Course Code	US05MAELC01	Title of the Course	Microprocessor Interrupts & Interfacing			
Total Credits of the Course	04	Hours per Week 04				
Programme Outcome (PO) - For B.Sc.	<ol> <li>Bachelor of knowledge o Policy 2020.</li> </ol>	1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.				
Communication Programme	2. This program diploma cour having multi	This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.				
	3. Bachelor of S the overall b Master progra	Science programme ack ground prepara amme or jobs or to	e at Sardar Patel University is designed keeping ation in mind for the student to either opt for a become an entrepreneur.			
	4. At the entry as major sub students.	<ol> <li>At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> </ol>				
	5. In addition to and value-ad students.					
	6. After end of minimum rec					
	7. The students programme v	have the enough with any major subj	opportunity to complete four-year graduation ect as per their choice.			
	8. The students, opt for the m semester, or i	after completion of aster's degree prog n a related disciplin	of the program from Sardar Patel University, can gramme in the subject they have had at the final ne.			
Programme	1. To improve the	he scientific awarer	ness among the students.			
Outcome (PSO) – B.Sc.	2. To make stu Communicati	dents to understan on in the developm	d the role and contribution of Electronics and ent of science and technology.			
(Electronics and Communication) Programme	3. To improve experimental experimental	To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and data as well as results obtained.				
	4. To help st Communicati	udents in under on.	standing the concepts of Electronics and			



		5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems.			
		6. To understand the conceptual development of the subject and ther interest in the subject.	eby develop the		
		7. To create interest in the subject and improve technological aspe projects, projects, models, demonstrations, etc.	ct through mini		
		8. To create interest in the subject to continue to work in the f particularly in Electronics and Communication.	field of science		
		9. To Understand the impact of electronics in modern era.			
Course Objecti	ives:	<ol> <li>In this course, students will be learning about the electronics instrum used in our day to-day life.</li> <li>To understand the basics of semiconductor components like resistor inductor their applications will be introduced.</li> </ol>	ent which were		
		Course Content			
Unit	Description Weightage (%)				
1.	<ul> <li>Microprocessor Architecture: Microprocessor Architecture and its Operations, Fetching, decoding and execution of an Instruction, concept of Peripheral I/O and Memory Mapped I/O. Instruction Set of 8085: 8085 Programming Model, Instruction Classification, Instruction and Data Format, Addressing Modes. Data Transfer Operations, Arithmetic Operations, Logic Operations, Branch Operations.</li> </ul>				
2.	<ul> <li>Programming Techniques: Looping, Counting and Indexing, Additional Data Transfer and 16-bit Arithmetic Instructions, Arithmetic Operation related to Memory, Logic Operations: Rotate, Compare, Counters and Time Delays with few examples.</li> <li>Stacks and Subroutines: Stack, Subroutine, Restart, conditional call, and return instructions; BCD Addition, BCD Subtraction, Introduction to advanced instructions and applications, multiplication, subtraction with carry.</li> </ul>				
3	Interrupts & Interfacing Data Converters: 8085 Interrupt, 8085 Vectored Interrupts, Direct Memory Access, Digital-to-Analog Converter (basic concepts, D/A Converter Circuits, Interfacing 8-bit D/A Converter), Analog-to-Digital Converter (basic concepts, Successive Approximation A/D Converter, Interfacing 8-bit A/D Converter).25%				
4	Programmable Interface Devices: 8155 Multipurpose Programmable Device (I/O ports & Timer, Interfacing 7-segment-LED), 8255 programmable peripheral interface (block diagram, modes), 8253/8254 Programmable Interval Timer (block diagram, programming 8254), 8259 Programmable Interrupt Controller (block diagram, interrupt operation and features).25%				
Teachir Learnin	ıg- g	Direct Teaching through Chalk-Walk and Talk ICT enabled teaching			



MethodologyQuestion-Answer Class discussion led by teacher/students Case Studies Literature review Problem solving activities Debate Collaborative and Co-operative Learning Think Pair Share Jigsaw Inquiry Based Learning Panel Discussion Project Based Learning Flipped Classroom Blended Learning designs Concept Mapping					
		Evaluation Pattern			
Sr. No.	r. Details of the Evaluation Weighta				
1.	1.Internal Written / Practical Examination Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)50				
2.	University	Examination	50%		
Course knowle unders	Course Outcomes: On the successful completion of the course, the students should be able to apply their knowledge to solve problems, analyze complex issues, design solutions, conduct investigations, and understand the societal and ethical implications of their work.				
		Suggested References:			
Sr. No	. Referen	ces			
1.	1. R. S. Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, 6th Ed., Penram International/ Prentice Hall, 2002.				
2.	N. K. Srinath, 8085 Microprocessor Programming and Interfacing, Prentice Hall of India, 2005				
3.	3. Fundamentals of microprocessors and microcomputers – B. Ram (Dhanpat Rai Pub.)				
On-lin	e resources	to be used if available as reference material			
On-lin	e Resources	:			
https:// https:// www.a	/www.electr /www.electr allaboutcircu	onics-tutorials.ws/ onicshub.org/tutorials/ uits.com			

\*\*\*\*



Course Code	US05MAELC02	Title of the Course	Analog and Linear Integrated Circuit			
Total Credits of the Course	04	Hours per Week	04			
Programme Outcome (PO) - For B.Sc.	1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.					
Electronics and Communication Programme	2. This program diploma cour having multi	<ol> <li>This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> </ol>				
	3. Bachelor of S the overall back Master progra					
	4. At the entry level of the programme, i.e., semester one, various subjects of as major subject, minor subject, interdisciplinary subject as per choice students.					
	5. In addition to and value-ad students.	In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.				
	6. After end of minimum req	After end of the even semesters, the students may take exit after fulfilling the minimum requirements.				
	7. The students programme w	have the enough with any major subj	opportunity to complete four-year graduation ect as per their choice.			
	8. The students, opt for the m semester, or i	after completion c aster's degree prog n a related disciplin	of the program from Sardar Patel University, can gramme in the subject they have had at the final ne.			
Programme	1. To improve th	e scientific awaren	ess among the students.			
Outcome (PSO) – B.Sc.	2. To make stud Communicatio	lents to understand on in the developme	d the role and contribution of Electronics and ent of science and technology.			
(Electronics and Communication) Programme	3. To improve s experimental s experimental r	scientific attitude skills, data analysis nethod and data as	and to give emphasis on the development of s, calculations, and also on the limitations of the well as results obtained.			
	4. To help stu Communicatio	idents in underson.	standing the concepts of Electronics and			



		5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems.			
		6. To understand the conceptual development of the subject and ther interest in the subject.	eby develop the		
		7. To create interest in the subject and improve technological aspe projects, projects, models, demonstrations, etc.	ct through mini		
		8. To create interest in the subject to continue to work in the f particularly in Electronics and Communication.	field of science		
		9. To Understand the impact of electronics in modern era.			
Course       1. In this course, students will be learning about the electronics instrument were used in our day to-day life.         2. To understand the basics of semiconductor components like resistor, capacing inductor their applications will be introduced.			strument which r, capacitor and		
		Course Content			
Unit	Description Weightage* (%)				
1.	<ul> <li>OP-AMP Basics: Introduction to op-amps, ideal Characteristics, Pin configuration of 741 op-amp, Block diagram of OPAMP, Voltage series and voltage shunt feedback amplifier and its effect on Ri, Ro, bandwidth, and voltage gain, Differential Amplifier; Bias, offsets and drift, CMRR, slew rate, Frequency compensation of OP-AMP.</li> </ul>				
2.	Linear and Non-linear applications of OPAMP: Inverting and non- inverting summing, scaling and averaging Amplifier Differential Amplifier configurations, Current to Voltage and Voltage to Current Convertor, Integrator, Differentiator; Comparator, characteristics of comparator, applications of comparator, Schmitt trigger, voltage limiters, clippers and clampers, peak detectors, sample and hold circuits.				
3	Active Filters and Oscillators: Active Filters, Low pass, High pass, Band pass and Band Reject filters, Design and frequency scaling of First order and second order, Butterworth filters. Oscillators, Oscillator principle, types and frequency stability, design of phase shift, wein bridge, voltage controlled oscillators.25%				
4	<b>555 Timer and Phase Locked Loop</b> : 555 Timer functional diagram, monostable and astable operation, applications, Block diagram of PLL and its function, PLL types, characteristics/parameters of PLL, and different applications of PLL. <b>25%</b>				
types, characteristics/parameters of PLL, and different applications of PLL.         Teaching- Learning Methodology       Direct Teaching through Chalk-Walk and Talk         ICT enabled teaching Question-Answer Class discussion led by teacher/students Case Studies Literature review					



	Problem solving activities Debate Collaborative and Co-operative Learning Think Pair Share Jigsaw Inquiry Based Learning Panel Discussion Project Based Learning Flipped Classroom Blanded Learning designs			
	Concept Mapping			
	Evaluation Pattern			
Sr. No.	Details of the Evaluation	Weightage		
1.Internal Written / Practical Examination Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)50				
2.	University Examination	50%		
Course knowle unders	Outcomes: On the successful completion of the course, the students should be able t edge to solve problems, analyze complex issues, design solutions, conduct investi- and the societal and ethical implications of their work.	o apply their igations, and		
	Suggested References:			
Sr. No	. References			
1.	1. Ramakant A. Gaikwad, "Op Amps and Linear Integrated Circuits", Pearson Education 2000.			
2.	George Clayton and Steve Winder, "Operational Amplifiers", 5th Edition Newnes			
3.	. Salivahanan and Kanchana Bhaskaran, "Linear Integrated Circuits", Tata McGraw Hill,India 2008			
4.	4. S. P. Bali,"Linear Integrated Circuits", Mc Graw Hill 2008			
On-line	e resources to be used if available as reference material			
On-line	e Resources:			
https:// https:// www.a	www.electronics-tutorials.ws/ www.electronicshub.org/tutorials/ llaboutcircuits.com			

\*\*\*\*



Course	Code	US05MAELC03	Title of the Course	Electronics and Communication Pract		
Total C the Cou	Credits of urse	04	Hours per Week	08		
			Course Cont	ent		
Sr. No.		I	ist of Experiment	s	Weightage* (%)	
			Section A			
1.	Practical b	based on microprocesso	r 8085.			
2.	Practical b	based on microprocesso	r 8085.			
3.	Practical b	based on microprocesso	r 8085.			
4.	Practical b	based on microprocesso	r 8085.		500/	
5.	Practical b	based on microprocesso	r 8085.		50%	
6.	Practical based on microprocessor 8085.					
7.	Practical based on microprocessor 8085.					
8.	Practical based on microprocessor 8085.					
			Section B			
1.	To study Op Amp as a subtractor.					
2.	To study (	Op Amp as a Adder.				
3.	To study (	Op Amp as an Integrato	r.			
4.	To study (	Op Amp as a Differentia	ator.			
5.	To study low pass filter 50%					
6.	To study h	nigh pass filter				
7.	To study b	band pass filter				
8.	To study a	all pass filter				
9.	Astable Multivibrator					



Course Code	US05MIELC0	Title of the Course	Computer Network			
Total Credits of the Course	02	02 Hours per Week 02				
Programme Outcome (PO) - For B.Sc.	1. Bachelor knowledg Policy 202	1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.				
Communication Programme	2. This prog diploma having m	<ol> <li>This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> </ol>				
	3. Bachelor the overa Master pr					
	4. At the enable as major students.					
	5. In additio and value students.	In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students. After end of the even semesters, the students may take exit after fulfilling the minimum requirements. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.				
	6. After end minimum					
	7. The stude programm					
	8. The stude opt for th semester,	nts, after completion of e master's degree pro or in a related discipli	of the program from Sardar Patel University, can gramme in the subject they have had at the final ne.			
Programme	1. To improv	e the scientific aware	ness among the students.			
Specific Outcome (PSO) – B.Sc.	2. To make Communi	To make students to understand the role and contribution of Electronics and Communication in the development of science and technology.				
(Electronics and Communication) Programme	3. To impro experiment experiment	. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and data as well as results obtained.				
	4. To help Communi	students in under cation.	rstanding the concepts of Electronics and			



		5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems.			
		6. To understand the conceptual development of the subject and ther interest in the subject.	eby develop the		
		7. To create interest in the subject and improve technological aspe projects, projects, models, demonstrations, etc.	ct through mini		
		8. To create interest in the subject to continue to work in the f particularly in Electronics and Communication.	field of science		
		9. To Understand the impact of electronics in modern era.			
Course Objectives:1. In this course, students will be learning about the electronics instrument which used in our day to-day life. 2. To understand the basics of semiconductor components like resistor, capacitor inductor their applications will be introduced.			ent which were		
		Course Content			
Unit		Description Weightage* (%)			
1.	<ol> <li>Network Topology Introduction, Applications Topology, Common bus, Star, ring, fully connected, combined topology, OSI model and its various layers, TCP/IP model, Connection Protocols, collision detection</li> </ol>				
2.	2.Network Security Security strategy, design and implementation, Security tools: Packet filtering, Encryption, Virtual Private Network, Intrusion Detection System, Password management, firewall policies architecture and functioning50%				
Teachin Learnin Method	g- g ology	Direct Teaching through Chalk-Walk and Talk ICT enabled teaching Question-Answer Class discussion led by teacher/students Case Studies Literature review Problem solving activities Debate Collaborative and Co-operative Learning Think Pair Share Jigsaw Inquiry Based Learning Panel Discussion Project Based Learning Flipped Classroom Blended Learning designs Concept Mapping			
		Evaluation Pattern			



Sr. No.	Sr. Details of the Evaluation No.				
1.	. Internal Written / Practical Examination Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3) 50%				
2.	University Examination	50%			
Course knowle unders	e Outcomes: On the successful completion of the course, the students should be able t edge to solve problems, analyze complex issues, design solutions, conduct investi tand the societal and ethical implications of their work.	o apply their gations, and			
	Suggested References:				
Sr. No	Sr. No. References				
1.	1. Data Communication and Networking - B.A.Forouzan				
2.	2. Computer Networks – A.S.Tannenbaum				
On-line resources to be used if available as reference material					
On-line Resources:					
https:// https:// www.a	https://www.electronics-tutorials.ws/ https://www.electronicshub.org/tutorials/ www.allaboutcircuits.com				

\*\*\*\*\*



Course	Code	US05MIELC02	Title of the Course	Electronics and Communication Practica			
Total C the Cou	Credits of urse	02	Hours per Week	04			
	Course Content						
Sr. No.	List of Experiments						
1.	STAR TOPOLOGY						
2.	MESH TOPOLOGY						
3	LAN NETWORKING						
4	WAN NETWORKING						
5	MAN NETWORKING						
6	TREE TOPOLOGY						



Course Code	US05MIELC03		Title of the Course	<b>Optical Fiber Communication</b>			
Total Credits of the Course		02	Hours per Week 02				
Programme Outcome (PO) - For B.Sc.	1.	. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.					
Electronics and Communication Programme	2.	This program diploma cour having multi	This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.				
	3.	Bachelor of S the overall ba Master progra	Science programme ack ground prepara amme or jobs or to	e at Sardar Patel University is designed keeping ation in mind for the student to either opt for a become an entrepreneur.			
	4.	4. At the entry level of the programme, i.e., semester one, various subjects offere as major subject, minor subject, interdisciplinary subject as per choice of the students.					
	5.	In addition to and value-ad students.	In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students. After end of the even semesters, the students may take exit after fulfilling the minimum requirements. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.				
	6.	After end of minimum req					
	7.	The students programme w					
	8.	The students, opt for the m semester, or is	after completion of aster's degree prog n a related disciplin	of the program from Sardar Patel University, can gramme in the subject they have had at the final ne.			
Programme	1.	To improve th	ne scientific awarer	ness among the students.			
Specific Outcome (PSO) – B.Sc.	2.	To make stud Communication	dents to understan on in the developm	d the role and contribution of Electronics and ent of science and technology.			
(Electronics and Communication) Programme	3.	To improve experimental experimental	scientific attitude skills, data analysi method and data as	and to give emphasis on the development of s, calculations, and also on the limitations of the s well as results obtained.			
	4.	To help str Communication	udents in under on.	standing the concepts of Electronics and			



		5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems.							
		6. To understand the conceptual development of the subject and thereby develop the interest in the subject.							
		7. To create interest in the subject and improve technological aspect through mini projects, projects, models, demonstrations, etc.							
		8. To create interest in the subject to continue to work in the field of science particularly in Electronics and Communication.							
		9. To Understand the impact of electronics in modern era.							
Course Objectives:		<ol> <li>In this course, students will be learning about the electronics instrument which were used in our day to-day life.</li> <li>To understand the basics of semiconductor components like resistor, capacitor and inductor their applications will be introduced.</li> </ol>							
	Course Content								
Unit		Weightage* (%)							
1.	Basic of Optical fiber Introduction, elements of fiber optic communication system, advantages, optical spectral band, nature of light, structure of fiber optic cable, Basic optical laws: reflection, refraction, snell's law, total internal reflection, Acceptance angle, Numerical Aperture.50%								
2.	<ul> <li>Optical Sources and Detectors Optical Sources: Introduction, review of semiconductor physics, Light emitting Diode, structure of LED, Light source material, Surface emitting LED, edge emitter LED, Laser Diode, structure, Comparison of LED Vs LASER, Optical Detectors: introduction, PIN photo detector, Avalanche Photodiode.</li> </ul>								
Teaching- Learning Methodology		Direct Teaching through Chalk-Walk and Talk ICT enabled teaching Question-Answer Class discussion led by teacher/students Case Studies Literature review Problem solving activities Debate Collaborative and Co-operative Learning Think Pair Share Jigsaw Inquiry Based Learning Panel Discussion Project Based Learning Flipped Classroom Blended Learning designs Concept Mapping							



Evaluation Pattern							
Sr. No.	. Details of the Evaluation						
1.	Internal Written / Practical Examination Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)						
2.	University Examination						
Course Outcomes: On the successful completion of the course, the students should be able to apply their knowledge to solve problems, analyze complex issues, design solutions, conduct investigations, and understand the societal and ethical implications of their work.							
Suggested References:							
Sr. No	r. No. References						
1.	1. Optical Fiber Communication –Gerd Keiser (4thEdition)						
2.	2. Fiber Optic communication –V.B.Patel (ATUL PRAKASHAN)						
3.	Optical Fiber Communication-D.C Agarwal (wheeler Publication)						
On-line resources to be used if available as reference material							
On-line Resources:							
https://www.electronics-tutorials.ws/ https://www.electronicshub.org/tutorials/ www.allaboutcircuits.com							

\*\*\*\*



Course Code		US05MIELC04	Title of the Course	Electronics and Communication Practical				
Total Credits of the Course		02	Hours per Week	04				
Course Content								
Sr. No.		Weightage* (%)						
1.	BENDIN							
2.	NUMERI							
3	VOICE L							
4	ANALOO							
5	CHARACTERISTICS OF LIGHT EMITTING DIODE							
6	USE OF PHOTODIODE							

