(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VIth)

Course Code	**US06CELE51**	Title of the Course	Discrete & Linear Circuits
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	The course is to make the students understand the various application (linear and non-linear) of OP-AMP. They will also learn about 555 timer and phase-lock loop system.

Course Content		
Unit	Description	Weightage* (%)
1.	**Operational Amplifier** Block diagram of OP-AMP, Differential amplifier, Virtual short concept, AC and DC parameters, Inverting amplifier and its applications – Scale changing amplifier, Summing amplifier, Phase shifting amplifier, Integrator, Differentiator, Summing integrator, Difference amplifier and Subtractor, Comparison of active and passive filter, Introduction to - Low pass filter, High pass filter, Band pass filter, Band reject filter, All pass filter.	25%
2.	**Nonlinear Applications of OP – AMP** Feedback diode comparator, Precision rectifier - Half wave precision rectifier, Full wave precision rectifier, Peak detector, Sample and hold (S/H) circuit, Monostable multivibrator, Astable multi vibrator, Voltage Controlled Oscillator (VCO).	25%
3.	**Miscellaneous applications of OP – AMP** Log amplifier: Basic equation, Basic logarithmic amplifier, Temperature compensated LOG amplifier, Antilog (Exponential) amplifier, Analog voltage multiplier, Analog voltage divider, Charge amplifier, Frequency to Voltage conversion, Clipper and Clamper circuits, Temperature to Voltage Converter.	25%
4.	**IC 555 Timer and PLL** Salient features of 555 Timer IC, Pin diagram and Functional diagram, Astable multivibrator and its applications, Monostable multivibrator and its applications, Schmitt trigger, Bistable multivibrator, Basic operating principle of PLL.	25%

Teaching-Learning Methodology	Online and Board work

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	After studying this syllabus student will learn the various application of OP-AMP. The arithmetic applications include adder, substractor, scalor and nolinear applications such as phase-shift amplifier, integrator, differentiator, etc
2.	After studying this syllabus students will learn various non-linear application of OP-AMP which includes diode comparator, precision rectifier, peak detector, S/H circuit and various multivibrators.
3.	After studying this syllabus students will learn Miscellaneous application of OP-AMP, this includes LOG and antiLOG amplifiers, exponential amplifier, and other related applications
4.	After studying this syllabus students will learn about 555 timer and its applications such as Astable multivibrator and Mono stable multivibrator. They will also learn principle of PLL.

Suggested References:	
Sr. No.	References
1.	Linear Integrated Circuits and its applications: P. W. Wani and P. V. Bhat
2.	OP - Amp and linear integrated circuits: R. A. Gaykwad

On-line resources to be used if available as reference material
On-line Resources

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(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VI)

Course Code	**US06CELE52**	Title of the Course	**Digital System**
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	In this course the students understand the basic working of electronic A/D & D/A Converters and fundamentals of semiconductor memories, especially Tristate switch & Advanced applications

Course Content		
Unit	Description	Weightage* (%)
1.	Types of ROMs, Semiconductor RAMs, Static RAMs, ECL RAMs, Dynamic RAMs, Address multiplexing, DRAM Refreshing, Tri-state switches.	25%
2.	Program Logic Devices, PAL, FPLA, PROM, Other PLD features, Magnetic memories, Magnetic core memory, Magnetic Disk memory.	25%
3.	Introduction, Digital to Analog (D/A) conversion, The R-2R Ladder types DAC, The weighted Resistor type DAC, Analog to Digital conversion, The Counter type A/D converter, The tracking type A/D converter, The Flash type A/D converter.	25%
4.	Successive Approximation, The Counting Converter, A comparision of converter types, A converter using voltage to frequency converter, A converter using Voltage to Time conversion, A/D converter Specification, Introduction of ADC 0801.	25%

Teaching-Learning Methodology	Online and Board work

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Help to understand the basic of memory and its operation
2.	Help to understand the programming of logic devices and fabrication/designing and programming of different semiconductor memories
3.	Helps to understand the concept of Analog/Digital and D/A Converter
4.	Make students understand various issue related to Analog/Digital and D/A Converter, Semiconductor memories & fundamentals of Program Logic Devices.

Suggested References:	
Sr. No.	References
1.	Fundamental of Digital circuits By : A. Anand Kumar
2.	Digital Integrated Electronics By : Herbert Taub & Donald Schilling
3.	Digital Fundamental By : Floyd

On-line resources to be used if available as reference material
On-line Resources

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(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VI)

Evaluation Pattern		
Sr.	Details of the Evaluation	Weightage

Course Code	**US06DELE53**	Title of the Course	**8-Bit Microprocessor Programming & Applications**
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	The course is to make the students understand the fundamentals of fiber optics and its working i.e. fiber optic technology

Course Content		
Unit	Description	Weightage* (%)
1.	Counter and time Delays, Hexadecimal counter, Modulo-10 counter, Pulse timing for flashing lights, Debugging counter and time delay programs, Stack Subroutines, Conditional and Non conditional CALL and Return instructions, Advance Subroutine concept and related examples.	25%
2.	Code conversion : BCD to Binary, Binary to BCD, BCD to Seven Segment, Binary to ASCII and ASCII to Binary.	25%
3.	BCD Addition, BCD Subtraction, Introduction to Advanced instructions and Applications, Multiplication and Subtraction with carry, the 8085 interrupts, Interrupts instructions and their utilization and their Examples.	25%
4.	Introduction to microcontroller, 8255 Peripheral Interface, 8254 Interval Timer, 8259 Interrupt Controller, DAC & ADC.	25%

Teaching-Learning Methodology	Online and Board work

No.		
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to

1.	Students learn how to design counters and time delays in routine and subroutines and its advance concepts
2.	Students learn the code conversion BCD to ASCII and vice versa
3.	Students will learn microprocessor mathematics and its advance instructions and their application.
4.	Student learn interfacing differenet I/O ports as 8255,8254, 8259 and etc

Suggested References:

Sr. No.	References
1.	Microprocessor , Architecture, Programming and Applications with the 8085/8080 By : Ramesh S. Gaonkar
2.	Microprocessor BY: V. J. Vibhute & P .B .Borole
3.	
4.	
5.	

On-line resources to be used if available as reference material

On-line Resources

(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VI)

Course Code	**US06DELE54**	Title of the Course	**Power Electronics**
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	The course is to make the students understand the fundamentals of fiber optics and its working i.e. fiber optic technology

Course Content

Unit	Description	Weightage* (%)
1.	Thyristors: Introduction, Symbolic Representation, Construction, Principle of operation and characteristics, Transistor Analogy, Methods of turning ON, Turn OFF mechanism, Series and parallel operation of SCRs and ,methods of triggering, String Efficiency.	25%
2.	Low Power devices:- CSCR, Relaxation oscillator using CSCR, UJT, Characteristics of UJT, UJT Relaxation oscillator, Triac, Construction and Triggering Modes of TRIAC. Thyristor Protection circuits, Gate control circuits, over voltage and over Current protection, Design of Snubber circuit.	25%
3.	Phase control using Triac, Power control, Static circuit Breaker, Over voltage protection, Zero voltage switch, Time Delay circuits, Logic circuits, Pulse Circuit.	25%
4.	Phase control Half wave and Full wave Phase control circuits, Half controlled Bridge circuits, Effect of freewheeling Diode, Dual converter, Application to speed control of motors, Regulated DC power supplies, and DC Motor control.	25%

Teaching-Learning Methodology	Online and Board work

No.		
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Know the basic concept, characteristics and applications of the devices of Thyristor family.
2.	Understand Low power devices and other devices used to control high power thyristors.
3.	Understand, design and troubleshoot low power application circuits of thyristors.
4.	Understand, design and troubleshoot high power application circuits of thyristors.

Suggested References:

Sr. No.	References
1.	An introduction to Thyristor and their Applications By : M. Ramamoorty
2.	Power electronics By: M.D.Singh and K.B.Khanchandani
3.	Thyristor Power Electronics By: M.D.Singh and K.B.Khanchandani

On-line resources to be used if available as reference material

On-line Resources

(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VI)

Course Code	**US06CELE55 (A)**	Title of the Course	PRACTICAL Based on Course US06CELE51
Total Credits of the Course	4	Hours per Week	6

Course Objectives:	By studying these students will learn application of OP-AMP and also about 555 timer IC

Course Content		
Unit	Description	Weightage* (%)
1.	OP-AMP as invertor and level shifter	10%
2.	OP-AMP as square wave generator	10%
3.	OP-AMP as integrator	10%
4.	OP-AMP as differentiator	10%
5.	555 timer as astable multivibrator	10%
6.	OP-AMP as adder	10%
7.	OP-AMP as subtractor	10%
8.	Others based on the syllabus (US06CELE51)	10%
9.		10%
10.		10%

Other experiments based on syllabus

Teaching-Learning Methodology	Online and lab work

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%

3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Students will understand practically functioning of OP-AMP and 555 timer.

Suggested References:	
Sr. No.	References
1.	

On-line resources to be used if available as reference material
On-line Resources

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(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VI)

Course Code	**US06CELE55 (B)**	Title of the Course	PRACTICAL Based on Course US06CELE52
Total Credits of the Course	4	Hours per Week	6

Course Objectives:	Student learn A to D and D to A fundamental

Course Content		
Unit	Description	Weightage* (%)
1.	R-2R , weighted Registers DAC	10%
2.	8-bit Analog to Digital Conversion using ADC 0800	10%
3.	Weighted resistor type DAC	10%
4.	A/D successive type	10%
5.	A/D counter type	10%
6.	R-2R , weighted Registers DAC with level amplifier	10%
7.	Other based on syllabus (US06CELE52)	10%
8.		10%
9.		10%
10.		10%

Other experiments based on syllabus

Teaching-Learning Methodology	Online and lab work

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%

3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Students can troubleshoot A to D and D to A converters

Suggested References:	
Sr. No.	References
1.	

On-line resources to be used if available as reference material
On-line Resources

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(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VI)

Course Code	**US06CELE55 (C)**	Title of the Course	PRACTICAL Based on Course US06CELE53
Total Credits of the Course	4	Hours per Week	6

Course Objectives:	Students learn advance applications of 8085.

Course Content		
Unit	Description	Weightage* (%)
1.	8-bit Analog to Digital Conversion using ADC 0800	10%
2.	BCD to Binary Conversion using 8085	10%
3.	Binary to BCD Conversion using 8085	10%
4.	BCD Addition and Subtraction	10%
5.	BCD to Seven segment LED code Conversion using 8085	10%
6.	Sum of 16-bit	10%
7.	Hexa-decimal division using 8085	10%
8.	Other based on syllabus (US06CELE53)	10%
9.		10%
10.		10%

Other experiments based on syllabus

Teaching-Learning Methodology	Online and lab work

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%

3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Student can do different type of conversions

Suggested References:	
Sr. No.	References
1.	

On-line resources to be used if available as reference material
On-line Resources

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(Bachelor of Science) (B.Sc. (Electronics))
(B.Sc.) (Electronics) Semester (VI)

Course Code	**US06CELE55 (D)**	Title of the Course	PRACTICAL Based on Course US06CELE54
Total Credits of the Course	4	Hours per Week	6

Course Objectives:	

Course Content		
Unit	Description	Weightage* (%)
1.	Characteristics of SCR (Output and Gate)	10%
2.	Characteristics of UJT	10%
3.	Characteristics of DIAC	10%
4.	Relaxation oscillator using UJT	10%
5.	Phase control using SCR	10%
6.	Phase control using TRIAC	10%
7.	DC motor Speed Control using Thyristor.	10%
8.	AC motor Speed Control using Thyristor.	10%
9.	Other based on syllabus (US06CELE54)	10%
10.		10%

Other experiments based on syllabus

Teaching-Learning Methodology	Online and lab work

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%

3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	

Suggested References:	
Sr. No.	References
1.	

On-line resources to be used if available as reference material
On-line Resources

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