Government of Karnataka
Department of Technical Education
Board of Technical Examinations, Bengaluru

Course Title: Interfacing Lab		**Course Code: 15MC56P**
Mode (L:T:P) : 0:2:4	**Credits :3**	**Core/ Elective: Core**
Type of course: Tutorials and Practical's		**Total Contact Hours: 78**
CIE- 25 Marks		**SEE- 50 Marks**

Prerequisites: Knowledge of Basic Electrical and Electronics Engineering, Digital Electronics, Measurements and Microcontrollers

Course Objectives: The students are able to Interface Mechanical, Electrical and Electronics component using Arduino or suitable Interfacing boards.

Course outcome: At the end of the Course, the students must be able to:

1. Interface Mechanical, Electrical and Electronics component using Arduino or suitable Interfacing boards
2. Build an intelligent Device/System/Process using Arduino or suitable Interfacing boards

Course Outcome		**Cognitive Level**	**Linked with PO**	**Teaching Hours**
CO1	Interface Mechanical, Electrical and Electronics component using Arduino or suitable Interfacing boards	*Understanding/ Analyzing/ Application*	2,3,4	30
CO2	Build an intelligent Device/System/Process using Arduino or suitable Interfacing boards	*Analyzing/ Application/*	2,3,4	48
		Total sessions		**78**

Legend: R; Remember, U: Understand A: Application

Mapping of Course Outcomes with Program Outcomes

Course	Program Outcomes									
	1	2	3	4	5	6	7	8	9	10
Interfacing Lab	-	3	3	3	-	-	-	-	-	-

Contents

List of Circuits to be build using Arduino or suitable Interfacing boards:

1. Blinking of an LED
2. Controlling the brightness of an LED Using a potentiometer
3. Create unique color combinations Using RGB LED
4. Create various lighting sequences by Connecting 8 LED
5. Giving an input using push buttons
6. Controlling the ON/OFF of an LED by Connecting photo resistor
7. Connecting temperature sensor and reading the output
8. Using PWM to control and rotate a servo
9. Using flex/force sensor to control and rotate a servo
10. Using soft potentiometer to control RGB LED
11. Switching ON/OFF a piezoelectric buzzer
12. Control spinning of motor
13. Control ON/OFF of a relay
14. Using a shift register to control eight LEDs
15. Using ultrasonic sensor module to activate buzzer
16. Using pressure sensor module to activate relay
17. Detecting vibration and knocks using sound and piezomodule
18. Build an Intelligent system Using accelerometer/gyroscope/ gsm/Bluetooth/IR module/light sensor/LCD/keypad/camera/wifi.....any other modules (Any Two)

Sl No	Contents	CO	PO
1	Blinking of an LED	1	2,3,4
2	Controlling the brightness of an LED Using a potentiometer	1	2,3,4
3	Create unique color combinations Using RGB LED	1	2,3,4
4	Create various lighting sequences by Connecting 8 LED	1	2,3,4
5	Giving an input using push buttons	1	2,3,4
6	Controlling the ON/OFF of an LED by Connecting photo resistor	1	2,3,4
7	Connecting temperature sensor and reading the output	1	2,3,4
8	Using PWM to control and rotate a servo	1	2,3,4
9	Using flex/force sensor to control and rotate a servo	1	2,3,4
10	Using soft potentiometer to control RGB LED	1	2,3,4
11	Switching ON/OFF a piezoelectric buzzer	1	2,3,4
12	Control spinning of motor	1	2,3,4
13	Control ON/OFF of a relay	1	2,3,4
14	Using a shift register to control eight LEDs	1	2,3,4
15	Using ultrasonic sensor module to activate buzzer	1	2,3,4
16	Using pressure sensor module to activate relay	1	2,3,4
17	Detecting vibration and knocks using sound and piezomodule	1	2,3,4
18	Build an Intelligent system Using accelerometer/gyroscope/ gsm/Bluetooth/IR module/light sensor/LCD/keypad/camera/wifi.....any other modules (Any Two)	2	2,3,4

Scheme of valuation for SEE

Sl. No.	Performance	Max. Marks
1	Writing a Program for a given Task	15
2	Interfacing	20
3	Execution	15
	Total	50

Student Activity

Activity No.	Description of Student Activity
1	Perform a Task beyond the curriculum using Arduino or suitable Interfacing boards

Note:

1. Group of max four students should do any one of the above activity or any other similar activity related to the course COs and get it approved from concerned Teacher and HOD.
2. No group should have activity repeated or similar
3. Teacher should ensure activities by different groups must cover all Cos.

4. Teacher should asses every student by using suitable **Rubrics** approved by HOD

Sample Rubrics

Dimension	Exemplary	Accomplished	Developing	Beginning	Roll No. of the Student				
	5/4	3	2	1	1	2	3	4	5
Organization	Information presented in logical, interesting sequence	Information in logical sequence	Difficult to follow presentation--student jumps around	Cannot understand presentation--no sequence of information	2				
Subject Knowledge	Demonstrates full knowledge by answering all class questions with explanations and elaborations	At ease with expected answers to questions but does not elaborate	Uncomfortable with information and is able to answer only rudimentary questions	Does not have a grasp of the information. Cannot answer questions about subject	3				
Graphics	Explain and reinforce screen text and presentation	Relate to text and presentation	Occasionally uses graphics that rarely support text and presentation	Uses superfluous graphics or no graphics	4				
Oral Presentation	Maintains eye contact and pronounces all terms precisely. All audience members can hear	Maintains eye contact most of the time and pronounces most words correctly. Most audience members can hear presentation	Occasionally uses eye contact, mostly reading presentation, and incorrectly pronounces terms. Audience members have difficulty hearing	Reads with no eye contact and incorrectly pronounces terms. Speaks too quietly	5				
Total Score=(2+3+4+5)=14/4=3.5=4									

Course Assessment Pattern

Particulars			Max Marks	Evidence	Course outcomes
Direct Assessment	**CIE**	Two tests (Average of Two tests)	10	Blue books	1 &2
		Practical record	10	Practical record	1 &2
		Student Activity	05	Student Activity Sheets	1 &2
	SEE	End of the course	50	Answer scripts at BTE	1 &2
Indirect Assessment	**Student Feedback on course**	Middle of the course		Feedback forms	1 &2
		End of the course		Feedback forms	1 &2

*__CIE__ – Continuous Internal Evaluation *__SEE__ – Semester End Examination

Note:

1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student activities.