13th April 2019

Agenda

Sl.No	Points to discuss	Documents
1.	Introduction & Review of Actions initiated from previous BOS meeting	
2.	Review of modifications recommended by the Academic Council or the Principal after BOS 2019.	
3.	General Points	
4.	Review and approval of Syllabi for VII & VIII Semester of the batch 2016-20 , KLE Tech.	**Curriculum structure & Syllabus**
5.	Review and approval of Syllabi for V & VI Semester of the batch 2017-21 , KLE Tech.	
6.	Review and approval of Syllabi for III & IV Semester of the batch 2018-22 , KLE Tech.	
7.	Other points	

Minutes Prepared by

Jyoti Bali

Prof. A. C. Giriyapur

Chairperson, HOD, A&R

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Sl.No	Points raised	Changes made	Raised By
1.0 General points	- HOD welcomed members of Fourth BOS-2019 for KLE Tech - Reviewed the minutes of BOS 2018. - Review of modifications recommended by the Academic Council or the Principal after BOS 2018. - Reviewed the verticals of the department. - Reviewed the curriculum structure and credit distribution. - Discussed about final year project/internship/industry internship. - Involved project based learning in theory and lab courses. - A & R department established Center for Automation Systems Engineering consultancy. - All BOS documents should have page numbers. - Briefing of Students achievements - Participation of Student Team on Delta Robot exhibited at FIESTA-2018 in South Korea - Student Participation in Robocon-2019 at Pune. - Development of Basic version of Humanoid Robot under capstone project - Projects problems taken up for VRL Transport Company.	Review done and action planned	Dr. Dhanesh Manik, IIT Bombay. Mr. Abhijit Lele Robert Bosch India. Mr. Sachinkumar Gorlewar Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.
2.0 Curriculum & Syllabus	**Review of Syllabi for III & IV Semester of the batch 2018-22, KLE Tech.** - Suggested to Combine Machine Drawing and Manufacturing Lab. Course content related to Machine drawing and Manufacturing lab to be proposed and sent to external BOS members for approval. IP Protections can be included in Machine Drawing lab. - Suggested changes in the course content of Microcontrollers to be proposed and sent to external	Review done and action planned	Dr. Dhanesh Manik, IIT Bombay. Mr. Abhijit Lele Robert Bosch India. Mr. Sachinkumar Gorlewar Mr. Supreet Kamatagi,

	BOS members for approval. • Reviewed and approved the course content of Kinematics and Dynamics of Machinery theory and Lab. • Suggested changes in the course content of Real Time Embedded system to be proposed and sent to external BOS members for approval. Suggested to change the approach of delivery in the course of Real Time Embedded system.		Griffyn Robotech Pvt. Ltd.
3.0	• **Review of Syllabi for V & VI Semester of the batch 2017-21, KLE Tech.** • Object Oriented Programming & Database Management Systems 17EARC301 (50 hours): The course was newly created to support the previously offered OOP & Python Practice (16EARP305) and DBMS Practice (16EARP306). The new course included Java programming, Python programming and MySQL database. Overall, 50 hours of content was newly created.	Review done and action planned	Dr. Dhanesh Manik, IIT Bombay. Mr. Abhijit Lele Robert Bosch India Mr. Sachinkumar Gorlewar Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.
4.0	• **Summary of changes proposed in different courses** **Batch 2016-20, VII Sem** **Machine Learning and ROS 16EARE403 (40 hours)** Topics related to Robot operating system[5 hours]: messages, classes, and servers[5 hours] were introduced and topics related to machine learning[5hours], computational learning theory[4hours], decision tree[4 hours], kernel methods[7 hours], reinforcement learning[5hours], and ANN[5 hours] were added. **Measurement System 16EARE401 (40 hours)** Measurement as an elective has been introduced for the academic year based on the inputs of the department committee and topics added are -.Chapter1. Introduction to Measurement Systems (5 hrs), Chapter No. 2. Sensors and Signal conditioning (5 hrs), Chapter No. 3. Motion Measurement (5 hrs), Chapter No. 4. Force, Torque, and Shaft Power Measurement(5 hrs), Chapter No. 5. Pressure &	Review done and action planned	Dr. Dhanesh Manik, IIT Bombay. Mr. Abhijit Lele Robert Bosch India Mr. Sachinkumar Gorlewar Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.

Sound Measurement(5 hrs), Chapter No. 6. Flow and Temperature Measurement(5 hrs), Chapter No.7. Data Acquisition Systems(5 hrs), Chapter No. 8. Transmission and Recording of Data(5 hrs).

Batch 2017-21 , V Sem
Measurement System 17EARC304 (40 hours)
Chapter No. 1. Introduction to Measurement Systems (5 hrs), Chapter No. 2. Sensors and Signal conditioning (5 hrs), Chapter No. 3. Motion Measurement (5 hrs), Chapter No. 4. Force, Torque, and Shaft Power Measurement(5 hrs), Chapter No. 5. Pressure & Sound Measurement(5 hrs), Chapter No. 6. Flow and Temperature Measurement(5 hrs), Chapter No.7. Data Acquisition Systems(5 hrs), Chapter No. 8. Transmission and Recording of Data(5 hrs).

Mechatronics and Measurement Lab 17EARP303-12 hours
Exercise on Sensors and Sensor Modeling-4 hrs , Exercise on Transfer Functions & Model based design- 4hrs, Exercise on System Identification and Parametrization :4hrs

Machine Learning & ROS 17EARC305 (40 hours)
Topics related to the Robotic operating system were added-ROS services, ROS messages, ROS publisher and subscriber and various simulation tools were added. Chapter 1:Introduction to Robot operating system [5hrs],Chapter 2:Messages, Classes and Servers in ROS[5hrs], Chapter 3: Introduction to machine learning [5hrs],Chapter 4: Computational learning theory and decision tree learning[8hrs],Chapter 5:Kernel methods and Graphical models[7hrs],Chapter 6:Reinforcement Learning[5hrs],Chapter 7: Artificial neural network[5hrs]

Object Oriented Programming & Database Management Systems 17EARC301 (50 hours)
The course was newly created to support the previously offered OOP & Python Practice (16EARP305) and DBMS Practice (16EARP306). The new course included Java programming, Python programming and MySQL database. Overall, 50 hours of content was newly created. Chapter 1: Introduction to Software Development Lifecycle and Unified Modeling Language (6 hrs), Chapter 2: Data Modeling using the ER Model (6 hrs), Chapter 3: Introduction to Object-

Dr. Dhanesh Manik, IIT Bombay.

Mr. Abhijit Lele Robert Bosch India

Mr. Sachinkumar Gorlewar

Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.

Oriented Programming - I (8 hrs), Chapter 4: Object-Oriented Programming - II (4 hrs), Chapter 5: Object-Oriented Programming - III (10 hrs), Chapter 6: Introduction to Database Management Systems (6 hrs), Chapter 7: Relational Data Model (5 hrs) and SQL and Chapter 8: Object-Relational Databases and Semantic Modeling Approach (5 hrs)

Mechatronics System Design 17EARC303 (20 hours)
Introduced additional topics under : System Modeling : 5 hrs, Electric Drives- 10 hrs, Model based design of Systems and Identification and Case studies -5hrs

Object Oriented Programming & Database Management Systems Lab 17EARP301 (24 hours)
The lab was newly created to complement the new course on Object Oriented Programming & Database Management Systems (17EARC306). The lab focused on Java programming, Python programming and MySQL database with emphasis on industry relevant context. Overall, 7 experiments or 13 lab sessions were introduced.

Batch 2017-21 , VI Sem

AI for Autonomous Robots 17EARE301 (40 hours)
Topics related robotics paradigms ,robotic architectures- Hierarchical paradigm,reactive paradigm and deliberative paradigm ,animal models based algorithms,multi agents and navigation and localizations methods were added under the chapters- 1: Introduction to Artificial intelligence and autonomous systems [5hrs],Chapter 2: Robotic software architectures[5hrs],Chapter 3: Biological Foundations of the Reactive Paradigm,Chapter 4: Capturing intelligence - Designing a reactive implementation with common sensing techniques for robotics perception[8hrs],Chapter 5: Multi-agents and navigation in robotics[7hrs],Chapter 6:Localization and Map Making[6hrs],Chapter 7: Deep learning and natural language processing[4hrs]

Digital System Design and FPGA Programming 17EARE304 (40 hours)
Chapter 1. Review of Logic Design Fundamentals: 9 hours, Chapter 2. Introduction to State Machine Charts and

Dr. Dhanesh Manik, IIT Bombay.

Mr. Abhijit Lele Robert Bosch India

Mr. Sachinkumar Gorlewar

Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.

Microprogramming: 6hrs,Chapter 3. Designing with Field Programmable Gate Arrays: Chapter 4. Modeling and design with HDL -8 hrs,Chapter 5. Testing and Verification-5 hrs,Case studies on FPGA technologies in Automation and Robotics applications -5 hrs **Hydraulics and Pneumatics 17EARC308 (10 hours).** Topics related to Hydraulic System Maintenance (5 hours) and few topics related to hydraulics control system (5 hours) were not included in the syllabus. **Industrial Robotics Lab 17EARP306 (12 hours)** Robotics Toolbox by peter corke was added to solve problems on orientation and pose in 2D and 3D (SO (2), SE (2), SO (3), SE (3)) as matrices, quaternions, twists, triple angles, and matrix exponentials. RoboAnalyzer tool was introduced in the lab to perform kinematic analysis of industrial robots (4 - DOF, and 6 DOF), Forward and Inverse kinematics analysis, Transformation matrix (2D and 3D), Path generation and building custom robots. Topics regarding Reachability and Multimove by using Robotstudio were added. **2018-22 batch, III Sem** **Analog and Digital Electronics 18EARC201 (12 hours)** **Data conversions - 6hours, Digital integrated circuits - 6hrs** Data Structures, Algorithm Design and Analysis 18EARC203. (12 hours) Topics related to C++ programming were added-class and objects, abstractions, polymorphism, encapsulation and inheritance ,types of inheritance under the chapters Chapter 6: Introduction to C++[6 hrs],Chapter 7: Basic oopS concepts [6 hrs] **2018-22 batch, IV Sem** **Object Oriented Programming & Database Management Systems 18EARC209 (20 hours)** Course was shifted to IV semester as courses from V semester onwards required proficiency in programming.	Dr. Dhanesh Manik, IIT Bombay. Mr. Abhijit Lele Robert Bosch India Mr. Sachinkumar Gorlewar Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.	

Additionally, the number of programming languages were reduced with focus solely on classical OOP and databases. This required deletion of Chapter 5: Object Oriented Programming-III (10 hrs), Chapter 7: Relational Data Model and SQL (5 hrs) and Chapter 8: Object-Relational Databases and Semantic Modeling Approach (5 hrs). The deletion of some DBMS content was shifted to the lab with a more hands-on approach, and some to Chapter 5: Entity Relationship (ER) Model (3 hrs) and Chapter 6: Database Management System (2 hrs). Also, the content was adjusted to teach classical OOP instead of java specific, and introduced the concepts of cloud computing as part of Chapter 7: Cloud Computing (5 hrs).

Object Oriented Programming & Database Management Systems Lab 18EARP209 (24 hours)

Python related experiments and Java related experiments (3 labs or 6 hours) were adapted to work on experiments related to classical OOP. The lab experiments were enhanced to include additional experiments on classical OOP, file handling and user interfaces.

Microcontrollers Programming and Interfacing 18EARC208 (12 hours)
Exposure to advanced microcontrollers [2 hours], the topics related to STmicroelectronics microcontrollers [5 hours] and programming using timers and interrupts [5 hours] were added.

Control Systems 18EARC207 (12 hours)
Root Locus: Incorporation of Performance Specifications in Controller Design, Analysis of Steady State Errors, Root Locus and its Application in Control Design. (3 hrs) , Case Studies of control systems were introduced. Some important case studies are on Plants for Pressure Control, Electromechanical Plants, Modeling and design of Inverted Pendulum, Modeling and design of Aircraft. (5 hrs)
Controllers – Proportional (P), Integral (I) and Derivative (D) Blocks, Examples of PID controller design, Problems. (4 hrs)

Microcontrollers Programming and Interfacing Lab 18EARP208 SD (8 hours)

Dr. Dhanesh Manik, IIT Bombay.

Mr. Abhijit Lele Robert Bosch India

Mr. Sachinkumar Gorlewar

Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.

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	Experiments related to development of IOT systems[3 hours], interrupt programming with STM MCU [2 hours], and development of applications using STM MCU to predict the data using the existing trained module[3 hours] were introduced.		

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Changes made in Curriculum Content for III and IV Semester of batch 2018-22, IV & V Semester of the batch 2017-21, VII & VIII Semester of the batch 2016-20, in IV BOS held in Mechanical Library on 13th April 2019.

Approved by:

Sl No	Members, BOS	Signature
1	Prof. A. C. Giriyapur, Chairperson, HOD, A & R Dept.	
2	Dr. Dhanesh Manik, IIT Bombay.	
3	Mr. Abhijit Lele, Robert Bosch India.	
4	Mr. Sachinkumar Gorlewar, Griffyn Robotech Pvt. Ltd.	
5	Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.	
6	Mrs. Jyoti Bali, A & R Dept.	
7	Mr. Vinod Kumar V Meti, A & R Dept.	
8	Mr. Nagaraj M B, A & R Dept.	
9	Mr. Sachin Karadgi, A & R Dept.	

Resolutions Made During the 4th Board of Studies Meeting held on 13th April 2019 in Mechanical Library.

1. Resolved to approve Syllabi for III and IV Semester of batch 2018-22, KLE Tech., as per the changes suggested by external and internal members.

2. Resolved to approve Syllabi for V & VI Semester of the batch 2017-21, KLE Tech., as per the changes suggested by external and internal members.

3. Resolved to approve Syllabi for VII & VIII Semester of the batch 2016-20, KLE Tech., as per the changes suggested by external and internal members.
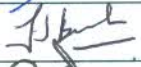
Changes made in the Curriculum Content for III and IV Semester of the batch 2018-22, V & VI Semester of the batch 2017-21, VII & VIII Semester of the batch 2016-20, in 4th BOS held in Mechanical Library on 13th April 2019.

The suggested changes in the content of all the courses and laboratories discussed in the BOS meeting are attached with this document.

Approved by:

Sl No	Members, BOS	Signature
1	Prof. A. C. Giriyapur, Chairperson, HOD, A & R Dept.	
2	Dr. Dhanesh Manik, IIT Bombay.	
3	Mr. Abhijit Lele, Robert Bosch India.	
4	Mr. Sachinkumar Gorlewar, Griffyn Robotech Pvt. Ltd.	
5	Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.	
6	Mrs. Jyoti Bali, A & R Dept.	
7	Mr. Vinod Kumar V Meti, A & R Dept.	
8	Mr. Nagaraj M B, A & R Dept.	
9	Mr. Sachin Karadgi, A & R Dept.	

KLE Technological University

KLE TECH.

Creating Value
Leveraging Knowledge

Department of Automation & Robotics
Structure of Board of Studies 2019-20, 13th April 2019

S. No.	Category	Nomination of the Committee		Name of the Person	Signature
1	Concerned Head of the Department/ School/ Center	Chairperson	1	Arunkumar C Giriyapur	
2	ONE Professor, ONE Associate Professor and ONE Assistant Professor from the Department/ School/ Center, nominated by the Dean Academic Affairs	Members		Mrs Jyoti Bali	
				Mr. Vinod Kumar V Meti	
				Mr. Nagaraj.M.B	
				Mr.Sachin Karadgi	
3	ONE PG Coordinator for each of the PG programmes offered by the Department/ School/ Center	Member(s)	1		
			2		
3	TWO Subject experts from outside the college nominated by the Vice-Chancellor	Members	1	Dr. Dhanesh Manik, IIT Bombay.	
			2		
4	TWO representative from industry corporate sector/ allied area relating to placement nominated by the Vice-Chancellor	Members	1	Mr. Abhijit Lele, Robert Bosch India.	A.M. lele
			2	Mr. Sachinkumar Gorlewar, Griffyn Robotech Pvt. Ltd.	
5	ONE Post-graduate meritorious alumnus nominated by the Vice-Chancellor	Member	1	Mr. Supreet Kamatagi	
6	ONE Student Member representing each of the program offered by the Department/ School/ Center	Invited Member	1	UG Student (Not Applicable at present)	
			2	PG Student (Not Applicable at present)	
			3	PhD Student (Not Applicable at present)	

The concerned Chairman of Board of Studies may invite additional experts to the Departmental Board of Studies as deemed fit.

A Departmental Board of Studies shall:
Meet at least once a year, sufficiently before the commencement;
Prepare detailed curricula and syllabi of concerned Programmes and submit to the Academic Council for approval and publication; and
Revise the curricula and syllabi from time to time and submit to the Academic Council for approval and publication

Semester 2018-22 Batch

	III	IV	V	VI	VII	VIII
C O U R S E W I T H C O U R S E C O D E	Statistics And Integral Transforms	Numerical Methods and Partial differential equations	Robot analysis & design	Realtime Embedded Systems	Industrial Data Networks	Department Elective-6
	Calculus And Integral Transforms	Vector calculus and differential	Mechatronics System Design	Programming Industrial Automation Systems	Department Elective-3	Open Elective
	Analog & Digital Electronic Circuits	Kinematics Of Machinery	Microcontrollers	Department Elective-1	Department Elective-4	Project
	Mechanics Of Materials	Control Systems	Artificial Intelligence & Machine Learning	Department Elective-2	Department Elective-5	Internship
	Algorithm Analysis And Program Design	Machine Design	Hydraulics & Pneumatics	PA & LR	Open Elective	Industry Internship - Project Work
	Manufacturing Technology	Measurement systems	Microcontroller Lab	Automation Lab	CIPE	
	Analog And Digital Electronic Lab	Object Oriented System Design	Robotics Lab	Hydraulics And Pneumatics Lab		
	Machine Drawing & Manufacturing Technology Lab	OOSD Lab	Mechatronics & Measurements Lab	Realtime Embedded Systems Lab		
		Kinematics Lab	Mini Project (Engineering Design Practice)	Minor project		

Approved by (Use Initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	*Dhanesh Man*	*A.M.Lele*							

Semester 2017-21 Batch

	III	IV	V	VI	VII	VIII
Course with course code	Statistics And Integral Transforms	Numerical Methods and Partial differential equations	Robot analysis & design	Hydraulics & Pneumatics	Industrial Data Networks	Department Elective-6
	Calculus And Integral Transforms	Vector calculus and differential	Mechatronics System Design	Realtime Embedded Systems	Department Elective -3	Open Elective
	Analog & Digital Electronic Circuits	Kinematics Of Machinery	Programming Industrial Automation Systems	Department Elective -1	Department Elective -4	Project
	Mechanics Of Materials	Microcontrollers	Robotics Lab	Department Elective -2	Department Elective -5	Internship
	Algorithm Analysis And Program Design	Control Systems	Mechatronics & Measurement Lab	Hydraulics And Pneumatics Lab	Open Elective	Industry Internship - Project Work
	Machine Design	Manufacturing Technology	Automation Lab	Realtime Embedded Systems Lab	CIPE	
	Analog And Digital Electronic Circuits Lab	Manufacturing & Metrology lab	Measurements	Artificial Intelligence & Machine Learning		
	Machine Drawing Lab	Kinematics Lab	Object Oriented System Design	Minor project		
	Programming Lab	Microcontroller Lab	OOSD Lab	PA & LR		
			Engineering Design (Mini project)			

Approved by (Use Initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	Dhanan Ma	A.M.lele		Gkamati		J.sb	Vinod		Sachna k

Semester 2016-20 Batch

	III	IV	V	VI	VII	VIII
Course with course code	Statistics and integral transforms	Numerical Methods and partial differential equations	Robot analysis & design	Hydraulics & Pneumatics	Industrial Data Networks	Department Elective -6
	Calculus and integral transforms	Vector calculus and differential				
	Analog & Digital Electronic circuits	Kinematics of Machinery	Mechatronics System Design	Real Time Embedded Systems	Department Elective -3	Open Elective
	Mechanics of Materials	Microcontrollers	Programming Industrial Automation Systems	Department Elective -1	Department Elective -4	Project
	Manufacturing Technology	Machine Design	Robotics Lab	Department Elective -2	Department Elective -5	Internship
	Algorithm analysis & program design	Control systems	Mechatronics Lab	Hydraulics & Pneumatics Lab	Open Elective	Industry Internship - Project Work
	Engineering Design	Manufacturing & Metrology lab	Automation Lab	Real Time Embedded Systems Lab	CIPE	
	Analog & Digital electronics lab	Kinematics lab	OOP & Python Practice	Minor project		
	Programming Lab	Microcontroller Lab	DBMS Practice	PA & LR		
		Product Realization	Mini project			

Approved by (Use Initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	*Dhanesh Man*	*A.M.Lele*	*[signature]*	*Komatgi*	*[signature]*	*J.Sbali*	*[signature]*	*[signature]*	*Sachin K*

	FORM ISO 9001: 2015- KLE TECH Department of Automation & Robotics	Document #: FMCD2007	Rev: 1.0
Title: Verification-Curriculum Design and Development 2016- 20 Batch		Page : of 1	
		Year:2019	

Sr.No	Agenda	Inputs from members	Decisions	Verification status		
				A	AMC	NA
1	**Overall schemes of the program**					
a	Credits	Verified for different subject	Found satisfactory.		✓	
b	Flow	Changes specified for few subject	change was approved.		✓	
c	Contact hours	Verified	Found ok		✓	
2	**Semester wise curriculum structure**					
a	Credits	Verified	Found ok, satisfactory		✓	
b	Flow	Minor changes incorporated.	Found ok accepted		✓	
c	Contact hours	Verified	Found Ok. accepted		✓	
d	Evaluation scheme	Verified	Accepted!		✓	
3	**Course contents**					
a	Subject contents	Suggested changes	Approved with incorporated changes		✓	
b	Unitization	Verified	Found ok.		✓	
c	Reference books	Verified for specific subjects	Approved. with changes.		✓	
d	Evaluation method	Verified	Found satisfactory		✓	

Verified by(Use Initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	Dhanesh Mai	A.M.lele		Karagi		JSBali	Vinod		Sachin

	FORM		Document #: FMCD2007		
KLE TECH.	ISO 9001: 2015- KLE TECH			**Rev: 1.0**	
	Department of Automation & Robotics				
Title: Verification-Curriculum Design and Development				**Page : of 1**	
2017- 21 Batch				**Year:2019**	

Sr.No	Agenda	Inputs from members	Decisions	Verification status		
				A	AMC	NA
1	**Overall schemes of the program**					
a	Credits	Suggested charges, incorporated	Found satisfactory		✓	
b	Flow	Minor charges incorporated	Accepted.		✓	
c	Contact hours	Verified	Found ok, Accepted		✓	
2	**Semester wise curriculum structure**					
a	Credits	Minor charges incorporated	Found satisfactory.		✓	
b	Flow	Verified 4 suggested few changes	Accepted		✓	
c	Contact hours	Verified	Found ok Accepted.		✓	
d	Evaluation scheme	Verified	Found ok. Accepted		✓	
3	**Course contents**					
a	Subject contents	Verified few charges suggested	Found ok		✓	
b	Unitization	Verified and	Accepted.		✓	
c	Reference books	Added few text books	Accepted		✓	
d	Evaluation method	Verified	Found ok.		✓	

Verified by(Use Initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	Dhanesh Mai	A.M.lele				J.Bali			

Sr.No	Agenda	Inputs from members	Decisions	Verification status		
				A	AMC	NA
1	**Overall schemes of the program**					
a	Credits	Suggested changes in some subjects	Verified & Accepted.		✓	
b	Flow	Verified for few core subjects	Found Ok Accepted		✓	
c	Contact hours	Verified for few subjects	Accepted.		✓	
2	**Semester wise curriculum structure**					
a	Credits	Verified	Found Ok. Satisfactory		✓	
b	Flow	Minor changes suggested	Found Ok. Accepted		✓	
c	Contact hours	Verified	Accepted		✓	
d	Evaluation scheme	Verified	Accepted with minor change		✓	
3	**Course contents**					
a	Subject contents	Verified for some subjects	Accepted with incorporated change		✓	
b	Unitization	Verified	Found Ok.		✓	
c	Reference books	Verified for specific subjects	Approved with changes		✓	
d	Evaluation method	Verified	Found satisfactory		✓	

Verified by(Use Initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	*signature*	A.M.lele	*signature*	*signature*	*signature*	JSBali	*signature*	*signature*	*signature*

	FORM ISO 9001: 2015- KLE TECH Department of Automation & Robotics	Document #: FMCD2006	Rev: 1.0
Review-Curriculum Design and Development		Page 1 of 1	
		Year:	

Semester: VII (2016-20 batch)   Date of Review: 13-04-2019

Inputs for review: PEO- Mapping of CLO with PO – Academic Guidelines-Previous review outcomes

Sr.No	Features reviewed	Status of Review		
		Accepted	Accepted with minor changes	Not accepted
01	**Overall schemes of the program**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓ .	
02	**Semester wise curriculum structure**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
d	Evaluation scheme	✓		
03	**Course contents**			
a	Subject contents		✓	
b	Unitization		✓	
c	Reference books		✓ .	
d	Evaluation method		✓	

Changes Suggested (Serial number wise)
1. Syllabus content of IDN, Advanced MCU & CIM, Measurement s/ms. verified after changes.
2. Added Reference books for some subjects like Measurement s/m.
3. Review of elective subjects done and suggested modifications

Reviewed by (Use initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	Dhanesh Manik	AM.lele	*(signature)*	*(signature)*	*(signature)*	JJBali	*(signature)*	*(signature)*	Sachin

Semester: VIII (2016-20 batch)   Date of Review: 13-04-2019

Inputs for review: PEO- Mapping of CLO with PO – Academic Guidelines-Previous review outcomes
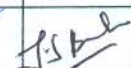
Sr.No	Features reviewed	Status of Review		
		Accepted	Accepted with minor changes	Not accepted
01	**Overall schemes of the program**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
02	**Semester wise curriculum structure**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
d	Evaluation scheme	✓		
03	**Course contents**			
a	Subject contents		✓	
b	Unitization		✓	
c	Reference books		✓	
d	Evaluation method		✓	

Changes Suggested (Serial number wise)	
1)	Verified syllabus of Computer Integrated Manufacturing and suggested changes
2)	Verified the prescribed books for each of the subject and added few books.

Reviewed by (Use initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	*[signature]*	A M.lele	*[signature]*	*[signature]*	*[signature]*	*[signature]*	*[signature]*	*[signature]*	*[signature]*

Semester: V (2017-21 batch)   Date of Review: 13-04-2019

Inputs for review: PEO- Mapping of CLO with PO – Academic Guidelines-Previous review outcomes

Sr.No	Features reviewed	Status of Review		
		Accepted	Accepted with minor changes	Not accepted
01	**Overall schemes of the program**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
02	**Semester wise curriculum structure**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
d	Evaluation scheme	✓		
03	**Course contents**			
a	Subject contents		✓	
b	Unitization		✓	
c	Reference books		✓	
d	Evaluation method	✓		

Changes Suggested (Serial number wise)
1. Changes specified in Robot analysis & Design, PJAS MSD.
2. Changes in the delivery of Robotics lab. suggested
3. Changes proposed in Measurements / Mechatronics Lab accepted.

Reviewed by (Use initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	*Dhanesh rai*	A.M.lele	*sign*	*sign*	*sign*	*sign*	*sign*	*sign*	*sign*

Semester: VI (2017-21 batch)

Date of Review: 13-04-2019

Inputs for review: PEO- Mapping of CLO with PO – Academic Guidelines-Previous review outcomes

Sr.No	Features reviewed	Status of Review		
		Accepted	Accepted with minor changes	Not accepted
01	Overall schemes of the program			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
02	Semester wise curriculum structure			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
d	Evaluation scheme	✓		
03	Course contents			
a	Subject contents		✓	
b	Unitization		✓	
c	Reference books		✓	
d	Evaluation method	✓		

Changes Suggested (Serial number wise)	
1)	Changes proposed is course content of Artificial intelligence and Machine learning
2)	Suggested to change the course as two different subjects to justify the content prescribed one as Core course and other as Elective

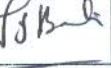| Reviewed by (Use initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	Dhanu Man	A.M.lele							
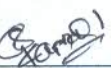
Semester: III (2018-22 batch)   Date of Review:13-04-2019

Inputs for review: PEO- Mapping of CLO with PO – Academic Guidelines-Previous review outcomes

Sr.No	Features reviewed	Status of Review		
		Accepted	Accepted with minor changes	Not accepted
01	**Overall schemes of the program**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
02	**Semester wise curriculum structure**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
d	Evaluation scheme	✓		
03	**Course contents**			
a	Subject contents		✓	
b	Unitization		✓	
c	Reference books		✓	
d	Evaluation method	✓		

Changes Suggested (Serial number wise)
1. Proposed to combine Machine DWG & Manufacturing Lab.
2. Reviewed the course content of Microcontroller and proposed changes
3. Reviewed the entire syllabus of Kinematics & Dynamics of Machinery & approved.
4. changes in the delivery of RIES approved.

Reviewed by (Use initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	*Dhanesh Ma*	AM.lclc	*[sig]*	*[sig]*	*[sig]*	*J.Bali*	*[sig]*	*[sig]*	*[sig]*

Semester: IV (2018-22 batch) Date of Review:13-04-2019

Inputs for review: PEO- Mapping of CLO with PO – Academic Guidelines-Previous review outcomes

Sr.No	Features reviewed	Status of Review		
		Accepted	Accepted with minor changes	Not accepted
01	**Overall schemes of the program**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
02	**Semester wise curriculum structure**			
a	Credits		✓	
b	Flow		✓	
c	Contact hours		✓	
d	Evaluation scheme	✓		
03	**Course contents**			
a	Subject contents		✓	
b	Unitization		✓	
c	Reference books		✓	
d	Evaluation method	✓		

Changes Suggested (Serial number wise)	
1.	Reviewed the course content of Microcontroller and Real time Embedded Systems.
2.	Emphasis on case study discussion was stressed by external members.

Reviewed by (Use initials)	DR. Dhanesh Manik	Mr. Abhijit Lele	Mr. Sachinkumar	Supreet Kamatagi	A.C.Giriyapur	Jyoti Bali	Vinod Meti	Nagaraj MB	Sachin Karadgi
Signature	*Dhanesh Manik*	A.M.lele							

3rd June 2020

Agenda

Sl.No	Points to discuss	Documents
1.	Introduction & Review of Actions initiated from previous BOS meeting	
2.	Review of modifications recommended by the Academic Council after BOS 2019.	
3.	Review and approval of Syllabi for VII & VIII Semester of the batch 2017-21 , KLE Tech.	**Curriculum structure & Syllabus**
4.	Review and approval of Syllabi for V & VI Semester of the batch 2018-22 , KLE Tech.	
5.	Review and approval of Syllabi for III & IV Semester of the batch 2019-23 , KLE Tech.	
6.	Other points	

Minutes Prepared by

Dr. Jyoti Bali

Prof. A. C. Giriyapur

Chairperson, HOD, A&R

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Sl.No	Points raised	Changes made	Raised By
1.0	• HOD welcomed the members of fifth meeting of Board of Studies-2020 (BOS-2020) for KLE Technological University. • Reviewed the verticals of the department. • Reviewed the minutes of BOS 2019. • Discussed about final year project/internship/industry internship. • HOD discussed about the activities of Center for Automation Systems Engineering consultancy, at A & R department.	Review done and action proposed	Dr. Dhanesh Manik, IIT Bombay. Mr. Jitendra Kataria, Beckhoff Automation India Ltd.Pune Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.
2.0	• Review of modifications recommended by the Academic Council or the Principal after BOS 2019. • Reviewed the curriculum structure and credit distribution.		
3.0 Curriculum & Syllabus for batch 2017-21	• Review of Syllabi for VII & VIII Semester of the batch 2017-21, KLE Tech • As per the feedback from Academic council and BOS 2019, the changes made in the syllabus were proposed and presented. • Discussion on the electives prescribed in the syllabus was done and got inputs from the members. • HOD discussed about the capstone projects namely, Humanoid Robot, Ajit 2.0, Digital Twin and Automatic Storage and Retrieval System (ASRS). • HOD discussed about Autonomous Car project under Institutional Research Project(IRP) scheme with NVIDIA hardware platforms having high performance computing ability with AI solutions • Proposed the introduction of Project work titled Project 1 , 18EARW401 prescribed for 144 Hours. Decision taken in the Pre-BOS meeting to add one more project activity in VII semester for improving complex problem solving skills for students opting for internship program in VIII semester.	Review done and action proposed	Dr. Dhanesh Manik, IIT Bombay. Mr. Jitendra Kataria, Beckhoff Automation India Ltd.Pune Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.

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3.0 Curriculum & Syllabus for batch 2018-22	• **Review of Syllabi for V & VI Semester of the batch 2018-22, KLE Tech.** • No major changes suggested in the V semester syllabus prescribed. • Mrs. Ashwini, Asst. Professor, A&R Dept. shared the experience in handling the subject Machine Learning & Robot Operating System(ROS), for the current semester. • The subject content and the hands on practices were reviewed by members. • Reviewed the syllabus of AI for Autonomous Systems and got approval of BOS members • No major changes suggested in the VI semester syllabus.		Dr. Dhanesh Manik, IIT Bombay. Mr. Jitendra Kataria, Beckhoff Automation India Ltd.Pune Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.
4.0	• **Review and approval of Syllabi for III & IV Semester of the batch 2019-23, KLE Tech.** • No major changes introduced in the syllabus and get it approved	Review done	Dr. Dhanesh Manik, IIT Bombay. Mr. Jitendra Kataria, Beckhoff Automation India Ltd.Pune Mr. Supreet Kamatagi, Griffyn Robotech Pvt. Ltd.
5.0 Other Points (Research related)	• HOD presented the proposal for grooming research culture in the department. The research groups were presented in the area of Smart manufacturing and Cognitive Robotics. The views of all members on selection of research areas were welcomed. The members urged the need for team based efforts in research process. They expressed the need for involving faculty in industrial projects. • The BOS members also insisted that the up gradation of project solution should happen from one batch to the next, to transfer knowledge from senior batch to the junior batches.		