacturing Technology 3D body scanning topic can be included	In the course U18TXI6201/Garment Manufacturing Technology 3D body scanning topic included
2.	Anti-microbial testing concepts can be included in the course U18TXE0012/Bio polymers and medical textiles	Anti-microbial testing concepts included in the course U18TXE0012/Bio polymers and medical textiles

Proof

In the course U18TXI6201/Garment Manufacturing Technology 3D body scanning topic included

L	T	P	J	C
2	0	2	0	3

U18TXI6201 GARMENT MANUFACTURING TECHNOLOGY

Course Outcomes (COs)

After successful completion of this course, the students should be able to

CO1: Develop the pattern making, grading and marker making for Kids, Baby's, Men's and Women's wear.

CO2: Discuss the Requirements and Methods of Marker planning and Cutting.

CO3: Describe different types of Stitches & Seams and sewing machine.

CO4: Explain different types of accessories used in garment industry.

CO5: Explain different types of pressing methods.

Pre-requisite: NIL

CO-POs & PSOs Mapping (S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes (POs) & Programme Specific Outcomes (PSOs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	S	S	S		M								S	
CO2	M	S	S		S								M	
CO3	M												M	
CO4	M												M	
CO5	S	S	S							M			S	

PATTERN MAKING **6 Hours**

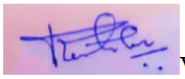
Introduction to garment manufacturing-Pattern making: Definition- Head theory- Measuring of sizes and Size chart-Seam allowances- Drafting, Grading and Draping- Grain lines- Dart. Development of patterns: Kids wear: Baby's frock- Men's wear: Shirt and Trouser- Women's wear: Plain skirt.

CUTTING **6 Hours**

Marker planning: Requirements and Methods-Marker efficiency-Advantages of computer aided marker planning. Spreading: Requirements and Methods-Types spreading and lay. Cutting: Objectives-methods- cutting machines-Straight knife-Round knife-Band knife- Die cutting-computer controlled cutting-Lectra-Gerber-Tuka-Reach CAD.3D body scanning.

SEWING **6 Hours**

Definition of Stitch and Seam- Stitch and Seam classifications- Classification of sewing machines – based on application, based on bed type. Basic stitching machine-principle parts and their functions. Mechanism of stitch formation in lock stitch machine -Feed system: Drop feed system-Unison feed-Differential feed-Compound feed. Stitch and seam defects – causes and remedial measures



V.Ramesh Babu

Signature of BOS chairman, TXT

Anti-microbial testing concepts included in the course U18TXE0012/Bio polymers and medical textiles

U18TXE0012 BIO POLYMERS AND MEDICAL TEXTILES

L	T	P	J	C
3	0	0	0	3

Course Outcomes (COs)

After successful completion of this course, the students should be able to

CO1: Outline on biopolymers.
CO2: Explain health care textiles.
CO3: Discuss on implant textiles
CO4: Summarize non-implantable and corporeal textiles.
CO5: Illustrate on the wound dressing and smart textiles.

CO-POs & PSOs Mapping
(S/M/W indicates strength of correlation)S-Strong, M-Medium, W-Weak

COs	Programme Outcomes (POs) & Programme Specific Outcomes (PSOs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	M												M	
CO2	M	M											M	
CO3	M												M	
CO4	M												M	
CO5	M	M											M	

Course Assessment methods

Direct	Indirect
1. Internal test I 2. Internal test II 3. Assignment/ Seminar/ Tutorial 4. End Semester Examination	1. Course end survey

BIOPOLYMERS **9 Hours**

Classification of biopolymers used in medicine – Natural biopolymers - properties and applications. Synthetic biopolymers - raw material, synthesis, properties, storage stability and sterilization of biopolymers. Evaluation of biopolymers - *In vitro* tests- direct contact, agar diffusion, elution methods, *In vivo* assessment of biopolymers to tissue compatibility. Concepts of antimicrobial testing in textiles.

HEALTH CARE TEXTILES **9 Hours**

Classification of medical textiles, current market scenario in international and national level – government initiatives. Operating room garments- personal health care and hygiene products and their testing methods; applications of non-wovens in medicine; textiles in infection prevention control.


V.Ramesh Babu
Signature of BOS chairman, TXT

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Department of Automobile Engineering

AY: 2019-20

Date: 11.01.2021

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1	Employer insisted to include the courses which are part of competitive exam coaching and communication skill improvement activities.	Competitive exam coaching is separately done.
2	For interested students arrange internships for each semester holidays and give them exercise to choose one topic on their internship and do as a project.	Internships are arranged in every semester holidays from the department by Internship coordinator.
3	Include the tools such as DFMEA, six sigma, APQP, company process flow etc like these various necessary topics add as a small course with added credits.	Guest lectures were arranged on all the topics by KC-IRI.

Prepared By,

BoS Coordinator

Approved By,

BoS Chairman

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Department of Civil Engineering

AY: 2019-20 **11.01.2021**

Action taken report - Employer Feedback

S.No	Analysis	Action taken report
1.	A course on Railways Airport and Dock can be offered as an elective.	An elective course on 'U18CEE0018 Railways Airport Dock and Harbour Engineering' is introduced.
2.	LCA/EMS/Auditing was suggested to be included in the syllabus content.	Included in the course on 'P18EET3001 Environmental Impact Assessment'
3.	Content on Carbon Sequestration capture, Bioplastics need to be included	Included in the course on 'P18EEE0002 Climate Change and Adaptation'
4.	Content related to bending torsion, torsion of thin-walled beams, warping constants.	Included in the course on 'P18SET1001 Advanced Solid Mechanics'

Prepared by,

BoS Coordinator

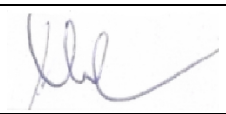
Approved by,

BoS Chairman

4	U18CEE0016	Building Information Management	Theory	PE	3	0	0	0	3
5	U18CEE0017	Mass Transit Management	Theory	PE	3	0	0	0	3
6	U18CEE0018	Railways Airport Dock and Harbour Engineering	Theory	PE	3	0	0	0	3

Open Electives
(OFFERED TO STUDENTS OF OTHER DEPARTMENTS)

S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C
1	U18CEO001	Climate Change Impact on Water Resources	Theory	OE	3	0	0	0	3
2	U18CEO002	Fundamentals of Soil and Water Conservation Engineering	Theory	OE	3	0	0	0	3
3	U18CEO003	Green Building Concept and Design	Theory	OE	3	0	0	0	3
4	U18CEO004	Landscape Designing	Theory	OE	3	0	0	0	3
5	U18CEO005	SUSTAINABLE TECHNOLOGIES AND CIRCULAR ECONOMY	Theory	OE	3	0	0	0	3
6	U18CEO006	Green Building Design- Civil Engineering Focussed Tools and Techniques	Theory	OE	3	0	0	0	3



Signature of the Chairman
BOS/Civil Engineering

P18EET3001 ENVIRONMENTAL IMPACT ASSESSMENT

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Classify the need of EIA/EIS process and regulatory aspects involved

CO2: Implement the appropriate methodologies for environmental impact prediction and assessment

CO3: Quantify the environmental impacts on the ecosystem (land, air, water) and Socio Economic Aspects

CO 4: Mitigate the negative environmental impacts on various eco system

CO 5: Conduct EIA for developmental projects

Course Objectives:

In this course, the students are exposed to learn the need, methodology, documentation and usefulness of environmental impact assessment and to develop the skill to prepare environmental management plan. Scientific aspects such as predictions and evaluation methods as well as democratic aspects relating to public participation are also explained to the students.

Pre-requisite: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

Cos	Programme Outcomes(POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S				
CO2	S	S				
CO3	S	S				
CO4	S	S				
CO5	S	S				

Course Assessment Methods

Direct
1. Mid Term Examination 2. Research Assignment, Group Presentation 3 End Semester Examination
Indirect
1. Course-end survey

INTRODUCTION **9 Hours**

EIA Definition - Historical development and need for Environmental Impact Assessment (EIA) – Environmental Impact Statement (EIS) – EIA in project cycle - Capability and limitations – Legal and Regulatory aspects in India – EIA process - Types and Stages of EIA – MoEF guidelines for performing EIA of development projects - Cross sectoral issues and terms of reference in EIA – Public Participation in EIA

IMPACT IDENTIFICATION AND PREDICTION **9 Hours**

Signature of BOS chairman, CE

Matrices – Networks – Checklists –Cost benefit analysis – Analysis of alternatives – Software packages for EIA – Expert systems in EIA. Prediction tools for EIA – Mathematical modeling for impact prediction – Assessment of impacts – air, water, soil, noise, biological, social & cultural activities and on flora & fauna- Mathematical models- Public participation - Cumulative Impact Assessment

SOCIAL IMPACT ASSESSMENT AND EIA DOCUMENTATION 9 Hours

Social impact assessment - Relationship between social impacts and change in community and institutional arrangements. Individual and family level impacts. Communities in transition Documentation of EIA findings – planning – organization of information and visual display materials – Report preparation.

ENVIRONMENTAL MANAGEMENT PLAN 9 Hours

Environmental Management Plan - preparation, implementation and review - Mitigation and Rehabilitation Plans – Policy and guidelines for planning and monitoring programmes – Addressing the issues related to the project affected people - Post project monitoring - Post project audit – Ethical and Quality aspects of Environmental Impact Assessment

CASE STUDIES 9 Hours

EIA for infrastructure projects – Dams – Highways – Multi-storey Buildings Water Supply and Drainage Projects – Wastewater treatment plants – Localized area specific industrial projects.

Theory: 45 Hrs Tutorial: 0 Hrs Practical: 0 Hrs Project: 0 Total: 45 Hrs

REFERENCES

1. Canter R.L., "Environmental Impact Assessment", McGraw Hill Inc., New Delhi, 1996.
2. Environmental Assessment Source book", Vol. I, II & III. The World Bank, Washington, D.C., 1991.
3. John G. Rau and David C Hooten "Environmental Impact Analysis Handbook", McGraw Hill Book Company, 1990.
4. Judith Petts, "Handbook of Environmental Impact Assessment Vol. I & II", Blackwell Science, 1999.
5. Shukla, S.K. and Srivastava, P.R., "Concepts in Environmental Impact Analysis", Common Wealth Publishers, New Delhi, 1992.

Signature of BOS chairman, CE

P18EEE0002	CLIMATE CHANGE AND ADAPTATION	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Apply the different concept of climate change and its consequences
CO2: Adopt the methodologies in finding the changes in climate
CO3: Apply basic climatic modelling
CO4: Predict climate changes and downscaling techniques
CO5: Identify impacts of climate changes

Course Objectives:

At the end of the course, the students should understand the Earth's Climate System and the concept of Global Warming. The students should be able to comprehend the impact of climate change on society and its mitigation measures.

Pre-requisite: Nil

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

Cos	Programme Outcomes(POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1		S				S
CO2		S				S
CO3		S				S
CO4		S				S
CO5		S				S

Course Assessment Methods

Direct
1. Mid Term Examination 2. Research Assignment, Group Presentation 3 End Semester Examination
Indirect
1. Course-end survey

EARTH'S CLIMATE SYSTEM **9 Hours**

Introduction-Climate in the spotlight - The Earth's Climate Machine – Climate Classification - Global Wind Systems – Trade Winds and the Hadley Cell – The Westerlies - Cloud Formation and Monsoon Rains – Storms and Hurricanes - The Hydrological Cycle – Global Ocean Circulation – El Nino and its Effect - Solar Radiation –The Earth's Natural Green House Effect – Green House Gases and Global Warming – Carbon Cycle.

OBSERVED CHANGES AND ITS CAUSES **9 Hours**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Observation of Climate Change – Changes in patterns of temperature, precipitation and sea level rise – Observed effects of Climate Changes – Patterns of Large Scale Variability Drivers of Climate Change – Climate Sensitivity and Feedbacks – The Montreal Protocol UNFCCC – IPCC –Evidences of Changes in Climate and Environment – on a Global Scale and in India – climate change modeling.

MODELLING CLIMATE CHANGE **9 Hours**

Basics of Modelling – Governing equations, parameters; Current climate models- climate model evaluation, evaluation of climate model components, sensitivity, updates from IPCC

CLIMATE PREDICTION **9 Hours**

Short term climate forecast, medium range climate forecast, long range prediction, predictiability for regional climate – Global climatic models, Statistical downscaling techniques

POTENTIAL IMPACTS OF CLIMATE CHANGE **9 Hours**

Impacts of Climate Change on various sectors – Agriculture, Forestry and Ecosystem – Water Resources – Human Health – Industry, Settlement and Society

Theory: 45 Hrs Tutorial: 0 Hrs Practical: 0 Hrs Project: 0 Total: 45 Hrs

REFERENCES

1. Dash Sushil Kumar, Climate Change – An Indian Perspective, Cambridge University Press India Pvt. Ltd, 2007
2. IPCC Fourth Assessment Report – The AR4 Synthesis Report, 2007
3. Jan C. van Dam, Impacts of Climate Change and Climate Variability on Hydrological Regimes, Cambridge University Press, 2003.

Signature of BOS chairman, CE

P18SET1001 ADVANCED SOLID MECHANICS

L	T	P	J	C
3	0	0	0	3

Course Outcome

After successful completion of this course, the students should be able to

CO1: Formulate equilibrium and compatibility equations for 3D problems

CO2: Formulation of boundary value problems in linearized elasticity and solution of 2D problems using Airy's stress functions.

CO3: Solution to boundary value problems corresponding to end torsion of prismatic beams

CO4: Analyze using plastic theories

CO5: Analyze using fracture mechanics

Pre-requisites: Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak						
COs	Programme Outcomes (POs)					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	W					
CO2	W					
CO3				M		
CO4				S		
CO5				S		

INTRODUCTION TO ELASTICITY **12 Hours**

Elasticity approach-Definition and notation of stress - components of stress and strain - generalized Hooke's Law - Transformation of stresses and strains - Stress invariants - Principal stresses and strains for three-dimensional element - Equilibrium equations and compatibility conditions in Cartesian and cylindrical coordinates.

BOUNDARY VALUE PROBLEMS: FORMULATION **12 Hours**

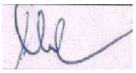
Airy's stress functions for plane stress and strain problems-Bending of a cantilever and simply supported narrow rectangular cross-section under different loads –Asymmetric problems like thick and thin cylinders subjected to internal pressure-Stress concentrations due to circular hole in plate –Non-axisymmetric problems like Flemant approach

END TORSION OF PRISMATIC BEAMS **8 Hours**

Formulation of the BVP for torsion of beams with solid cross section - warping function and Prandtl stress function approach-Torsion of circular, elliptic, rectangular and triangular cross sections-Membrane analogy-Torsion of thin walled tubes-thin rectangular sections, rolled sections and multiply connected section

PLASTIC DEFORMATION **9 Hours**

Strain Hardening, Idealized Stress- Strain curve, Yield Criteria, von Mises Yield Criterion, Tresca Yield Criterion, Plastic Stress-Strain Relations, Principle of Normality and Plastic Potential, Isotropic Hardening.



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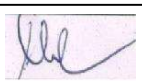
INTRODUCTION TO FRACTURE MECHANICS **4 Hours**

Failure criteria and fracture toughness– stress intensity factor.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Richard. G. Budynas, Advanced Strength and Applied Stress Analysis, McGraw-Hill, New Delhi, Second Edition, 2011
2. Chakrabarty, Theory of Plasticity, Tata McGraw Hill Book Co., New Delhi, 2012.
3. L.S. Srinath, Advanced Mechanics of Solids, Tata McGraw Hill, 2007.
4. Chwo P.C. and Pagano N.J., Elasticity Tensor, Dyadic and Engineering Applications, D.Van Nastrand and Co., Inco. 2013
5. M.H. Sadd, Elasticity: Theory, Applications and Numeric, Academic Press, 2006.
6. Timoshenko S. and Goodier J.N., Theory of Elasticity, Hill Education., India, Third Edition, 2010.
7. Sadhusingh, Theory of Elasticity, Khanna Publishers, New Delhi, Fourth Edition, 2012.
8. A.R. Ragab and S.E. Bayoumi, Engineering Solid Mechanics: Fundamentals and Applications, CRC Press, 1999.



Signature of BOS Chairman, CE

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Department of Computer Science and Engineering

AY: 2019-20

Date: 11.01.2021

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	Few of the elective's courses in the curriculum can be offered as the core course - Example: Blockchain Technology, Machine Learning, etc.	The suggestion will be taken and courses related to recent trends may be included as core course

Prepared By
(Feedback/BoS Coordinator)
(Dr. D. Chandrakala)

Approved By
(Signature of Bos Chairman)
(Dr. P. Devaki)

Professor & Head
Department of
Computer Science and Engineering
Kumaraguru College of Technology
COIMBATORE-641 006, INDIA

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KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE-641049

(An Autonomous Institution affiliated to Anna University, Chennai)

Action Taken Report - Employer Feedback

Department of Electronics and Communication Engineering

Academic Year: 2019 – 2020

Date: 11.01.2021

S.No	Feedback	Action Taken
1.	Content focusing start up initiatives may be included as options to cater entrepreneurial aspirants	Students are encouraged to take up prototyping semester tailored to cater the aspirants with approved syllabus
2.	Mandatory internship to be introduced as a part of regular curriculum.	Industry offered one credit courses were introduced and students can take up one semester long internship during VIII semester as a part of the U18ECP8701-Project Phase II.

Prepared By,

BoS Coordinator

Approved By,

BoS Chairman

Proof for Action taken 2: Industry offered one credit courses were introduced and students can take up one semester long internship during VIII semester as a part of the U18ECP8701-Project Phase II.

Semester VII										
S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C	Pre-requisite
1	U18ECP7701	Project Phase I	Project only Course	PW	0	0	0	6	3	-
2	U18ECT7002	Wireless Communication	Theory	PC	3	0	0	0	3	U18ECI6201
3	U18ECI7203	Optical Communication	Embedded - Theory & Lab	PC	3	0	2	0	4	-
4	U18ECI7204	RF and Microwave Engineering	Embedded - Theory & Lab	PC	3	0	2	0	4	U18ECT4104
5	U18ECE...	Professional Elective III	Theory	PE	3	0	0	0	3	-
6	U18ECE...	Professional Elective IV	Theory	PE	3	0	0	0	3	-
7	U18ECE...	Professional Elective V	Theory	PE	3	0	0	0	3	-
								Total Credits	23	
								Total Contact Hours/week	28	

Semester VIII									
S.No	Course code	Course Title	Course Mode	CT	L	T	P	J	C
1	U18ECP8701	Project Phase II	Project only Course	PW	0	0	0	24	12
								Total Credits	12
								Total Contact Hours/week	24

Total Credits	161

Signature of BOS chairman, ECE

Proof for Action taken 1: Students are encouraged to take up prototyping semester tailored to cater the aspirants with approved syllabus

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROTOSEM 19.2

Name List

S.No	Roll No	Name
1.	17BEC020	Nithesh C
2.	17BEC022	Haridharan S
3.	17BEC024	Ageeth Tanish T
4.	17BEC054	Ashok E
5.	17BEC056	Madhumitha M
6.	17BEC065	Vennila R
7.	17BEC071	Nikhil shriram.R
8.	17BEC078	Shrinithi V
9.	17BEC080	Sona K
10.	17BEC081	Shreyans Nair
11.	17BEC085	Rohini G
12.	17BEC100	Vishnupriya R
13.	17BEC118	Harshapradha M

Faculty Incharge

HOD ECE

KUMARAGURU COLLEGE OF TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROTOSEM 19.2 COURSE MAPPING

SEMESTER V

S.NO	COURSE CODE	COURSES OFFERED IN KCT CURRICULUM	COURSE CODE COURSES OFFERED BY FORGE	COURSES OFFERED BY FORGE (EQUIVALENCE)	COURSE CATEGORY	L	T	P	J	C
1	U17INI5600	Engineering Clinics 3	U17ECPS17	Startup Fundamentals	ES	1	0	0	4	3
2	U17.....	Open Elective II	U17ECPS11	Applied Design Thinking	OE	3	0	0	0	3
3	U17ECE...	Professional Elective I	U17ECPS12	Electronic System Design	PE	3	0	0	0	3
4	U17ECE...	Professional Elective II	U17ECPS14	Artificial Intelligence of Things	PE	3	0	0	0	3
5	U17ECE...	Professional Elective III	U17ECPS16	Industrial Design and Product Development	PE	3	0	0	0	3
6	U17ECE...	Professional Elective IV	U17ECPS15	App Development & Android Things	PE	3	0	0	2	3
7	U17INI6600	Engineering Clinics 4	U17ECPS13	Embedded System Design and Development	ES	1	0	0	4	3
8	U17ECP7701	Project Phase I	U17ECPS19	MUP Product Design and Development	PW	0	0	0	6	3
9	U17VEP5505	Human Excellence-Social Values	U17VEP5505	Special Workshop	HS	1	0	0	0	1
					TOTAL	**18**	**0**	**0**	**16**	**25**

FACULTY CO-ORDINATOR

CURRICULUM CO-ORDINATOR

HOD ECE

SEMESTER VI

S.No	COURSE CODE	COURSES OFFERED IN KCT CURRICULUM	COURSE CODE COURSES OFFERED BY FORGE	COURSES OFFERED BY FORGE (EQUIVALENCE)	COURSE CATEGORY	L	T	P	J	C
1	U17ECI5201	Communication Engineering- I **(V Semester Course)**			PC	3	0	2	0	4
2	U17ECI5202	VLSI and HDL Programming **(V Semester Course)**			PC	3	0	2	0	4
3	U17ECT5005	Antenna and wave propagation **(V Semester Course)**			PC	3	0	0	0	3
4	U17ECI6201	Communication Engineering- II **(VI Semester Course)**			PC	3	0	2	0	4
5	U17ECI6202	RF and Microwave Engineering **(VI Semester Course)**			PC	3	0	2	0	4
6	U17VEP6506	Human Excellence-National Values			HS	1	0	0	0	1
					Total	**16**	**0**	**8**	**0**	**20**

FACULTY CO-ORDINATOR

CURRICULUM CO-ORDINATOR

HOD ECE

SEMESTER VII

S.No	COURSE CODE	COURSES OFFERED IN KCT CURRICULUM	COURSE CODE COURSES OFFERED BY FORGE	COURSES OFFERED BY FORGE (EQUIVALENCE)	COURSE CATEGORY	L	T	P	J	C
1	U17ECI5203	Communication Networks **(V Semester Course)**			PC	3	0	2	0	4
2	U17ECT5004	Control Systems **(V Semester Course)**			PC	3	0	0	0	3
3	U17ECT7002	Wireless Communication			PC	3	0	0	0	3
4	U17ECI7203	Optical Communication			PC	3	0	2	0	4
5	U17INT7000	Professional Communication & Analytical Reasoning			HS	3	0	0	0	3
6	U17VEP7507	Human Excellence-Global Values			HS	1	0	0	0	1
					Total	**16**	**0**	**4**	**0**	**18**

FACULTY CO-ORDINATOR

CURRICULUM CO-ORDINATOR

HOD ECE

SEMESTER VIII

S.NO	COURSE CODE	COURSES OFFERED IN KCT CURRICULUM	COURSE CODE COURSES OFFERED BY FORGE	COURSES OFFERED BY FORGE (EQUIVALENCE)	COURSE CATEGORY	L	T	P	C
1.	U17ECP8701	Project Phase II			PW	0	0	24	12
				TOTAL		0	0	24	**12**

UNMAPPED COURSES

S.NO	COURSE CODE COURSES OFFERED BY FORGE	COURSES OFFERED BY FORGE (EQUIVALENCE)	CREDIT
1	U17ECPS18	IPR Fundamentals and Patent Drafting	3
		TOTAL	3

K. Anusha

FACULTY CO-ORDINATOR

CURRICULUM CO-ORDINATOR

HOD ECE

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Department of Electronics & Instrumentation Engineering

AY: 2019-20 25.11.2020

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	To include the topic Pipelining in ARM Controller in the course U18EII5202 - Embedded Microcontroller	Incorporated
2.	Include Regenerative Braking & Dynamic Braking concepts in the Professional Elective course, Industrial Electronic Drives.	Incorporated
3.	Suggestion to include Robotics as core paper and to include simulation software in the field of robotics	Since the total credits exceed the limit, it's difficult to include as core paper.

Prepared By,

V. Mathi

V. Mamekalai AP/EIE

BoS Coordinator

Approved By,

BoS Chairman

Proof For ATR Point No. 1

U18EII5202 EMBEDDED MICROCONTROLLERS

L	T	P	J	C
3	0	2	0	4

Course Outcomes (CO):

After Successful completion of this course, the students will be able to :

CO1: Relate microcontroller architecture to embedded development.
CO2: Develop algorithms for embedded system design.
CO3: Practice serial protocol programming with microcontrollers.
CO4: Specify appropriate protocol for given application.
CO5: Demonstrate real-time communication interface.
CO6: Apply protocols for device driver requirements.
Pre-requisite: U18EII4202 - Digital fundamentals and microprocessors.

COs	PO												PSO	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	M	W												
CO2	S	M	W	W						W			M	
CO3	S	S	M	M										
CO4	M	W								M			M	
CO5	S	M	W											
CO6	S	S	S	S	M					S	W	M	S	

Course Assessment Methods:	
Direct	**Indirect**
• Internal Tests • Assignment • Model Lab Exam • End Semester Theory & Practical Exam	• Course Exit Survey

Course Content:

INTRODUCTION TO ARM ARCHITECTURE AND MCU (9 hours)

Overview of ARM architecture and design -Pipelining- Embedded Code Debugging Tools n Tips - MCU Memory Map - MCU Bus Interfaces- MCU Clocks and Details - MCU Peripheral Clock Control- MCU Vector table- MCU interrupt Design - NVIC - Interrupt handling - MCU Specific Header file- Importance of "Volatile" Keyword

GPIO REGISTERS AND CODE DRIVER (9 hours)

GPIO- GPIO Programming structure and Registers- GPIO Driver Development - Driver header file - GPIO Driver Development- Implementing Init API - GPIO Driver Development. Implementing Read/Write APIs - GPIO driver Code testing. Writing Sample APP- GPIO Interrupt Handling

UART FUNCTIONAL BLOCK, INTERRUPT HANDLING AND CODE DRIVER (9 hours)

UART Essentials, UART functional block and Peripheral Clock - Communication - Interrupts – Registers - Driver Development: Getting Started. UART Driver Development: Driver Header File - Writing init Function - Writing TX/RX function - Interrupt Handling, UART sample application: Getting ready, UART sample application: Implementation

K.K.

BOS Chairman

I2C PROTOCOL FUNCTIONAL BLOCK, INTERRUPTS AND LOGIC ANALYZER(9hours)

I2C Essentials, protocol Operating Modes- Addressing mode, Functional block diagram and Clocks - Interrupts – Peripheral - Registers -Master/Slave Communication.

I2C Driver Development: Getting started-Driver Development: Driver header file - Init Function- Writing TX/RX API - Event Interrupt handling for master, Event Interrupt handling for slave - Error Interrupt Handling - Writing I2C sample application: Getting ready, Writing I2C sample Application: Master Code Testing and Protocol Decoding using logic analyzer.

SPI PROTOCOL FUNCTIONAL BLOCK AND DRIVERS **(9 hours)**

SPI Essentials - phase, polarity and SPI modes. SPI: Functional Block and Clock, SPI Important Registers. SPI Driver Development - Writing Driver header file. SPI Driver Development: Implementing init API - SPI Master/Slave Communication - SPI Driver Development: Implementing TX/RX API.

List of experiments

1 To Blink an LED using RPi.
2 a) ADC Interfacing using RPi.
b) Potentiometer Interfacing using RPi.
3 Pulse width modulation using RPi.
4 Serial Communication using RPi.
5 Data Monitoring systems in website using RPi.
6 Data Monitoring systems in mobile app using RPi.
7 GPIO Driver Development and Implementing Read/Write in APIs using STM Controller.
8 Serial Communication interfacing the TX/RX function in UART using STMController.
9 Serial Communication interfacing Interrupt Handling in UART using STM Controller
10 ADC interfacing with UART communication using STMController.
11 Event Interrupt handling for master and slave communication in I2C using STMController.
12 SPI Driver Development: Implementing TX/RX API using STMController.
13 Serial Communication Timer interfacing using EEPROM and implement in STM Controller
14 Mini project.

Theory Hours: 45	**Practical Hours: 30**	**Total Hours:75**

REFERENCES

1. Geoffrey Brown "Discovering the STM32 Microcontroller".
2. microcontroller peripheral devices and examples of typical by QIU SHI KE JI BIAN ZHU
3. Steve Furber, "ARM System on Chip Architecture" Addison- Wesley Professional Second Edition, Aug 2000.
4. Device Driver Programming by Concurrent Computer Corporation
5. Jason Andrews "Co-Verification of Hardware and Software for ARM System on Chip Design (Embedded Technology)" Newnes, BK and CD-ROM (Aug 2004).
6. P. Rashinkar, Paterson and L.Singh, "System on a Chip Verification – Methodologies and Techniques", Kluwer Academic Publishers, 2001.
7. David Seal "ARM Architecture reference Manual", Addison-Wesley Professional;2nd Edition,2001
8. Alan Clement, "The Principle of computer Hardware", 3rd Edition, Oxford University Press.

K.K.

BOS Chairman

Proof for ATR Point No. 2

U18EIE0017 INDUSTRIAL ELECTRONIC DRIVES

L	T	P	J	C
3	0	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Choose the power devices based on the application. (K3)
CO2: Evaluate the performance parameters of AC-DC converters with R, RL and RLE Load. (K3)
CO3: Describe the functioning of various DC-DC converters and inverters. (K3)
CO4: Identify the drives for various control applications. (K3)

Pre-requisite courses:

1. U18EII1201: Basic Electronics
2. U18EII2201: Electric Circuits
3. U18EII3201: Analog Electronics

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes (POs) / Programme Specific Outcomes (PSOs)													
	PO1 (K3)	PO2 (K4)	PO3 (K5)	PO4 (K5)	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1 (K4)	PSO2 (K4)
CO1 (K3)	S	M	W										M	
CO2 (K3)	S	M	W	W									M	
CO3 (K3)	S	M	W	W									M	
CO4 (K3)	S	M	W	W									M	

Course Contents

POWER CONVERSION & POWER SEMICONDUCTOR SWITCHES 7 Hrs

Need for power conversion - Power electronic converters - classifications and scope; Construction, Operating Principle, Static and Dynamics Characteristics of Power Diode - Power BJT -SCR - TRIAC- MOSFET – IGBT; Ratings & Protection of Switches.

CONVERTERS 9 Hrs

Single Phase and Three Phase Half & Fully Controlled Rectifier with R, RL, RLE Load - Effect of Source Inductance - Continuous and Discontinuous Mode of Operation - Performance Analysis – Dual Converter – Simulation Analysis of Converters using MATLAB / MULTISIM.

CHOPPERS 8 Hrs

Step up and Step down Chopper – Chopper Classification - Quadrant of Operation – Switching Mode Regulators - Buck, Boost, Buck-Boost, and Cuk Regulators - Simulation Analysis of Choppers using MATLAB / MULTISIM.

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INVERTERS 9 Hrs

Single Phase and Three Phase (both 120° and 180° Modes of Operation) Inverters - PWM techniques: Sinusoidal PWM, Modified Sinusoidal PWM and Multiple PWM – Voltage Source Inverters - Current Source Inverters - Multilevel Inverters - Simulation Analysis of Inverters using MATLAB / MULTISIM.

INDUSTRIAL DRIVES & APPLICATIONS 12 Hrs

Determination of Speed and Torque Requirements for Specific Motion Profiles, Introduction to DC Drives & AC Drives - Electrical Braking -Regenerative Breaking- Open loop and Closed Loop Control of Drives (Block Diagram Approach only) - Stepper Motor Drives - Position Control - Servo Drives.

Applications: Switched Mode Power Supply - Uninterrupted Power Supply – FACTS – HVDC Transmission.

Theory : 45 Hrs **Total Hrs: 45**

REFERENCES

1. Muhammad H. Rashid, 'Power Electronics: Circuits, Devices and Applications', Prentice Hall of India / Pearson Education, 4th Edition, 2017, ISBN-13: 978-9332584587.
2. Singh M.D. Khanchandani, K.B., "Power Electronics", 3rd Edition, McGraw-Hill, 2017, ISBN 13: 9780070583894.
3. Bimbhra P. S. 'Power Electronics', Khanna Publishers, 2006 ISBN-13: 978-8174092151.
4. Ned Mohan, Tore. M. Undelan, William P. Robbins, 'Power Electronics: Converters, Applications and Design', John Wiley and Sons, Third Edition, 2007, ISBN-13:978126510900.
5. Bimal K. Bose, 'Modern Power Electronics and AC Drives', Pearson Education, 1st Edition, 2015, ISBN-13: 978-9332557550.
6. Moorthi V. R., 'Power Electronics - Devices, Circuits and Industrial Applications', Oxford University Press, 2005, ISBN: 9780195670929.
7. Dubey G. K., 'Power Semiconductor Controlled Drives,' Prentice Hall International, New Jersey, 1989, ISBN-13: 978-0136868903.

BOS Chairman

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Department of Fashion Technology

AY: 2019-20

Action taken report -Employers Feedback

Date : 11.01.2021

S.No	Analysis	Action taken report
1.	More industrial trips should be arranged. The concept of short term internship, long term internship and OJT [On The Job Training] must be encouraged.	Two industrial trips are provided to the students per semester. Based on the need and importance, more trips are provided.
2.	More digitization and apps need to be developed by students as a course in the curriculum.	Students are exposed to basic electronic components and its working in engineering clinic I and II (U18INI1600 & U18INI2600) along with python programming which helps to do app development.
3.	A balance between theory and practical courses should be taken care in the curriculum.	In the curriculum, more care is taken to provide balance between theory and practical courses.
4.	Faculties must be aligned with the latest trends, techniques, demands and requirements in the market, need of an hour.	Faculty undergo industrial visits and training to update knowledge about current trends in apparels.

Prepared By,

BoS Coordinator

Approved By,

BoS Chairman

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Department of Computer Applications

AY: 2019-20

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	Service Oriented Architecture course can be offered as a core course in embedded mode instead of being offered as an elective course.	P20CAI3201 - Service Oriented Architecture is offered in Embedded mode &the topic Microservices has been included as one unit.
2.	The topic Microservices to be included in Service Oriented Architecture course	
3.	UI component to be included in Web Technologies course	Included in P20CAI2202 Web Technologies course

Prepared By,

BoS Coordinator

Approved By,

BoS Chairman

Proof for Action Taken:

1.

R18 Curriculum with Service Oriented Architecture(P18CAE0001) as an elective subject

KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE – 641 049
REGULATIONS 2018

MCA
CURRICULUM

List of Program Electives

Code No.	Course Title	Course Type	L	T	P	J	C
P18CAE0001	Service Oriented Architecture	PE	3	0	0	0	3
P18CAE0002	Information Security	PE	3	0	0	0	3
P18CAE0003	Object Oriented Analysis and Design	PE	3	0	0	0	3
P18CAE0004	Game Development	PE	3	0	0	0	3
P18CAE0005	Software Project Management	PE	3	0	0	0	3
P18CAE0006	E- Commerce	PE	3	0	0	0	3
P18CAE0007	TCP/IPV6 Protocol Suite	PE	3	0	0	0	3
P18CAE0008	Wireless Networks	PE	3	0	0	0	3
P18CAE0009	Ethics in Computing	PE	3	0	0	0	3
P18CAE0010	Domain Analytics	PE	3	0	0	0	3
P18CAE0011	Artificial Intelligence	PE	3	0	0	0	3
P18CAE0012	Accounting and Financial Management	PE	3	0	0	0	3
P18CAE0013	Enterprise Resource Planning	PE	3	0	0	0	3
P18CAE0014	Managing Technical People	PE	3	0	0	0	3

R20 Curriculum with Service Oriented Architecture(P20CAI3201) as a core subject

REGULATION 2020

MCA CURRICULUM

SEMESTER III							
Course Code	**Course Title**	**Course Mode**	**L**	**T**	**P**	**J**	**C**
P20CAI3201	Service Oriented Architecture	Embedded Theory & lab	3	0	2	0	4
P20CAT3002	Ethics in computing	Theory	3	0	0	0	3
P20CAI3203	Cloud Application Development	Embedded Theory & lab	3	0	2	0	4
P20CAT3004	Artificial Intelligence	Theory	3	0	0	0	3
E-III	Elective III	Theory	3	0	0	0	3
E-IV	Elective IV	Theory	3	0	0	0	3
E -V	Elective V	Theory	3	0	0	0	3
P20CAP3501	Mobile Computing Lab	Lab	0	0	4	0	2
						Total Credits	**25**

2. P20CAI3201 – Syllabus with the topic "Microservices included as one unit.

P20CAI3201	SERVICE ORIENTED ARCHITECTURE	L	T	P	J	C
		3	0	2	0	4

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Get the foundations and concepts of service-based computing.
CO2: Understand service - oriented analysis techniques.
CO3: Understanding the basic operational model of web services.
CO4: Gain the knowledge of key technologies in the service-oriented computing arena.
CO5: Apply and practice the learning through a real or illustrative project/case study.

Pre–requisite : Nil

Cos	PROGRAMME OUTCOMES (POs) (S/M/W Indicates Strength of Correlation) S-Strong, M-Medium, W- Weak											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S			M	M		M					
CO2	M	S		M	W							
CO3	W		S	M	M	M				M		
CO4		W		M	S	M	M					
CO5		S	S	S	S	S						

COURSE ASSESSMENT METHODS

DIRECT

1.Continuous Assessment Test I, II (Theory component)
2.Assignment (Theory component)
3.Demonstration etc (as applicable) (Theory component)
4.Pre/Post - Experiment Test/Viva; Experimental Report for each Experiment (lab Component)
5.Model Examination (lab component)
6.End Semester Examination (Theory and lab components)

INDIRECT

1.Course-end survey

INTRODUCTION — **5 Hours**

SOA and MSA Basics- Service Orientation in Daily Life- Evolution of SOA and MSA- Service oriented Architecture and Microservices architecture – Drivers SOA- Dimensions of SOA- Conceptual Model of SOA- Standards and Guidelines for SOA-Emergence of MSA

SERVICE ORIENTED ARCHITECTURE — **10 Hours**

Enterprise-Wide SOA-Considerations for Enterprise-wide SOA- Strawman Architecture for Enterprise-wide SOA- Enterprise SOA Reference Architecture- Object-oriented Analysis and Design (OOAD) Process- Service oriented Analysis and Design (SOAD) Process - SOA Methodology for Enterprise. Service-Oriented Applications: Considerations for Service-oriented Applications- Patterns for SOA-Patternbased Architecture for Service-oriented Applications -Composite Applications - Programming Model.

3. P20CAI2202 Web Technologies with UI Design added as one unit

P20CAI2202	WEB TECHNOLOGIES	L	T	P	J	C
		3	0	2	0	4

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Create a basic website using HTML and Cascading Style Sheets.
CO2: Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms.
CO3: Design rich client presentation using AJAX.
CO4: Design and implement simple web page to present data in XML format.
CO5: Design front end web page and connect to the back-end databases.

Pre–requisite : Nil

Cos	PROGRAMME OUTCOMES (POs) (S/M/W Indicates Strength of Correlation) S-Strong, M-Medium, W- Weak											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	W	S		S		S					
CO2		M	S		S		S					
CO3	M	W	S		S		S					
CO4		M	S		S		S					
CO5	M		S		S		S					

COURSE ASSESSMENT METHODS

DIRECT

1.Continuous Assessment Test I, II (Theory component)
2.Assignment (Theory component)
3.Demonstration etc (as applicable) (Theory component)
4.Pre/Post - Experiment Test/Viva; Experimental Report for each Experiment (lab Component)
5.Model Examination (lab component)
6.End Semester Examination (Theory and lab components)

INDIRECT

1.Course-end survey

WEB FUNDAMENTALS AND XHTML — **5 Hours**

Web browsers, web servers, MIME, URL, HTTP. Introduction to XHTML5 tags, Basic syntax and structure, text markups, images, lists, tables, Media tags-audio and video, forms, frames.

UI DESIGN — **10 Hours**

Markup Language (HTML5): Basics of Html -Syntax and Tags of Html- Introduction to HTML5 -Semantic/Structural Elements -HTML5 Style Guide and Coding Convention– Html Svg and Canvas – Html API"s - Audio & Video - Drag/Drop - Local Storage - Web Socket API– Debugging and Validating Html.

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Department of Mechanical Engineering

AY: 2019 - 20 **Date: 11 – 01 – 2021**

Employers Feedback

1. Industrial nominee suggested to offer the courses in a connected manner.
2. Industrial nominee suggested to include industrial case studies in the curriculum wherever possible.

Prepared By,

Dr.B.Senthilkumar

BoS Coordinator

Approved By,

Dr.C.Velmurugan

BoS Chairman

Dr. C. VELMURUGAN, M.E.,Ph.D.
Professor & Head
Department of Mechanical Engineering
Kumaraguru College of Technology
Coimbatore - 641 049.

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Department of Mechanical Engineering

AY: 2019 - 2020 **Date: 11 – 01 – 2021**

Employers Feedback Analysis Report

1. Industrial nominee suggested to offer the courses in a connected manner – This issue was addressed in the meeting itself that prerequisites mentioned in the curriculum and syllabus. In future also this suggestion will be taken into account with industrial requirements.
2. Industrial nominee suggested to include industrial case studies in the curriculum wherever possible – Department insists internships during the summer and winter vacations to have practical exposure on the challenges faced in the industrial environment.

Prepared By,

Dr.B. Senthilkumar

BoS Coordinator

Approved By,

Dr.C.Velmurugan

BoS Chairman

Dr. C. VELMURUGAN, M.E.,Ph.D.
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Department of Mechanical Engineering

AY: 2019 - 20 **Date: 11 – 01 – 2021**

Action taken report -Employers Feedback

S.No	Analysis	Action taken report
1.	Industrial nominee suggested to offer the courses in a connected manner	The details were updated in the meeting itself that each course is prescribed with pre-requisites. Also, domain specific electives are already grouped together to enable the student to specialise in a particular domain (namely Design, Thermal, Manufacturing and Industrial Engineering).
2.	Industrial nominee suggested to include industrial case studies in the curriculum wherever possible.	The department has entered MoU with 14 Industries for the purpose of industrial internships, research and consultancy.

Prepared By,

Dr.B.Senthilkumar

BoS Coordinator

Approved By,

Dr.C.Velmurugan

BoS Chairman

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Department of Mechatronics Engineering

Date:(10.12.20)

AY: 2019-20

Action taken report Employer's Feedback

S.No	Analysis	Action taken report
1.	U18MCI6202- Robotics Engineering a) Motion control - 11 hrs to be reduced. b) Laplace, PD and PID Control to be removed. c)ROS tools to be included in robot programming.	Recommended changes are incorporated in U18MCI6202- Robotics Engineering
2.	U17MCT7001/U18MCT7001 - Autonomous Vehicle a) Title should be changed as Mobile Robotics b) Sensor topic to be removed (since it is repeated in another course of this semester) c)Aerial robotics related topics can be included	Recommended changes are incorporated in U17MCT7001/ U18MCT7001
3.	U17MCT7002/U18MCT7002 - Image processing and computer vision a) Camera, lighting, Graphics card to be added as application topics.	Added in the content in U17MCT7002/U18MCT7002

Prepared By,

BoS Coordinator

Approved By,

BoS Chairman

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Department of Mechatronics Engineering

AY: 2019-20 **Date: (11.01.21)**

Action taken report Employer's Feedback(Proof)

Proof 1:

Introduction- Differential motions of a frame – Jacobian – Singularities – Lagrangian and Newton-Euler formulations – Basics of Trajectory Planning
ROBOT MOTION PLANNING AND ROBOT INTERFACES **5 Hours**
Robot Motion Planning: Cartesian Space vs Configuration space, Introduction to motion planning algorithms. Robot interfaces: Low level interfaces, IO digital signals, Fieldbuses – Data protocols and connections
END EFFECTORS **4 Hours**
End effectors and Different types of grippers, vacuum and other methods of gripping - Grippers force analysis-Gripper Design-Simple problems
ROBOT PROGRAMMING **10 Hours**
Robot programming: Introduction; On-line programming: Manual input, lead through programming, teach pendant programming; Off-line programming languages – Simulation. Introduction to Robotic operating System (ROS) – Visualization using RViz, Moving the robot in Gazebo, Manipulation with MoveIt. - Simulation.
Theory:45 Hrs. Practical:30Hrs Total Hours:75
REFERENCES:
1. Saeed B Niku, 'Introduction to Robotics', 2nd edition, Prentice Hall of India,2011.
2. Mikell P Groover, "Industrial Robots - Technology, Programming and Applications", McGraw Hill, New York, 2008.
3. Norberto Pires, 'Industrial Robots programming: Building Applications for the Factories of the Future', 1st edition, Springer,2012
4. Nagrath and Mittal, "Robotics and Control", Tata McGraw-Hill,2003.
5. Spong and Vidhya sagar, "Robot Dynamics and Control", John Wiley and sons,2008.
6. Fu K S, Gonzalez R C, Lee C S G, "Robotics, control, sensing, Vision and Intelligence", McGraw Hill International,1987
7. Steve LaValle, "Planning Algorithms", Cambridge Univ. Press, New York,2006.
8. Howie Choset, Kevin Lynch, Seth Hutchinson, George Kantor, Wolfram Burgard, Lydia Kavraki and Sebastian Thurn, "Principles of Robot Motion: Theory, Algorithms, and Implementations", Prentice Hall of India,2005.
9. Anil Mahtani, Luis Sanchez, Enrique Fernandez, Aaron Martinez, 'Effective Robotics Programming with ROS', 3rd Edition, Packt,2016.
LIST OF EXPERIMENT:
1. Study of different type of robotics simulation software
2. Modeling forward and inverse kinematics for robotic arm using Mathematical Software
3. Offline programming of an Industrial robot using a Robotics simulation Software
4. Setup and program a robot with object profile tracking using a Robotics simulation Software
5. Develop a trajectory planning for a robot using a simulation software.
6. Setup and program an Industrial Robot with a pneumatic vacuum gripper for a simple pick and place operation
7. Writing and verifying a Program for point to point operations
8. Robot programming and simulation for Shape identification
9. Setup and Program a robot to avoid obstacles
10. Robot Simulation using Robot Operating System (ROS) and Gazebo

U18MCT7001	MOBILE ROBOTICS	L	T	P	J	C
		3	0	0	0	3

Course Outcomes

MOBILE ROBOT LOCALIZATION	9 Hours
Introduction to localization – challenges in localization – localization and navigation – belief representation – map representation – probabilistic map-based localization – Markov localization, Kalman localization.	
PATH PLANNING AND NAVIGATION	**9 Hours**
Introduction to planning and navigation – planning and reacting – path planning algorithms based on A-star, Dijkstra, Voronoi diagrams – obstacle avoidance techniques	
Theory:45Hours	**Total Hours: 45**
REFERENCES:	

Proof 3:

vision , 2D view based representations of a 3D scene

APPLICATIONS	9 Hours
Industrial automation and quality inspection, Object detection; Gesture Recognition; Finger print recognition, Vision for robot control-Selection of camera based on applications.	
Theory:45Hrs	**Total Hours:45**