MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Electronic Devices & Circuits	Subject Code BECES1-301	Semester 3rd
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the principles of semiconductor physics	3									2		2			
CO2	Understand the concepts of junction diodes and their applications.	3									2		2			
CO3	Understand and utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems	3	2	2							2		2			2
CO4	Analyze BJT characteristics and determine their behavior under low and high frequencies.		2		1						2		2	2		2
CO5	Analyze various concepts of FETs and their characteristics.				1						2		2	2		2
CO6	Design low and high frequency models and observe and their various characteristics.			2	1						2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Digital Electronic Circuits & Design	Subject Code BECES1-302	Semester 3rd
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand working of logic families and logic gates.	3			1						2		2			2
CO2	Design and implement Combinational and Sequential logic circuits.		2	2	1						2		2	2		2
CO3	Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder		2	2	1						2		2	2		2
CO4	Design & analyze synchronous sequential logic circuits		2	2	1						2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Signals and Systems		Subject Code BECES1-303	Semester 3rd
Credit: 4		L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Analyze the properties of signals & systems and representation in time and frequency domain.		2	2	1						2					2
CO2	Classify systems based on their properties and determine the response of LSI system.		2	2	1						2			2	1	2
CO3	Apply random signal theory and understand various types of noise.	3				1					2			2	1	2
CO4	Understand the process of sampling and reconstruction	3	2		1						2			2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Network Theory: Analysis & Synthesis	Subject Code BECES1-304	Semester 3rd
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand basics electrical circuits with nodal and mesh analysis.	3	2								2			2		2
CO2	Appreciate electrical network theorems.	3	2								2			2		2
CO3	Apply Laplace Transform for steady state and transient analysis	3	2	2	1	1					2			2		2
CO4	Determine different network functions.	3	2								2			2		2
CO5	Appreciate the frequency domain techniques.	3	2								2			2		2
CO6	Students will be able to design analog filters.	3		2	1	1					2			2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Electronic Devices & Circuits Lab	Subject Code BECES1-305	Semester 3rd
Credit: 1	L T P 0 0 2	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	An ability to understand all types of electronics devices and circuits	2	2								2			2	3	2
CO2	An ability to conduct experiments, as well as to analyze and interpret various data sheets.		2	2	2	3				3	2		2	2	3	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Digital Electronic Circuits & Design Lab	Subject Code BECES1-306	Semester 3rd
Credit: 1	L T P 0 0 2	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	An ability to test and verify working and truth tables of combinational and sequential circuits.		2	2	1	1				1	2		2	2	1	2
CO2	Working knowledge of different converters.	3		2	1	1				1	2		2	2	1	2
CO3	To perform multiplexer and demultiplexer.			2	1	1				1	2		2	2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Mathematics-III		Subject Code BMATH3-301	Semester 3rd
Credit: 4		L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Apply the concept of fourier series and transformation to solve practical problems in physics and various areas of mathematics	2	1		2	2								2	2	1
CO2	Apply a range of techniques to solve first & second order partial differential equations.	2	1		1	1								1	1	1
CO3	Model physical phenomena using partial differential equations such as the heat and wave equations.	3	1		2	2								2	2	2
CO4	To understand concepts of partial order relations, Boolean algebra, Lattices and to show logical equivalences by using truth tables and rules in logics	2	2		2	1	1				1		1	1	2	1

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Training-I	Subject Code BECES1-307	Semester 3rd
Credit: 4	L T P - - -	Duration: ____

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Students should know various tools available in the field of ECE	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	Gain knowledge & skills for usage of tools/ trainers.	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
CO3	Design simple analog/digital circuits	3	3	3	3	3		3		2	3	2	2	3	3	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Analog and Digital Communication	Subject Code BECES1-401	Semester 4th
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Analyze and compare different analog modulation schemes for their efficiency and bandwidth.		2	2	1	1					2		2	2		2
CO2	Analyze the behavior of a communication system in presence of noise.		2	2	1	1					2		2	2		2
CO3	Investigate pulsed modulation system and analyze their system performance.	3	2	2	1	1					2		2	2		2
CO4	Analyze different digital modulation schemes and can compute the bit error performance		2	2	1	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Analog Electronic Circuits	Subject Code BECES1-402	Semester 4th
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the characteristics of diodes and transistors	3	2								2		2	2		2
CO2	Design and analyze various rectifier and amplifier circuits		2	2	2						2		2	2		2
CO3	Design sinusoidal and non-sinusoidal oscillators		2	2	2						2		2	2		2
CO4	Understand the functioning of OP-AMP and design OP-AMP based circuits	3	2	2	2						2		2	2		2
CO5	Design ADC and DAC		2	2	2						2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Electromagnetic Theory & Applications		Subject Code BECES1-403	Semester 4th
Credit: 4		L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Examine the phenomena of wave propagation in different media and its interfaces and in applications of microwave engineering.	3	2	2	1						2		2	2		2
CO2	Understand the concepts of magnetic field and magnetic field intensity.	3	2								2		2	2		2
CO3	Analyze Maxwell's equation in different forms (differential and integral) and apply them to diverse engineering problems.		2	2	1						2		2	2		2
CO4	Understand transmission lines and use of smith chart in electromagnetic engineering problems.	3	2	2	1	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Analog and Digital Communication Lab	Subject Code BECES1-404	Semester 4th
Credit: 1	L T P 0 0 2	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	An ability to perform transmission of signals from transmitter to receiver using various modulation and demodulation techniques.	2	2	2	2	3				3	2		2		1	2
CO2	Design and implement base band transmission schemes.		2	2	2	3				3	2		2		1	2
CO3	Design and implement band pass signaling schemes.		2	2	2	3				3	2		2		1	2
CO4	Understand basic blocks of communication using MATLAB									3	2		2		1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Analog Electronic Circuits Lab	Subject Code BECES1-405	Semester 4th
Credit: 1	L T P 0 0 2	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	An ability to understand different types of electronics devices and circuits	3	2	2	2	3				3	2		2	2	3	2
CO2	An ability to design and conduct experiments, as well as to analyse and interpret output.	3	2	2	2	3				3	2		2	2	3	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Engineering Mechanics**		Subject Code **BMECE0-001**	Semester **4th**
Credit: **4**		**L T P 3 1 0**	Duration: **60 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Students shall be able to understand problems related to Mechanics	1	1					2		1	1			2	1	
CO2	Shall be able to apply this knowledge to find solution of engineering problems			2								2		2	1	
CO3	This will make student learning life long	3	3	1					2	3	3	1		2	1	
CO4	Students can use knowledge in new areas													2	1	

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Microprocessors & Microcontrollers**	Subject Code **BECES1-501**	Semester **5**th
Credit: **4**	**L T P 3 1 0**	Duration: **60 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	To learn architecture of microprocessors 8085 & 8086 and microcontroller 8051.	3	2								2		2	2		2
CO2	To understand interfacing of microprocessor 8085 with memory and peripheral devices.	3	2			1					2		2	2		2
CO3	To write assembly language programs for 8 bit microprocessors and microcontrollers.	3	2	2	2	1					2		2	2		2
CO4	To apply and implement the interfacing and programming techniques of microprocessors and microcontrollers in various practical problems/projects.	3	2	2	2	1				1	2	1	2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Information Theory and Coding	Subject Code BECES1-502	Semester 5th
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Explain measure of information and entropy.	3	2	2	2	1					2		2	2		2
CO2	Model the continuous and discrete communication channels.	3				1					2		2	2		2
CO3	Describe the encoding and decoding for various codes	3	2								2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Control Systems & Applications	Subject Code BECES1-503	Semester 5th
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Perform time domain and frequency domain analysis of control systems required for stability analysis.	3	2								2		2	2		2
CO2	Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.	3	2	2	2	1					2		2	2		2
CO3	Express and solve system equations in state-variable form (state variable models).	3	2	2	2						2		2	2		2
CO4	Determine the (absolute) stability of a closed-loop control system	3	2	2	2						2		2	2		2
CO5	Apply root-locus technique to analyze and design control systems.	3	2	2	2	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Control Systems Lab	Subject Code BECES1-504	Semester 5th
Credit: 1	L T P **0 0 2**	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Perform time domain and frequency domain analysis of control systems required for stability analysis.	2	2	2	2					3	2		2			
CO2	Apply root-locus technique to analyze and design control systems.	2	2	2	2					3	2		2			
CO3	Use servomotor and potentiometers for various control system applications.	2	2	2	2					3	2		2			

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Microprocessors & Microcontrollers Lab**	Subject Code **BECES1-505**	Semester **5th**
Credit: 1	**L T P 0 0 2**	**Duration: 30 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Interface different I/Os with processor.	2	2	2	2	3				3	2		2		1	2
CO2	Execute various assembling language programs in 8085/8051.	2	2	2	2	3				3	2		2		1	2
CO3	Write programs for 8051 micro controller kit	2	2	2	2	3				3	2		2		1	2
CO4	Understand programs for speed control of stepper motor and DC motor.	2	2	2	2	3		2		3	2		2		1	2

Enter Correction levels 1, 2 or 3 as defined below:

   1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Training-II		Subject Code BECES1-506	Semester 5th
Credit: 4		L T P - - -	Duration: _____

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	To justify acquired engineering knowledge with real industrial environment.	3	3					3		3	3		3	3	3	2
CO2	Exposure to advanced tools, techniques and engineering practices in the industry.	3	3	3		3		2		3	3	3	2	3	2	3
CO3	Exposure to general work place behavior, professional ethics and to build interpersonal and team skills.	3					3	3	3	3	3	3	3	2	3	3
CO4	To prepare and present professional work, reports and presentations etc.	3				3			3		3	3	3	3	2	3

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Antenna and Wave Propagation	Subject Code BECES1-511	Semester 5th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the properties and various types of antennas.	3	2								2		2	2		2
CO2	Describe the radiation from a current element.	3	2								2		2	2		2
CO3	Analyze the properties of different types of antennas and their design.	3	2	2	1						2		2	2		2
CO4	Analyze the antenna arrays, aperture antennas and smart antennas.	3	2	2	1						2		2	2		2
CO5	Describe the different modes of wave propagation.	3	2								2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject VHDL Design	Subject Code BECES1-512	Semester 5th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the hardware description language	3	2	2	1	1					2		2	2		2
CO2	Model and design digital logic systems using VHDL.	3	2	2	1	1					2		2	2		2
CO3	Design of digital systems using ROMs, PALs, PLDs, etc.	3	2	2	1	1					2		2	2		2
CO4	Design and model dedicated and general-purpose microprocessor using VHDL	3	2	2	1	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Computer Architecture	Subject Code BECES1-513	Semester 5th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Define the basic structure of a computer	3	2	2	1	1	1				2		2	2		2
CO2	Explain the principles of functional blocks of a computer	3	2				1				2		2	2		2
CO3	Analyze the performance of computers	3	2	2			1				2		2	2		2
CO4	Apply the knowledge to design a hypothetical computer	3	2	2	1	1	1				2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Industrial Automation**		Subject Code **BECES1-514**	Semester **5th**
Credit: 3		**L T P 3 0 0**	**Duration: 45 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand various industrial automation components and control systems.	3	2								2		2	2		2
CO2	Explain architecture of industrial automation system.	3	2								2		2	2		2
CO3	Use Internet of Things for industrial automation.	3	2	2	1	1					2		2	2		2
CO4	Understand Programmable logic controllers, PLC programming, Advantage of using PLC for Industrial purposes.	3	2	2	1	1	1				2		2	2		2
CO5	Describe the overview of Industrial automation using robots.	3	2								2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Digital Signal Processing	Subject Code BECES1-601	Semester 6th
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Represent signals mathematically in continuous and discrete time and frequency domain.	3	2								2		2	2	1	2
CO2	Obtain the response of LSI systems to various signals.	3	2		1						2		2	2	1	2
CO3	Apply DFT for the analysis of digital signals & systems.	3	2	2	1	1					2		2	2	1	2
CO4	Implementation of LSI systems.	3	2	2	1	1					2		2	2	1	2
CO5	Design IIR and FIR filters for various signal processing applications.	3	2	2	1	1					2		2	2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Computer Communication Networks	Subject Code BECES1-602	Semester 6th
Credit: 4	L T P 3 1 0	Duration: 60 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Describe the architecture of computer and wireless communication networks	3									2		2	2		2
CO2	Compare OSI reference model and TCP/IP protocol suite.	3	2								2		2	2		2
CO3	Classify computer and communication networks and associated standards	3	2	2	1						2		2	2		2
CO4	Acquire knowledge about wireless cellular communication with different technologies.	3				1					2		2	2		2
CO5	Compare wireless networks on the basis of technologies, architecture and applications	3	2	2	1	1					2		2	2		2
CO6	Assess the performance of a cellular network in terms of its coverage and capacity	3	2	2	1	1					2		2	2		2
CO7	Apply knowledge in understanding working of various emerging network technologies	3	2	2	1	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Digital Signal Processing Lab	Subject Code BECES1-603	Semester 6th
Credit: 1	L T P 0 0 2	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the handling of discrete signals using MATLAB platform.	2	2	2		3				3	2		2	2	3	2
CO2	Understand the basic operations of digital signal processing.	2	2							3	2		2	2	3	2
CO3	Design IIR and FIR filters for low pass and high pass applications.	2	2	2	2	3				3	2		2	2	3	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Computer Communication Networks Lab	Subject Code BECES1-604	Semester 6th
Credit: 1	L T P **0 0 2**	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Identify the different types of network devices and their functions within a network	2	2							3	2		2	2	3	2
CO2	Compare different network topologies		2	2		3				3	2		2	2	3	2
CO3	Familiarity with the basic protocols of computer networks 4.	2	2	2	2					3	2		2	2	3	2
CO4	Acquire the ability to setup and configure LAN/WLAN.	2	2	2	2					3	2		2	2	3	2
CO5	Analyze the simulated performance of different protocols.	2	2	2	2	3				3	2		2	2	3	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Electronic Measurement		Subject Code BECES1-605	Semester 6th
Credit: 1		L T P **0 0 2**	Duration: 30 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Design and validate DC and AC bridges	3	2	2	1	1				1	2		2	2	1	2
CO2	Analyze the dynamic response and the calibration of few instruments.	3	2	2	1	1				1	2		2	2	1	2
CO3	Learn about various measurement devices, their characteristics, their operation and their limitations.	3	2		1					1	2		2	2	1	2
CO4	Understand data acquisition.	3	2		1					1	2		2	2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Mini Project/Electronic Design Workshop		Subject Code BECES1-606	Semester 6th
Credit: 2		L T P 0 0 4	Duration: _____

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Perform electronics projects as an individual or as an team member	3	3				3	3	2	3	2	2	3	3		3
CO2	Use literature to identify the engineering problems and its applications.	3	3				2		2		2		3	3		
CO3	Explore the suitable methods to solve the basic engineering problems and justifying engineering ethics considering conservation of eco-system.	3	3	3	3	3		2		3	3	3	3	3	3	
CO4	To develop the skills for report writing and presentation.	3							3		3			3	3	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Microwave Theory and Techniques		Subject Code BECES1-611	Semester 6th
Credit: 3		L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand various microwave system components and their properties.	3	2		2					1	2		2	2	1	2
CO2	Analyze microwave circuits using scattering parameters.	3	2		2					1	2		2	2	1	2
CO3	Analyze various antenna parameters and different kinds of antennas.	3	2		2					1	2		2	2	1	2
CO4	Understand different microwave systems.	3	2							1	2		2	2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Power Electronics	Subject Code BECES1-612	Semester 6th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Build and test circuits using power devices such as SCR.	3	2	2						2	2		2	2	2	2
CO2	Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters.	3	2	2	1	1				2	2		2	2	2	2
CO3	Learn how to analyze these inverters and some basic applications.	3	2	2	1					2	2		2	2	2	2
CO4	Apply power electronics technology to design SMPS	3	2	2	1	1	1	1		2	2		2	2	2	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Embedded Systems	Subject Code BECES1-613	Semester 6th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Build design approach using advanced controllers to real-life situations.	3	2	2	2	1		1		1	2		2	2	1	2
CO2	Design interfacing of the systems with other data handling/processing systems.	3	2	2	2	1		1		1	2		2	2	1	2
CO3	Appreciate engineering constraints like energy dissipation, data exchange speeds etc.	3	2							1	2		2	2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Fundamentals of Management for Engineers		Subject Code BHSMC0-014	Semester 6th
Credit: 3		L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Recognize the role of a manager and how it relates to the organization's mission.	2	1											3		3
CO2	Define management, its four basic functions and skills.		2										2	3	1	3
CO3	Know critical management theories and philosophies and how to apply them.	1		2	2		2							3		3
CO4	Recognize the concept of social responsiveness and its benefits.							3					2	3		3
CO5	Explain the relationship between strategic, tactical, and operational plans	1			2									2		

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low)   2. Moderate (Medium)   3. Substantial (High)

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Fiber Optic Communications	Subject Code BECES1-711	Semester 7th
Credit: 3	L T P 3 0 0	Duration: 45Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the principles of fiber optic communication and the bandwidth advantages.	3	2								2		2	2		2
CO2	Understand the properties of the optical fibers and optical components.	3	2								2		2	2		2
CO3	Understand the operation of lasers, LEDs, and detectors.	3	2								2		2	2		2
CO4	Design Fiber optic link and understand non-linear effects in optical fibers.	3	2	2	2	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Mobile Communication and Networks**	Subject Code **BECES1-712**	Semester **7**th
Credit: **3**	**L T P 3 0 0**	Duration: **45 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the working principles of the mobile communication systems.	3	2								2		2	2		2
CO2	Understand the relation between the user features and underlying technology.	3	2								2		2	2		2
CO3	Analyze mobile communication systems for improves performance.	3	2		2						2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Parallel Processing	Subject Code BECES1-721	Semester 7th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the need and applications of parallel processing.	3	2	2	2								2	2		2
CO2	Explain terminologies used for parallel computation.	3	2	2		1					2		2	2		2
CO3	Describe software and hardware related issues and challenges of parallel processing	3	2	2	2	1							2	2	1	2
CO4	Differentiate among the popular parallel computing architectures.	3	2		2								2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Scientific Computing**		Subject Code **BECES1-722**	Semester **7th**
Credit: 3		**L T P 3 0 0**	**Duration: 45 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the basic concepts of scientific computing.	3									2		2	2		2
CO2	Demonstrate the knowledge of scientific applications of computer programs.	3	2	2	2	1					2		2	2		2
CO3	Understand simple mathematical models and scientific problems and implement a solution in an adequate scientific programming language.	3	2	2	2	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Neural Network & Fuzzy Logic**	Subject Code **BECES1-723**	Semester **7th**
Credit: **3**	**L T P 3 0 0**	Duration: **45 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	To design different types of ANNs for variety of applications.	3	2	2	2	1					2		2			2
CO2	To apply ANN to various real world applications.	3	2	2	2	1					2		2			2
CO3	To learn Fuzzy Algebra and design fuzzy inference systems.	3	2	2	2	1					2		2			2
CO4	To design and apply Neuro-fuzzy and genetic algorithms for different applications.	3	2	2	2	1					2		2			2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject VLSI Technology	Subject Code BECES1-731	Semester 7th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Demonstrate an understanding of the processes involved in IC fabrication.	3	2								2		2	2	1	2
CO2	Understand the assembly and packaging of ICs and their significance.	3	2								2		2	2	1	2
CO3	Understand the design procedural sequence of various processes for IC fabrication of CMOS and bipolar devices	2	2	2	2	1					2		2	2	1	2
CO4	To learn the concepts of designing VLSI Subsystems	2	2	2	2						2		2	2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject CMOS Design		Subject Code BECES1-732		Semester 7th
Credit: 3		L T P 3 0 0		Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the operation of MOS devices.	3	2								2			2	1	2
CO2	Design different CMOS circuits using various logic families along with their circuit layout.	3	2	2	2	1					2			2	1	2
CO3	Design different CMOS combinational and sequential circuits.	3	2	2	2	1					2			2	1	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject High Speed Electronics	Subject Code BECES1-733	Semester 7th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand significance and the areas of application of high-speed electronics circuits.	3	2								2		2	2		2
CO2	Understand the properties of various components used in high-speed electronics.	3	2								2		2	2		2
CO3	Design High-speed electronic system using appropriate components.	3	2	2	2	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Project Stage-I**		Subject Code **BECES1-701**	Semester **7th**
Credit: **2**		**L T P 0 0 4**	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Perform multi-disciplinary task/project as an individual or as an team member	3	3				3	3	2	3	2	2	3	3		3
CO2	Use literature to identify the latest engineering problem and it scope in real time applications.	3	3				2		2		2		3	3		
CO3	Apply the suitable methods and material to solve the identified engineering problem justifying engineering ethics and conservation of eco-system.	3	3	3	3	3		2		3	3	3	3	3	3	
CO4	Represent the engineering activities undertaken with the effective report writing and presentation.	3							3		3			3	3	2
CO5	Perform multi-disciplinary task/project as an individual or as an team member	3	3				3	3	2	3	2	2	3	3		3

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Environmental Science (MC)**		Subject Code **BMNCC0-102**	Semester **7th**
Credit: **Non-Credit Course**	**L T P 2 0 0**		Duration: 30 **Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Technologies based on ecological principles and environmental regulations, which in turn helps in sustainable development.	-	-	3	-	-	2	3	-	-	-	-	-	3	-	-
CO2	Conceptualize the processes and various factors involved in the formation of environment.	1	-	-	3	-	-	-	-	-	-	-	-	-	-	2
CO3	Recognize the importance of environment and the sustainable natural resources.	-	-	-	-	-	-	3	-	-	-	-	-	-	-	2
CO4	Use scientific reasoning to identify and understand environment problems and evaluate potential solution.	3	3	3	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Identify the impacts of human activities on environment and role of society in these impacts.	-	-	-	-	-	-	-	-	3	-	-	2	-	2	2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Training-III	Subject Code BECES1-702	Semester 7th
Credit: 4	L T P - - -	Duration: ------

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	To justify acquired engineering knowledge with real industrial environment.	3	3					3		3	3		3	3	3	2
CO2	Exposure to advanced tools, techniques and engineering practices in the industry.	3	3	3		3		2		3	3	3	2	3	2	3
CO3	Exposure to general work place behavior, professional ethics and to build interpersonal and team skills.	3					3	3	3	3	3	3	3	2	3	3
CO4	To prepare and present professional work, reports and presentations etc.	3				3			3		3	3	3	3	2	3

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Wireless Sensor Networks	Subject Code BECES1-811	Semester 8th
Credit: 3	L T P 3 0 0	Duration: 45Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Design wireless sensor networks for a given application	3	2	2	2	1					2		2	2		2
CO2	Understand emerging research areas in the field of sensor networks	3	2			1					2		2	2		2
CO3	Understand MAC protocols used for different communication standards used in WSN	3	2								2		2	2		2
CO4	Explore new protocols for WSN	3	2		2						2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Satellite Communication	Subject Code BECES1-812	Semester 8th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Visualize the architecture of satellite systems as a means of high speed, high range communication system.	3	2								2		2	2		2
CO2	Understand link design for satellite communication.	3	2	2	2	1					2		2	2		2
CO3	Understand and utilize the basic approaches for multiple access techniques.	3	2	2	2	1					2		2	2		2
CO4	Solve numerical problems related to orbital motion and design of link budget for the given parameters and conditions.	3	2	2	2	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Error Correction Coding		Subject Code BECES1-813	Semester 8th
Credit: 3		L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand fundamentals of channel coding schemes and their application areas	3	2								2		2	2		2
CO2	Define the sources of error in digital communication	3									2		2	2		2
CO3	Explain the fundamental limits to achieve the Shannon's Channel Capacity	3	2	2	2						2		2	2		2
CO4	Describe the importance and principle of ECC in data communication and storage.	3	2								2		2	2		2
CO5	Demonstrate an ability to compare and contrast strengths and weaknesses of various ECC	3	2	2	2						2		2	2		2
CO6	Develop and model different ECC for appraise of reaching data rate to Shannon limit.	3	2	2	2	1					2		2	2		2
CO7	Apply the mathematical ideas to design well known ECC	3	2	2	2	1					2		2	2		2
CO8	Demonstrate competence in analyzing and evaluating different ECC	3	2	2	2	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Machine Learning	Subject Code BECES1-821	Semester 8th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand the concept of data processing.	3	2								2		2	2		2
CO2	Understand the concepts of supervised and unsupervised learning.	3									2		2	2		2
CO3	Understand the concept of classification	3	2								2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Data Mining & Big Data	Subject Code BECES1-822	Semester 8th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Develop algorithms for finding patterns in large data sets.	3	2	2	2	1					2		2	2		2
CO2	Apply novel cutting-edge techniques to applications of Big Data Computing in industry.	3	2	2	2	1					2		2	2		2
CO3	Analyze various frameworks and large-scale data storage technologies.	3	2	2	2	1					2		2	2		2
CO4	Apply Data Mining concepts to real life problems.		2	2	2	2					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Artificial Intelligence**		Subject Code **BECES1-823**	Semester **8th**
Credit: 3		**L T P 3 0 0**	**Duration: 45 Hrs.**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Apply the concepts of knowledge representation, planning and reasoning for real world applications.	3	2	2	2	1					2		2	2		2
CO2	Apply AI techniques to solve complex problems of Industry using machine learning.	3	2	2	2	1					2		2	2		2
CO3	Apply AI techniques to solve problems in Image Processing and NLP.	3	2	2	2	1					2		2	2		2
CO4	Learn to use AI with complete Ethics and Follow legal considerations.	3					1		2		2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Internet of Things	Subject Code BECES1-824	Semester 8th
Credit: 3	L T P 3 0 0	Duration: 45 Hrs.

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Explore the interconnection and integration of the physical world and the cyber space.	3	2	2	2	1					2		2	2		2
CO2	Develop skills to build machine to machine communication.	3	2	2	2	1					2		2	2		2
CO3	Design and develop of IoT Devices.	3	2	2	2	1					2		2	2		2
CO4	Identify how IoT differs from traditional data collection systems.	3	2	2	2	1					2		2	2		2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject **Project Stage-II**		Subject Code **BECES1-801**	Semester **8th**
Credit: 5		**L T P 0 0 10**	**Duration: ----**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Perform multi-disciplinary task/project as an individual or as an team member	3	3				3	3	2	3	2	2	3	3		3
CO2	Use literature to identify the latest engineering problem and it scope in real time applications.	3	3				2		2		2		3	3		
CO3	Design the suitable methods and material to solve the identified engineering problem justifying engineering ethics and conservation of eco-system.	3	3	3	3	3		2		3	3	3	3	3	3	
CO4	Represent the engineering activities undertaken with the effective report writing and presentation.	3							3		3			3	3	2

Enter Correction levels 1, 2 or 3 as defined below:

   1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Essence of Indian Knowledge Tradition (MC)	Subject Code BMNCC0-006	Semester 8th
Credit: 0	L T P **2 0 0**	Duration: 30 Hrs

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand philosophy of Indian culture.	2					2	1	2	2			3			2
CO2	Distinguish the Indian languages and literature among difference traditions.	2	2				2	1	2	2			3			2
CO3	Learn the philosophy of ancient, medieval and modern India.	2	2				2	1	2	2			3			2
CO4	Acquire the information about the fine arts in India.	2	2				2	1	2	2			3			2
CO5	Know the contribution of scientists of different eras.	2	2				2	1	2	2			3			2
CO6	The essence of Yogic Science for Inclusiveness of society.	2	2				2	1	2	2			3			2

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%

MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **ELECTRONICS & COMMUNICATION ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Electronics & Communication Engineering

COs, POs, PSOs Mapping

Subject Project Management and Entrepreneurship		Subject Code BHSMC0-024	Semester 8th
Credit: **3**		L T P **3 0 0**	Duration: **45**

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand project characteristics and various stages of a project.	2							2					3	3	
CO2	Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.					2							2	3	3	
CO3	Know the parameters to assess opportunities and constraints for new business ideas.	1					2							3	3	2
CO4	Understand the systematic process to select and screen a business idea	1							1			3	2	3	3	2
CO5	Understand various funding opportunities available for start-up and new ventures										1		3	3	1	3

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30%   2. Moderate (Medium) – above 30% and upto70%   3. Substantial (High) – above 70%