



## **SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE**

**(An Autonomous Institution)**

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)  
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &  
Accredited by NAAC with "A" Grade)

Madagadipet, Puducherry - 605 107



# **Department of Instrumentation and Control Engineering**

## **Minutes of Third BOS Meeting**

### ***Venue***

Seminar Hall, Department of ICE  
Sri Manakula Vinayagar Engineering College  
Madagadipet, Puducherry – 605 107

### ***Date & Time***

***25.08.2021 & 10.A.M***

**Department of Instrumentation and Control Engineering****Minutes of Third Board of Studies**

The Third Board of Studies meeting of the Department of Instrumentation and Control Engineering was held on 25<sup>th</sup> August 2021 at 10:00 A.M in the Seminar Hall, Department of ICE, Sri Manakula Vinayagar Engineering College with the Head of the Department in the Chair.

The following members were present for the BoS meeting

<b>Sl.No</b>	<b>Name of the Member with Designation and official Address</b>	<b>Responsibility in the BoS</b>
1	Dr. L. M. Varalakshmi Professor and Head Department of ICE, SMVEC	Chairman
2	Dr. P. A. Karthick, P.D.F. Professor Department of Instrumentation and Control Engineering National Institute of Technology, Tiruchirappalli	External Member Subject Expert
3	Dr.D. Manamalli Professor Department of Instrumentation Engineering, MIT Campus, Anna University	External Member Subject Expert
4	Dr. Anima Nanda Professor & Head/ BMI Director IQAC, Sathyabama University	External Member Subject Expert
5	Prof.T. Sudha Assistant Professor Department of ICE, SMVEC	Internal Member
6	Prof.J.Jeevanantham Assistant Professor Department of ICE, SMVEC	Internal Member
7	Prof. M. Rekha Assistant Professor Department of ICE, SMVEC	Internal Member
8	Dr. D. Sivanandakumar	Internal Member

	Associate Professor Department of ICE, SMVEC	
9	Prof. K. Naveenkumar Assistant Professor Department of ICE, SMVEC	Internal Member
10	Dr.S.Deepa Professor & Head Department of Chemistry,SMVEC	Internal Member
11	Dr. T. Gayathri Professor & Head Department of Mathematics,SMVEC	Internal Member
12	Dr. M. A. Ishrath Jahan Professor Department of English, SMVEC	Internal Member
13	Mrs.S. Geetha Assistant Professor Department of Physics, SMVEC	Internal Member
1	Mr. B. Murugan Senior Executive Engineer Biogenomonics	Co-opted Member Representative from Industry
2	Mr. S.Karthikeyan E-Beam control Operator Siechem Technologies pvt.Ltd	Co-opted Member Alumni Member

## Agenda of the Meeting

<b>Item No. : BoS / 2021 / ICE / UG / 3.1</b>	
	Welcome Address and to confirm the minutes of the second Board of Studies meeting held on 31.3.2021.
<b>Item No. : BoS / 2021 / ICE / UG / 3.2</b>	
	To discuss and approve the modification in conducting the Continuous Assessment Test for IV, III year and I year of Regulation R-2013, R-2019 and R-2020 respectively for the students admitted in 2018-2019, 2019-2020 and 2020-2021.
<b>Item No. : BoS / 2021 / ICE / UG / 3.3</b>	
	To approve the Curriculum structure under Autonomous Regulations 2019 and 2020 and the syllabi for semesters VII and VIII under Autonomous Regulations 2019 for the B.Tech – Instrumentation and Control Engineering students admitted in the Academic Year 2019-20.
<b>Item No. : BoS / 2021 / ICE / UG / 3.4</b>	
	To apprise the BoS members about the open elective course for the V semester under Regulation 2019 for the students admitted in the academic year 2019-20.
<b>Item No. : BoS / 2021 / ICE / UG / 3.5</b>	
	To review the employability enhancement courses under Autonomous Regulations 2019 - V semester and 2020 - II semester.
<b>Item No. : BoS / 2021 / ICE / UG / 3.6</b>	
	To apprise about the Industry Institute Interactions of the department of Instrumentation and Control Engineering.
<b>Item No. : BoS / 2021 / ICE / UG / 3.7</b>	
	To apprise about the End Semester Examination, conducted in blended mode (online and offline)
<b>Item No. : BoS / 2021 / ICE / UG / 3.8</b>	
	To discuss and recommend the panel of examiners to the Academic Council
<b>Item No. : BoS / 2021 / ICE / UG / 3.9</b>	
	Any other item with the permission of chair

## Minutes of the Meeting

Dr. L.M.Varalakshmi, Chairman, BoS initiated the meeting by welcoming the external members, the internal and co-opted members and thanked them for the detailed deliberations on the agenda items that had been approved by the Chairman.

**Item:  
BoS/  
2021/  
ICE/  
UG/ 3.1**

Chairman, BoS, appraised the minutes of second BoS, its implementation and confirmed with the approval for the incorporation of minor revisions needed for R-2020 as mentioned below.

**Revision :** (Annexure 1)

S. No	Regulation	Semester	Subject Name with Code	Unit	Particulars
1	R-2020	III	U20ICT306 Digital Logic Circuits	I	Logic families included
				II	Combinational circuit is combined into one unit
				III and IV	Sequential Circuits is split into III and IV unit

**Item:  
BoS/  
2021/  
ICE/  
UG/ 3.2**

Discussed and approved the modification in conducting the Continuous Assessment Test for IV, III year and I year of Regulation R-2013, R-2019 and R-2020 respectively for the students admitted in 2018-2019, 2019-2020 and 2020-2021.

**Item:  
BoS/  
2021/  
ICE/  
UG/ 3.3**

### **R2019 and R2020 - Curriculum**

The SMVEC Autonomous Regulations, R-2019, R-2020 and its curriculum was reviewed and approved with minor correction (Annexure 1).

S. No	Regulation	Semester	Subject Name with Code	Unit	Particulars
1	R-2019	VIII (Professional Elective-V)	U19ICE80 Industry Safety	Title	Name changed to Industrial Safety






### **R-2019 - Syllabi**











The syllabi for semesters VII and VIII under Autonomous Regulations 2019 were discussed elaborately and approved.

<b>Item:</b> <b>BoS/</b> <b>2021/</b> <b>ICE/</b> <b>UG/ 3.4</b>	<p><b>R-2019 – Open Elective-II</b></p> <p>The open elective-II for the V semester under autonomous Regulation 2019 was apprised for the students admitted in the academic year 2019-2020.</p> <ul style="list-style-type: none"> <li>Product Development and Design was reviewed, the external members suggested that students can develop a novel product in the forthcoming semester (VI) to enhance the effectiveness of the subject.</li> </ul> <p>IPR and Project Management for Engineers can be offered as value added course.</p>
<b>Item:</b> <b>BoS/</b> <b>2021/</b> <b>ICE/</b> <b>UG/ 3.5</b>	<p>The <b>Employability Enhancement Courses</b> chosen for II (R-2020) and V (R-2019) semester students were apprised</p> <p><b><u>Skill Development Course</u></b></p> <p><b>R-2020, II semester</b></p> <ul style="list-style-type: none"> <li>Skill Development Course-I : Demonstration of Workshop Practice</li> </ul> <p><b>R-2019, V semester</b></p> <ul style="list-style-type: none"> <li>Skill Development Course-V: Foreign Language / IELTS-I</li> </ul> <p><b>Foreign languages</b> suggested to the students are</p> <ul style="list-style-type: none"> <li>Japanese</li> <li>French</li> <li>Germany</li> </ul> <ul style="list-style-type: none"> <li>Skill Development Course-VI: Presentation Skills using ICT</li> </ul> <p><b><u>Mandatory Courses</u></b></p> <ul style="list-style-type: none"> <li>Environmental Science (<b>R-2020, II semester</b>)</li> <li>Essence of Indian Traditional Knowledge (<b>R-2019, V semester</b>)</li> </ul> <p><b><u>Certification Courses</u></b></p> <ul style="list-style-type: none"> <li>IoT using Python (<b>R-2020, II semester</b>)</li> <li>Advanced Java Programming (<b>R-2019, V semester</b>)</li> </ul> <p>Experts suggested to float the certification courses such as Artificial Intelligence, Machine Learning, Deep Learning for the students in future.</p>
<b>Item:</b> <b>BoS/</b> <b>2021/</b> <b>ICE/</b> <b>UG/ 3.6</b>	<p>The Industry Institute Interaction of B.Tech Instrumentation and Control Engineering were apprised and the suggestions regarding the associations were deliberated.</p> <p>More relevant industries to be identified in nearby areas to facilitate industrial exposure for students.</p> <p>National Skill Training Institute courses to be taken by students.</p>

<b>Item:</b> <b>BoS/</b> <b>2021/</b> <b>ICE/</b> <b>UG/ 3.7</b>	<b>End Semester Examination</b> The End Semester Examination were conducted in blended mode (online and offline) based on the willingness of the students. <b>Online mode:</b> Proctored mode
<b>Item:</b> <b>BoS/</b> <b>2021/</b> <b>ICE/</b> <b>UG/ 3.8</b>	<b>Panel members (Annexure-II)</b> Approved by BoS members and forwarded to Academic Council.
<b>Item:</b> <b>BoS/</b> <b>2021/</b> <b>ICE/</b> <b>UG/ 3.9</b>	Credits earned from NPTEL course can be exchanged with the credits of the regular papers. Student Exchange Program with abroad universities was suggested by the experts.

The meeting was concluded at 1.00 PM with vote of thanks by **Dr.L.M.Varalakshmi**, Head of Department, Instrumentation and Control Engineering

Sl.No	Name of the Member with Designation and official Address	Responsibility in the BoS	Signature
1	Dr. L. M.Varalakshmi Professor and Head Department of ICE, SMVEC	Chairman	
<b>External Members</b>			
2	Dr. P. A. Karthick, P.D.F. Professor Department of Instrumentation and Control Engineering National Institute of Technology, Tiruchirappalli	External Member	
3	Dr.D. Manamalli Professor Department of Instrumentation Engineering, MIT Campus, Anna University	External Member	
4	Dr. Anima Nanda Professor & Head/ BMI Director IQAC, Sathyabama University	External Member	
<b>Internal Members</b>			
5	Prof.T. Sudha Assistant Professor Department of ICE, SMVEC	Internal Member	

6	Prof.J.Jeevanantham Assistant Professor Department of ICE, SMVEC	Internal Member	
7	Prof.M.Rekha Assistant Professor Department of ICE, SMVEC	Internal Member	
8	Dr. D. Sivanandakumar Associate Professor Department of ICE, SMVEC	Internal Member	
9	Prof. K. Naveenkumar Assistant Professor Department of ICE, SMVEC	Internal Member	
10	Dr.S.Deepa Professor & Head Department of Chemistry, SMVEC	Internal Member	
11	Dr. T. Gayathri Professor & Head Department of Mathematics, SMVEC	Internal Member	
12	Dr. M. A. Ishrath Jahan Professor Department of English, SMVEC	Internal Member	
13	Mrs.S. Geetha Assistant Professor Department of Physics, SMVEC	Internal Member	
<b>Co-opted Members</b>			
1	Mr. B. Murugan Senior Executive Engineer Biogenomonics	Co-opted Member	
2	Mr. S.Karthikeyan E-Beam control Operator Siechem Technologies pvt.Ltd	Co-opted Member	

**Chairman-BoS /Dept. of ICE**  
**(Dr. L.M. Varalakshmi)**

**Dean Academics**  
**(Dr. S. Anbumalar)**

**Director cum Principal**  
**(Dr. V. S. K. Venkatachalapathy)**



## **Annexure– I**

**Course Objectives**

- To gain knowledge on number systems, boolean expressions and simplifications
- To study analyse and design combinational circuits.
- To study, analyse and design synchronous sequential circuits
- To study, analyse and design asynchronous sequential circuits
- To acquire knowledge about memory and programmable logic devices

**Course Outcomes**

*After completion of the course, the students will be able to*

**CO1** - Attain knowledge on basic binary systems. **(K3)**

**CO2** - Analyse the combinational circuits. **(K4)**

**CO3** - Analyse the synchronous sequential circuits **(K4)**

**CO4** - Analyse the asynchronous sequential circuits. **(K3)**

**CO5** - Acquire information about the memory devices and programmable logic devices. **(K2)**

**UNIT I BOOLEAN ALGEBRA AND LOGIC GATES (12 Hrs)**

Review of number systems – Arithmetic operations in binary number system – Binary codes – Boolean algebra and rules – Boolean functions: Simplifications: standard / canonical form of SOP and POS, Simplification using Karnaugh Map and Tabulation methods – Basic logic gates – Universal gates. Logic Families and their characteristics - DTL, TTL, CMOS, FAN-IN, FAN-OUT.

**UNIT II COMBINATIONAL LOGIC (12 Hrs)**

**Combinational circuits:** Analysis and design procedures – Circuits for arithmetic operations: Full adder, Carry look-ahead adder, binary adder, adder-subtractor, comparators – Code conversion – Decoders and Encoders – Multiplexers and De-multiplexers. Realization of combinational logic circuits using decoders and multiplexers.

**UNIT III SYNCHRONOUS SEQUENTIAL LOGIC (12 Hrs)**

Sequential circuits – Flip flops: Triggering, types, conversions, excitation tables – Analysis and design procedures – State reduction and state assignment – Shift registers – Counters: MOD counters, up-down counter, ring counters – Sequence detectors.

**UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC (12 Hrs)**

Analysis and design of asynchronous sequential circuits – Reduction of state and flow tables – Race-free state assignment – Arithmetic State Machines: Introduction, components, features, examples.

**UNIT V MEMORY AND PROGRAMMABLE LOGIC DEVICES (12 Hrs)**

RAM and ROM types – Memory decoding - Error detection and correction - Programmable logic devices: Programmable Array Logic – Programmable Logic Array –CPLD – FPGA.

**Text Books**

1. M. Morris Mano and Michael D. Cilette, Digital DesignII, Prentice Hall, Fifth Edition, 2011
2. Thomas L Floyd, "Digital Fundamentals", Prentice Hall, 11th Edition, 2014.
3. R.P. Jain, Modern Digital Electronics, 4th Edition TMH, 2010.

### Reference Books

1. Donald P. Leach and Albert Paul Malvino, Digital Principles and Applications, 6th Edition, TMH, 2003.
2. Charles H. Roth, Larry L. Kinney, Raghunandan G.H. Fundamentals of Logic Design, Cengage Learning India Pvt. Ltd.; 1<sup>st</sup> edition, 1 September 2019
3. William H. Gothmann, Digital Electronics Prentice Hall, 2001
4. John M. Yarbrough, Digital logic: Applications and Design Thomas Vikas Publishing House, 2002.
5. Anand Kumar, Fundamentals of Digital Circuits Prentice Hall of India, Pvt Ltd, New Delhi, Second Edition, 2014.

### Web References

1. <https://nptel.ac.in/courses/117106086/>
2. <https://learn.ni.com/teach/resources/1104/digital-electronics>
3. <http://nptel.ac.in/courses/117/106/117106086/>

### COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	-	-	-	-	-	1	-	1	3	-	3
2	3	3	3	3	-	-	-	-	-	1	-	1	3	-	3
3	3	3	3	3	-	-	-	-	-	1	-	1	3	-	3
4	3	3	3	3	-	-	-	-	-	1	-	1	3	-	3
5	2	3	3	3	-	-	-	-	-	1	-	1	3	-	3

**(1. Revised Professional Elective-V title : Industry Safety  
to Industrial Safety in Curriculum-2019)**

Professional Elective - V (Offered in Semester VIII)		
Sl. No.	Course Code	Course Title
1	U19ICE80	Industrial Safety
2	U19ICE81	System Identification and Adaptive Control
3	U19ICE82	Advanced Instrumentation system
4	U19ICE83	Industrial Data Networks
5	U19ICE84	Field Instrumentation and Cabling

## **Annexure –II**



# SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

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Madagadipet, Puducherry - 605 107



## DEPARTMENT OF INSTRUMENTATION AND CONTROL ENGINEERING

### DETAILS OF EXAMINERS FOR QUESTION PAPER SETTER AND EVALUATORS

Sl.No	Name of the Examiner	Specialization	Designation, Department and Institution in which currently working	Contact number and mail id
1	Dr.G.Sakthivel	Embedded System, Process Control	Professor, Department of EIE, Annamalai university. Chidambaram - 608 401	9443270714 gsauei@gmail.com
2	Dr.S.MourougaPrakash	Process Control	Asst prof / EIE Pondicherry Engineering College	9894463366 smpragash@pec.edu
3	Dr. M.Manivannan	Process Control and Instrumentation	Department of EIE, Annamalai university. Chidambaram - 608 401	9442646555 Manivannan1978@gmail.com
4	Dr.P.A.Sridhar	Biomedical Instrumentation	Assistant Professor, Department of Electronics & Instrumentation Engineering, Kattankulathur Campus, SRM Institute of Science and Technology	7598227170 sridhara1@srmist.edu.in
5	Dr.Palanivel	Process Control, Transducer and Measurements	Associate Professor – Dept of E & I Annamalai university, Annamalai Nagar, Chidambaram	9842565026 S_palanivel@yahoo.com
6	Dr.M.Jagannath	Biomedical Instrumentation	Assoc. Prof, School of Electronic Engineering, VIT, Chennai - 600127	9884386262 jagan.faith@gmail.com
7	Dr.A.Saraswathi	Drives and Control	Assistant Professor / HOD University college of engineering, Villupuram -605103	9994549910 saraswathiask@gmail.com
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12	Dr. M.PheminaSelvi	Electronics and Communications	Assistant professor / dept of ECE.University college of engineering,Villupuram - 605103	9994267707 vm.femina@gmail.com
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15	Dr.V.Ganesan	Electronics Circuits	Associate Professor, Department of ECE, Bharath University. Chennai.	9443723032 vganesh1711@gmail.com
16	Dr. A. Ashokan	Electronics Circuits	Department of ECE Government College of Engineering, Thanjavur.	9150376648