



Department of Electronics and Communication Engineering	LP: EC18451 Rev. No: 00 Date:25/02/2022
B.E./B.Tech/M.E./M.Tech : Marine Engineering Regulation: 2018	
PG Specialisation : -	
Sub. Code / Sub. Name : EC18451/ Marine Electronics	
Unit : I BASICS OF ELECTRONIC CIRCUITS	

Unit Syllabus:

Bipolar Junction Transistor (BJT)- Review of characteristics of BJT - Application of BJT as an amplifier, an oscillator and a switch 555 Timer-Introduction-Description of functional diagram -Applications-Missing pulse detector, Frequency divider.

Objective: To make the students to learn basics of Electronics Circuits.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to Bipolar Junction Transistor (BJT)	6	PPT
2	Review of characteristics of BJT	6	PPT
3	Application of BJT as an amplifier	6	PPT
4	Application of BJT as an oscillator and a switch	6	BB,PPT
5	555 Timer-Introduction-Description of functional diagram	6	BB,PPT
6	Applications of 555 Timer	3	BB,PPT
7	Missing pulse detector, Frequency divider	3	PPT
8	Frequency divider	3	PPT
9	Small Signal Amplifier	6	PPT
Content beyond syllabus covered (if any):		Small Signal Amplifier	

* Session duration: 50 minutes



Sub. Code / Sub. Name : EC18451/ Marine Electronics

Unit : II DIGITAL CIRCUITS

Unit Syllabus:

DIGITAL CIRCUITS 9

Introduction to Digital Circuits - Boolean expression - Minimization of Boolean expressions using K-Map, Combinational circuits – Multiplexers/ Demultiplexers – Encoders/Decoders - Sequential circuits-Asynchronous and synchronous Counters – Shift Registers - Memory – Different types of Memory

Objective: To make the students to be familiar with the concepts of Combinational and Sequential Circuits in Digital Electronics.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Introduction to Digital Circuits	1	PPT
11	Boolean expression	1	BB
12	Minimization of Boolean expressions using K-Map	1	PPT
13	Combinational circuits	1	PPT
14	Multiplexers/ Demultiplexers	1	BB,PPT
	CAT-I		
15	Encoders/Decoders	1	ICT,BB
16	Sequential circuits	1	PPT
17	Asynchronous and synchronous Counters	1	BB,PPT
18	Shift Registers, Memory – Different types of Memory. EPROM & PLA.	7,8	PPT,BB
Content beyond syllabus covered (if any): EPROM & PLA.			

* Session duration: 50 mins



Sub. Code / Sub. Name : EC18451/ Marine Electronics

Unit : III CONTROLLERS AND ELECTRONIC INSTRUMENTS

Unit Syllabus:

Controllers– Basics of Electronic Control Equipment – Control Mechanism of PLC (Programmable Logic Controller), Integrated Automation Control and Monitoring System (IACMS) – Computer Programmable Controller – Relay Circuit Unit – Digital Sequential Control Devices Electronic instruments: Cathode Ray Oscilloscope – Digital voltmeters – Multimeter – Signal Generators – Q – meters-Data loggers-Transducers for vibration, pressure, volume and velocity measurement.

Objective: To make the students to be exposed to controllers and measuring instruments

Session No *	Topics to be covered	Ref	Teaching Aids
19	Controllers– Basics of Electronic Control Equipment	4,5	BB
20	Control Mechanism of PLC (Programmable Logic Controller)	4,5	BB
21	Integrated Automation Control and Monitoring System (IACMS)	4,5	ICT,PPT
22	Computer Programmable Controller	4,5	PPT,BB
23	Relay Circuit Unit	4,5	PPT,BB
24	Digital Sequential Control Devices Electronic instruments: Cathode Ray Oscilloscope	4,5	PPT
25	Digital voltmeters	4,5	PPT
26	Multimeter – Signal Generators	4,5	PPT
27	Q – meters	4,5	BB
28	Power Meter and necessity of calibrations.	4,5	PPT
29	Data loggers	4,5	PPT
30	Transducers for vibration, pressure, volume and velocity measurement.	4,5	PPT

Content beyond syllabus covered (if any): - Power Meter and necessity of calibrations.

* Session duration: 50 mins



Sub. Code / Sub. Name : EC18451/ Marine Electronics

Unit : IV INDUSTRIAL ELECTRONICS

Unit Syllabus:

Thyristor – Audio Visual Alarms - Photoelectric devices – LED – LCD – 7 Segment Display– RADAR –SONAR –Fiber optic Gyroscope Sensor –Satellite Communication as applicable to GMDSS, GPS, INMARSAT.

Objective: To make the students to learn power electronic devices and Satellite Communication

Session No *	Topics to be covered	Ref	Teaching Aids
31	Thyristor	4,6	BB
32	Audio Visual Alarms	4,6	PPT
33	Photoelectric devices – LED	4,6	PPT
34	LCD	4,6	PPT
35	7 Segment Display	4,6	PPT
36	RADAR –SONAR	4,6	
	CAT-II		
37	Fiber optic Gyroscope Sensor	4,6	BB,PPT
38	Satellite Communication as applicable to GMDSS	4,6	BB,PPT
39	GPS	4,6	PPT
40	INMARSAT.	4,6	PPT

Content beyond syllabus covered (if any): - GLONASS

* Session duration: 50 mins



Sub. Code / Sub. Name : EC18451/ Marine Electronics

Unit : V MICROCONTROLLERS

Unit Syllabus: MICROCONTROLLERS 7

Introduction to Microcontrollers – Architecture of 8051 - Assembly Language Programming– Applications of 8051

Objective: To make the students to study the architecture and assembly language programming of 8051 microcontroller.

Session No *	Topics to be covered	Ref	Teaching Aids
41	Introduction to Microcontrollers	2,5	BB-PPT
42	Architecture of 8051	2,5	PPT
43	Assembly Language Programming - Basic Instructions	2,5	PPT
44	Assembly Language Programming - Arithmetic Instructions	2,5	PPT
45	Assembly Language Programming - Logical Instructions	2,5	PPT
46	Applications of 8051-Temperature control	2,5	PPT
47	Applications of 8051-Water level/flow control	2,5	PPT
48	Applications of 8051-Stepper motor control	2,5	PPT
49	Ladder programs	2,5	PPT
	CAT - III		
Content beyond syllabus covered (if any): Ladder programs			

* Session duration: 50 mins



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REFERENCES:

1. M. Morris Mano, "Digital Design", 4th Edition, Prentice Hall of India Pvt. Ltd., 2008 / Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003
2. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Second Edition, Pearson education, 2011
3. D.Roy Chowdhary, Shail. B.Jain, "Linear Integrated Circuits", Second edition, new age International 2003.2. Hofmann, "Global Positioning System", 5th Edition. Springer, Indian reprint 2007 (Yesdee Publishing Pvt. Ltd.)
4. P.S.Bimbhra, "Power Electronics", 3rd edition, Khanna Publisher, New Delhi, 2001.
5. Umesh Rathore, Ved Prakash Sharma, "Programmable Logic controller and Microcontroller", First Edition, S.K.KATARIA & SONS, Publisher of Engineering & Computer Book.
6. John.C.Payne, "Marine Electrical and Electronics bible", Third edition, Sheridan House Publishers, 2007.
7. <https://nptel.ac.in/courses/117106086/6>
8. <https://nptel.ac.in/courses/117106086/26>

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Designation	Assistant Professor	Professor
Date	25.02.2022	25.02.2022
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD