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GOVERNMENT POLYTECHNIC MUMBAI

(Academically Autonoums Instititute, Government of Maharashtra)

Teaching and Examination Scheme (P19R)

With effect from AY 2022-23

Programme: Diploma in Information Technology (Sandwich Pattern) **Term / Semester - III**

Course Code	Course Title	Teaching Hours/Contact Hours				Credits	Examination Scheme (Marks)						
							Theory			PR	OR	TW	Total
		L	P	TU	Total		TH	TS1	TS2				
CO19R306	Database Management System	3	4		7	7	60	20	20	50*		25	175
IT19R206	Data Communication	3	---		3	3	60	20	20				100
IT19R303	Java Programming	3	4		7	7	60	20	20	50*		25	175
IT19R207	Microprocessor	3	2		5	5	60	20	20	25		25	150
IT19R302	Multimedia Technology	1	2		3	3				25		25	50
HU19R102	Environmental Studies		2		2	2					25	25	50
IT19R304	PHP & MYSQL (MOOC)		3#		3#	3#							
UV19R103	Universal Human values III				2	2							
	Total	**13**	**17**		**32**	**32**	**240**	**80**	**80**	**150**	**25**	**125**	**700**
Student Centered Activity(SCA)					**03**								
Total Contact Hours					**35**								

Abbreviations: L- Theory Lecture, P-Practical, TU-Tutorial, TH- Theory Paper TS1 & TS2- Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment)
* Indicates assessment by External Examiner else internal practical skill assessment, # indicates Self, on- line learning Mode, @ indicates on line examination Note: Duration of Examination--
TS1&TS2 -1 hour , TH- 2 hours, PR/OR – 3 hours per batch , SCA- Library -1 hour, Sports- 2hours, Creative Activity-2 hours Self, on- line learning Mode through MOOCS/Spoken Tutorials /NPTEL/SWAYAM/FOSSEE etc.

Coordinator
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Head of Department
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In-Charge
Curriculum Development Cell

Principal

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CDC Co-ordinator
G. P. Mumbai

Programme: **Diploma in Information Technology (Sandwich Pattern)**									
Course Code: **IT19R206**				Course Title: **Data Communication**					
Compulsory / Optional: **Compulsory**									
Teaching Scheme and Credits				Examination Scheme					
TH	PR	TU	Total	TH (2 Hrs 30min)	TS1 (1Hr)	TS2 (1Hr)	PR	OR	TW	Total
3	--	--	**3**	**60**	**20**	**20**	---	---	---	**100**

Abbreviations: L- Theory Lecture, P-Practical, TU-Tutorial, TH- Theory Paper TS1 & TS2- Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment) , * Indicates assessment by External Examiner else internal practical skill test , # indicates Self, on- line learning Mode, @ indicates on line examination

Note: For Minimum passing marks under various heads, refer, examination rule AR26. Two practical skill tests are to be conducted. First skill test at midterm and second skill test at the end of the term

Rationale:

Data communication, which is the transmission of digital data through a network or to a device external to the sending device, is the basis of computer networks. Most of the instruments used in IT can now be connected to the network. The Information technology diploma pass outs are required to handle the data communication related problems. This course examines the important concepts and techniques related to data communication and enables students to have an insight into technology involved to make network communication possible.

Course Outcomes:

Student should be able to:

CO1	Identify process of data communication
CO2	Select relevant types of transmission media depending upon requirements.
CO3	Identify various Multiplexing and Switching techniques used in digital communication.
CO4	Identify types of transmission error and error correction techniques.
CO5	Select components of relevant IEEE standards for wireless communication.

Unit No	Topics / Sub-topics
1	**Introduction to Data Communication** 1.1 Process of data communication and its components: Transmitter, receiver. Medium, Message, Protocol. 1 .2 Protocols, Standards, Standard organizations.

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	1 .3 Bandwidth, Data Transmission Rate, Baud Rate and Bits per second. 1 .4 Modes of Communication (Simplex, Half duplex, Full Duplex). Analog Signal and Digital Signal, Analog and Digital transmission Digital-to-Analog Conversion: Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying Analog-to-analog conversion: Amplitude Modulation, Frequency Modulation,Phase Modulation **Course Outcome:CO1 Teaching Hours :10 Marks: 12 (R-04, U-04, A-04)**
2	**Transmission Media** Communication Media: Guided Transmission Media Twisted-Pair Cable, Coaxial Cable Fiber-Optic Cable Unguided Transmission Media Radio Waves, Microwaves, Infrared, Satellite Line-of-Sight Transmission Point to Point, Broadcast **Course Outcome:CO2 Teaching Hours :10 Marks: 14(R-02, U-04, A- 08)**
3	**Multiplexing and Switching** Multiplexing: Frequency-Division Multiplexing, Wavelength-Division Multiplexing, Synchronous Time Division Multiplexing, Statistical Time-Division Multiplexing Spread spectrum: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS) Switching: Circuit-switched networks, Datagram networks, Virtual-circuit networks **Course Outcome: CO3 Teaching Hours : 09 Marks: 12(R-02, U-02, A- 08)**
4	**Error Detection and Correction** The OSI model Layered Architecture Types of Errors, Forward Error Correction Versus Retransmission Error Detection: Repetition codes, Parity bits, Checksums, CRC Error Correction: Automatic repeat request (ARQ), Error-correcting code Framing Fixed-Size Framing, Variable-Size Framing

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	4.3 Flow and error control techniques: stop and wait, sliding window, Go-back-n ARQ, Selective Reject ARQ **Course Outcome:CO4 Teaching Hours : 08 Marks: 12 (R-02, U-02, A-08)**
5	**Wireless Communication** 5.1 IEEE wireless Standards: 802.11, 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac. 5.2 Wireless LANs: 802.11: Architecture MAC Sub layer, Addressing Mechanism 5.3Bluetooth Architecture: Bluetooth Layers, Radio Layer, Baseband Layer The Logical Link Control and Adaptation Layer Protocol (L2CAP),Smart Bluetooth, Near field communication(NFC) The Mobile Telephone System First-Generation: Analog Voice Second-Generation: Digital Voice Third-Generation: Digital Voice and Data 4G and VoLTE, Introduction to 4G and VoLTE, Features of 4G and VoLTE. Next generation mobile communication. **Course Outcome: CO5 Teaching Hours : 08 Marks: 10 (R- 04, U-04, A- 02)**

Suggested Specifications Table (Theory):

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Introduction to Data Communication	04	04	04	12
2	Transmission Media	02	04	08	14
3	Multiplexing and Switching	02	02	08	12
4	Error Detection and Correction	02	02	08	12
5	Wireless Communication	04	04	02	10
	Total	14	16	30	60

References/ Books:

Sr. No.	Title	Author, Publisher, Edition and Year Of publication	ISBN
1	Data communications and networking.	Forouzan Behrouz, A Tata McGraw Hill, New Delhi, 2006.	9780-07-296775-3

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2	Computer Networks	Andrew s. Tanenbaum PHI Learning, New Delhi, 201 5	978-0-13-212695-3
3	Fundamentals of Business Data Communication	FitzGerald Jerry, Dennis Alan Wiley India Pvt. Ltd. New Delhi, 201 1	9788126521500
4	Data and Computer Communications	Stallings William Pearson Education, I nc.,NJ 07458	0-13-243310-9
5	Data Communication and Networks	Godbole Achyut McGraw Hill, New Delhi, 2006	0070472971

CO VsPO and CO Vs PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	1	2		1	2			1
CO2	1			1				3	1	2
CO3		2	1		1		1			2
CO4				1		2		3	2	
CO5	2	2	2	1		3	3		1	3

Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organization
1	Mr. Mandar Tawade	Software Development Engineer	Transformhub Mumbai
2	Mrs. Sadaf Shaikh	Lecturer in Information Technology	Government Polytechnic Thane
3	Dr. R. A. Patil	Sel. Grade Lecturer in Electronics	Government polytechnic Mumbai

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I/C, Curriculum Development Cell

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Programme : **Diploma in Information Technology**										
Course Code:**IT19R303**				Course Title: **Java Programming**						
Compulsory / Optional: **Compulsory**										
Teaching Scheme and Credits				Examination Scheme						
TH	TU	PR	Total	TH	TS1	TS1	PR	OR	TW	Total
3	-	4	7	60	20	20	50*		25	175

*Assessment by External Examiner

Rationale:

Java is platform independent, open source object oriented programming language enriched with free and open source libraries. In current industrial scenario java has the broad industry support and is prerequisite with many allied technologies like Advanced Java, java Server Pages, and Android Application Development. Thus current industrial trends necessitate acquiring Java knowledge for computer engineering and information technology graduates. This course develops necessary skills in students to apply object oriented programming techniques in java so that students will be able to develop complete applications using core java.

Course Outcomes:

Student should be able to:

CO1	Develop Programs using Object oriented Methodology in java.
CO2	Apply concept of arrays and strings.
CO3	Apply concept of inheritance for code reusability.
CO4	Develop programs using user defined packages and interfaces.
CO5	Develop programs using multithreading and Exception handling.
CO6	Develop programs using lambda expressions and generics.
CO7	Develop programs for handling I\O and file stream and Collections

Course Content Details:

Unit No	Topics / Sub-topics
1	**Basic Syntactical Constructs in Java** 1.1 Features of Java. 1.2 Defining a class, Creating object, Accessing class members. 1.3 Public Static void main() function. 1.4 Java tokens and data types. 1.5 Operators and expressions. 1.6 Decision making and looping.

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	Course Outcome : CO1 **Teaching Hours :4hrs**	**Marks: 04**
2	**Derived Syntactical Constructs in Java** 2.1 Constructors and Methods 2.2 Constructor overloading , Method overloading 2.3 this keyword, variable length argument, garbage collection, finalize() method. 2.4 Visibility Controls. 2.5 Arrays and strings 2.6 Static modifier **Course Outcome : CO2,CO1** **Teaching Hours :8 hrs**	**Marks: 10**
3	**Inheritance, Interfaces and Packages** 3.1 Inheritance – Concept, types of inheritance. 3.2 Use of Super keyword 3.3 Method overriding 3.4 Dynamic method dispatch 3.5 Abstract methods and classes 3.6 Interfaces 3.7 Packages - Creating user defined packages, using packages. **Course Outcome : CO3,CO4** **Teaching Hours :10 hrs**	**Marks: 12**
4	**Exception handling and Multithreading** 4.1 Errors and Exceptions 4.1.1 try- catch 4.1.2 throw 4.1.3 throws 4.1.4 finally 4.2 User defined exceptions. 4.3 Multithreading 4.3.1 Thread life cycle	

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	4.3.2 Creating thread. 4.3.3 Thread priority **Course Outcome : CO5 Teaching Hours :6 hrs Marks: 10**
5	**Lambda Expressions and Generics** 5.1 Nested classes and Inner classes 5.2 Default methods and Functional Interfaces 5.3Introduction to lambda expression 5.4 Passing lambda expression as an arguments 5.5 Generics classes and interfaces 5.6 Type parameter, Type argument 5.7 Generic methods 5.8 Bounded generics. **Course Outcome : CO6 Teaching Hours :8 hrs Marks: 12**
6	**Files and I/O** 6.1 I/O Basics 6.2 Byte streams and Character Streams 6.3 reading/ Writing Characters. 6.4 reading / Writing bytes 6.5 Files and Directories 6.6 Creating Files/ Directories. 6.7 The java.util.Scanner class. **Course Outcome : CO2,CO1 Teaching Hours :5 hrs Marks: 08**

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7	**Collections** 7.1What is Collection in Java 7.2 Hierarchy of Collection Framework 7.3 Methods of Collection interface 7.4 Collections ❖ Iterator interface ❖ Collection Interface ❖ List Interface ❖ ArrayList ❖ LinkedList ❖ Vector ❖ Stack ❖ Queue Interface ❖ Set Interface **Course Outcome : CO7 Teaching Hours :4hrs Marks:4**

Suggested Specifications Table with Hours and Marks (Theory):

Unit No	Topic Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
1	Basic Syntactical Constructs in Java	4	0	2	2	4
2	Derived Syntactical Constructs in Java	8	0	4	6	10
3	Inheritance, Interfaces and Packages	10	2	4	6	12
4	Exception handling and Multithreading	6	2	4	4	10
5	Lambda Expressions and Generics	8	2	6	4	12
6	Files and I/O	5	2	2	4	8
7	Collections	4	2	0	2	4
	Total	**45**	**10**	**22**	**28**	**60**

Legends: R- Remember; U-Understand; A- Apply and above levels (Bloom's revised Taxonomy).

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

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List of experiments/Assignments: (Minimum 10 experiments should be performed)

Sr. No.	CO	Unit	List of Experiments	Approx. Hours
1	CO1	1	Develop a program for implementation of implicit type casting in java.	2
2	CO2, CO1	2	i) Develop a program for implementation of Constructors. ii) Develop a program for implementation of Constructor Overloading	4
3	CO2, CO1	2	Develop a program for implementation of different functions of String class.	2
4	CO2, CO1	2	Develop a program for implementation of Arrays in Java.	2
5	CO2, CO1	2	Develop a program for implementation of static modifier.	2
6	CO1	1	Develop a program for implementation of different Collections in java	2
7	CO3,	3	Develop a program for implementation of Single and Multilevel	4
	CO4		Inheritance	
8	CO3, CO4	3	Develop a program for implementation of use of super keyword.	2
9	CO3, CO4	3	Develop a program for implementation of dynamic method dispatch	2
10	CO3, CO4	3	Develop a program for implementation of Multiple inheritance using interfaces	2
11	CO3, CO4	3	Develop a program for implementation of user defined packages	4
12	CO5	4	Develop a program for implementation of Multithreading.	4
13	CO5	4	Develop a program for implementation of Exception handling.	2
14	CO5	4	Develop a program for implementation of user defined Exceptions	4
15	CO5	4	Develop a program for implementation of throws keyword in exception handling	4
16	CO6	5	Develop a program for implementation of lambda expressions in java	4
17	CO6	5	Develop a program for implementation of Generic interfaces and methods.	4
18	CO7	6	Develop a program for reading and writing characters in files. Develop a program for reading and writing bytes in files.	4
19	CO7	6	Develop a program for implementation of Scanner class3	2
20	Co7	7	Develop a program for stack and queue collections	2

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21	All	All	Mini Project	
				Total 60

CO Vs PO and CO Vs PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	2	3	1	-	1	3	1	2	2
CO2	1	3	3	2	-	3	3	2	2	3
CO3	1	3	3	2	-	3	3	3	3	3
CO4	-	3	3	2	1	3	3	3	3	3
CO5	-	3	3	2	1	3	3	3	3	3
CO6	3	3	3	1	-	1	3	1	2	2
CO7	3	3		2		1	2	3	2	3

References/ Books:

Sr. No.	Book Title	Author	Publication
1	Programming with JAVA	E. Balgurusamy	Tata McGraw-Hill
2	Java The Complete Reference10th or Later Edition	Herbert Schildt	Oracle Press,2014
3	Java * in Action, First edition	Raoul – Gabriel Urma, Mario Fusco, Alan Mycroft	Dreamtech Press, 2014

Industry Consultation Committee:

Sr. No	Name	Designation	Organisation
1	Ms. Anuradha Manakshe	Java Developer	Senior Software Developer Boston
2	Ms. Pradnya Natekar	Lecturer	Shri Bhagubai Polytechnic Mumbai
3	Ms. Namrata A. Wankhade	Lecturer in IT	Government Polytechnic Mumbai
4	Ms. Dipali B. Gosavi	Lecturer in IT	Government Polytechnic Mumbai

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Programme : **Diploma in Information Technology and Computer Engineering (Sandwich Pattern)**										
Course Code: **IT19R207**				Course Title: **Microprocessor**						
Compulsory / Optional: **Compulsory**										
Teaching Scheme and Credits				Examination Scheme						
TH	PR	TU	Total	TH (2 Hrs 30min)	TS1 (1 Hr)	TS2 (1Hr)	PR	OR	TW	Total
3	**2**	**--**	**5**	**60**	**20**	**20**	**25**	**---**	**25**	**150**

Abbreviations: L- Theory Lecture, P-Practical, TU-Tutorial, TH- Theory Paper TS1 & TS2- Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment) , * Indicates assessment by External Examiner else internal practical skill test , # indicates Self, on- line learning Mode, @ indicates on line examination

Note: For Minimum passing marks under various heads, refer, examination rule AR26. Two practical skill tests are to be conducted. First skill test at midterm and second skill test at the end of the term

Rationale:

Many people throughout the world use laptops, microcomputers, smart phones, digital assistant devices etc. All of these devices utilize a key component: a microprocessor. Microprocessor is brain of all these systems. 8086 is a 16-bit microprocessor. It is the base of all upward developed processors. It is more powerful and efficient computing machine. It overcomes all major limitations of the previous processors. It is able to get interfaced with 8-bit, 16-bit systems. This course covers architecture, signal descriptions and functioning of the 8086 microprocessor. It covers interfacing of memories and input-output devices with microprocessor. It also covers assembly language programming and at the end student will learn to design various microprocessor based systems. This will act as base for the advanced assembly language programming for next generation microprocessors.

Course Outcomes: Student should be able to

CO1	Explain architecture and signal description of 8086.
CO2	Describe the instructions and interrupts of 8086
CO3	Develop assembly language programs for 8086.
CO4	Draw timing diagrams for various instructions
CO5	Interface various memories and I/O devices to 8086 with assembly language programs for interfacing

Course Content Details:

Unit No	Topics / Sub-topics
1	**INTRODUCTION:** 1.1 Introduction to single board microcomputer Block diagram of microcomputer Elements of microcomputer

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	Different type of Buses: Address, data and control bus Types of Programming Languages and their comparison. Evolution of microprocessor Limitations of 8 bit microprocessor **Course Outcome: CO1 Teaching Hours :2 hrs Marks: 4 (R- 2, U-2, A-0)**
2	**MICROPROCESSOR 8086:** Features/Specifications of microprocessor 8086 Architecture of 8086 Register organization of 8086, concept of pipelining Memory Segmentation, 20 bit physical address generation Pin configuration and signal description of 8086 Minimum mode of 8086, address/data demultiplexing Maximum mode of 8086 **Course Outcome: CO1 Teaching Hours :8 hrs Marks: 14 (R- 6, U-8, A-0)**
3	**INSTRUCTION SET OF 8086:** Machine language instruction format Addressing modes of 8086 Instruction set of 8086 Data transfer instructions Arithmetic and logical instructions Control transfer or branching instructions String manipulation instructions Processor control instructions Bit manipulation instructions Iteration control instructions Assembler Directives **Course Outcome: CO2 Teaching Hours :9 hrs Marks: 8 (R- 2, U-6, A-0)**
4	**ASSEMBLY LANGAUGE PROGRAMMING OF 8086:** Assembler Elements of assembly language programming, Overview of assembly process, Single Pass assembler, Two pass assembler Linker and loader Opcode (machine code) generation **(no question in theory examination on this topic)** Assembly language programming of 8086 Addition, Subtraction, Multiplication, Division, Sum of series of numbers, Smallest and largest number from array, Sorting numbers in ascending and descending order, Block transfer etc. Concept of Procedure and Macros, Reentrant and Recursive procedure **Course Outcome: CO3 Teaching Hours :10 hrs Marks: 14 (R- 0, U-0, A-14)**

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5	**TIMING DIAGRAMS AND INTERRUPTS** Memory, I/O read and memory, I/O write timing diagram in Minimum mode Memory, I/O read and memory, I/O write timing diagram in Maximum mode Interrupts of 8086, hardware/software interrupts **Course Outcome: CO4, CO2 Teaching Hours :6 hrs Marks: 8 (R- 0, U-4, A-4)**
6	**MEMORY AND I/O INTERFACING** Interfacing techniques: Memory mapped I/O, I/O mapped I/O Address generation and decoding techniques Interfacing of memories (RAM, ROM, EPROM) Interfacing of 8255 Interfacing of I/O devices LEDs, Seven segment display, ADC, DAC, Stepper motor. (ALP for interfacing of above devices) **Course Outcome: CO5 Teaching Hours :10 hrs Marks: 12 (R- 0, U-0, A-12)**

Suggested Specifications Table (Theory):

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	**Introduction**	02	02		04
2	**Microprocessor 8086**	06	08		14
3	**Instruction set of 8086**	02	06		08
4	**Assembly language programming of 8086**			14	14
5	**Timing diagrams and interrupts**		04	04	08
6	**Memory and I/O interfacing**			12	12
	Total	**10**	**20**	**30**	**60**

Legends: R- Remember; U-Understand; A- Apply and above levels (Bloom's revised Taxonomy).

Notes: *This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.*

List of experiments: Total 10 experiments (or turns) out of 15 experiments (or turns)

Sr. No.	Unit No	COs	Title of the Experiments	Hours
1	2	CO1	Understand 8086 development board and simulation software	02
2	4	CO2 CO3	8086 Assembly language programming for Addition and subtraction of two 16 bit numbers	02
3	4	CO2 CO3	8086 Assembly language programming for Addition of series of 16 bit numbers	02

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4	4	CO2 CO3	8086 Assembly language programming for multi byte addition of two numbers	02
5	4	CO2 CO3	8086 Assembly language programming for multiplication of two 16 bit signed and unsigned numbers	02
6	4	CO2 CO3	8086 Assembly language programming for division of two 16 bit signed and unsigned numbers	02
7	4	CO2 CO3	8086 Assembly language programming for arranging 16 bit numbers in ascending order.	02
8	4	CO2 CO3	8086 Assembly language programming for arranging 16 bit numbers in descending order.	02
9	4	CO2 CO3	8086 Assembly language programming for block transfer of 16 bit data.	02
10	6	CO4 CO5	Interface LEDs to 8086 and develop, simulate an assembly language program to get effect of dancing light.	02
11	6	CO4 CO5	Interface seven segment display to 8086 and develop, simulate an assembly language program to display numbers from 1 to 9 on it.	02
12	6	CO4 CO5	Interface stepper motor to 8086 and develop program to rotate motor in clockwise direction.	02
13	6	CO4 CO5	Develop and simulate assembly language program for Traffic controller.	02
14	6	CO4 CO5	Interface ADC to 8086 and write ALP for it.	02
15	6	CO4 CO5	Interface DAC to 8086 and write ALP to generate square and triangular waveforms.	02

Note: Experiments No. 1, 3, 6, 11, 12 and 15 are compulsory. Remaining 4 experiments should be performed as per the importance of the topic.

References/ Books:

Sr. No.	Book Title	Author, Publisher, Edition and Year Of publication	ISBN
1	Advanced Microprocessor and Interfacing	Badri Ram, McGraw Hill Education; Error edition; July 2017	978-0070434486
2	8086 Microprocessor: Programming and Interfacing the PC	Kenneth Ayala, Delmar Cengage Learning; First edition , January 1995	978-0314012425
3	Advanced Microprocessor and Peripherals	A. K. Ray, K. M. Bhurchandi: Tata McGraw Hill Education, Third Edition 2013	978-1259006135
4	Microprocessor & interfacing (Programming & Hardware)	Douglas Hall; : Tata McGraw Hill Education, Second Edition 1992	978-0070257429

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E-References:

1. www.tutorialspoint.com/microprocessor/microprocessor_8086_overview.htm
2. www.javatpoint.com/8086-microprocessor
3. www.geeksforgeeks.org/architecture-of-8086/
4. nptel.ac.in/courses/108/103/108103157/

CO Vs PO and CO Vs PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3									
CO2	3	2	3	1	1			1		
CO3	3	3	3	3	3		3	3	3	1
CO4	3	2	1					1		
CO5	3	3	3	3	3	3	3	3	3	2

Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organisation
1	Mr. Prathmesh Mhapsekar	Software Engineer	J. P. Morgan Chase & Co.
2	Mrs. Nagargoje	Lecturer in Electronics	Govt. Polytechnic Thane
3	Mr. Vijay Patil	Lecturer in Information Technology	Vidyalankar Polytechnic Mumbai
4	Dr. R. A. Patil (Curriculum Content Designer)	Lecturer in Electronics	Govt. Polytechnic Mumbai

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Programme : **Diploma in Information Technology (Sandwich Pattern)**										
Course Code:**IT19R302**				Course Title: **Multimedia Techniques**						
Compulsory / Optional: **Compulsory**										
Teaching Scheme and Credits				Examination Scheme						
TH	PR	TU	Total	TH	TS1	TS1	PR	OR	TW	Total
01	**02**	**-**	**03**	**-**	**-**	**-**	**25***	**-**	**25**	**50**

Abbreviations: TH- Theory; PR-Practical; TU-Tutorial; TS1 and TS2- Term Tests; OR-Oral Exam; TW: Term Work (progressive assessment), * Indicates assessment by External Examiner else internal assessment
Note: For Minimum passing marks under various heads, refer, examination rule AR26.

Rationale:

For effective communication teaching, presentation multimedia is the essential feature. The Multimedia Techniques course is designed for using multimedia technology to enhance their professional skills to pursue a career in multimedia. The course focuses on specialized technical & creative skills & provides students with reflective skills. It also offers students' knowledge in theories & methodologies relevant to current industry professional practice & research.

Course Outcomes: Student should be able to

CO1	Explain different multimedia elements
CO2	Demonstrate use of different Compression, Decompression techniques
CO3	Create animations with different tools such as FLASH,MAYA
CO4	Demonstrate the use of animation, sound, video control and scanned Images
CO5	Describe multimedia Authoring System

Course Content Details:

Unit No	Topics / Sub-topics
1	**Multimedia Elements:** Evaluation of multimedia systems: Multimedia elements, Photographic Images, Geographic's information system maps, Still image processing Categorization of Multimedia Storage media: Magnetic media technology, Hard disk technology, RAID, Optical media. Multimedia applications: Document imaging, OCR, Handwrite recognize Non textual image, Digital video application & Electronic message **Course Outcome:CO1** **Teaching Hours : 3**

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2	**Compression/Decompression & File Formats** Compression and decompression: Types, Need of data compression andStill video image. Video compression technique: Simple compression technique, Interpolative, Predictive. JPEG Compression: Definition, JPEG Components and Standards File Formats: RIF,TIFF MIDI file format, AVI format Introduction to MPEG and WAV file format **Course Outcome:CO2** **Teaching Hours : 2**
3	**Multimedia I/O Technology :Audio, Video Digitalization** Multimedia System Architecture Basics of Digital Audio: Signal-to-Noise-Ratio(SNR),Signal-to-Quantization-Noise-Ratio(SQNR) Color use in Image & Video: Color Characteristics, Color models in Images and video. Fundamentals Concepts in video: Types of video signals ,Components of video, Composite video, s-video, Analog and Digital video **Course Outcome:CO3** **Teaching Hours : 3**
4	**Animation: Multimedia Tool-1 Flash** Introduction to multimedia tool & versions of flash creating and Modifying elements: Line, Text, Pen tool, different shapes Selecting lines fill with arrow tool, using lasso tool, Selecting and deselecting elements, Modifying created objects. Keyframes,timelines,Tweening Motion and Layers 4.52D versus 3D Animation. 4.6Advertisement in flash, Use & Application of flash animation software. **Course Outcome:CO4** **Teaching Hours : 2**
5	**Graphics multimedia tool-2 Photoshop & Maya** Concept of processing digital images. File formats and versions of Photoshop. Application and Use of Photoshop. Tools:Cropping & Slicing, Measuring and Navigation, Selection Typing, Video Editing. Introduction to Corel Draw. Introduction about VFX, its advantages and applications. Introduction to MAYA Tool: Overview, Components MAYA Embedded Languages, System Requirements. **Course Outcome:CO4** **Teaching Hours : 3**
6	**Multimedia Authoring And User Interface** Multimedia Authoring system and its types. Hypermedia Application and Design Consideration. User Interface Design Object Display/Playback Issue. Introduction to Distributed Multimedia Systems.

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	Course Outcome:CO5	Teaching Hours : 2

List of experiments: Total 10 experiments (or turns) out of 13 experiments (or turns)

Sr. No.	Unit No	Cos	Title of the Experiments	Hours
1	1	CO1	Classify & Analyze Characteristics, functionality and performance of different multimedia Input Output devices.	02
2	1	CO2	Demonstrate compression & decompression, different file formats	02
3	2	CO2	Design advertisement in flash with animation.	02
4	3	CO2	Develop a presentation using play, pause, stop button instances using Action Script 2.0	02
5	3	CO2	Create a presentation by using different tools in flash(Lasso, Arrow and etc)	02
6	3	CO2	Design a joker character in flash.	02
7	3	CO2	Develop an animation of joker's face by using key frames and Tween Motion(Laughing and Crying)	02
8	4	CO2	Design and develop a forest tree with flowers and fruits from a small plant using different layers & Frame Transition Time.	02
9	4	CO3	Insert audio to relevant frames that has lightning and Rain effect.	02
10	5	CO3	Create Images by using Photoshop tool.	02
11	5	CO3	Create Animation using MAYA Tool.	02
12	5	CO4	Create any project in MAYA using rendering effect.	04
13	3,4,5	CO4	Mini Project: Students should create a movie of minimum 5 minutes using Flash & Maya or Adobe Animate CC software.	04
		Total		30

References/ Books:

Sr.No	Title	Author	Publication
1	Multimedia System Design	Prabhat K Andheigh,Kiran Thakrar	Prentice Hall of India
2	Multimedia Systems	Koegel Buford	Pearson Education
3	Micromedia flash For windows & Macintosh	Katherine Ulrich	Pearson Education
4	Multimedia Communication	R.Steimnetz,K.Nahrstedt	Pearson Education

Web References:

- https://www.tutorialspoint.com/listtutorials/flash

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- http://www.nptel.ac.in/courses/106102065/33
- http://www.adobe.com/in/products/animate.html
- https://www.autodesk.in/products/maya/overview

CO Vs PO and CO Vs PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3									
CO2	3			2			1	3		
CO3	3	3	3	3	3	1	1	3	2	
CO4	3	3	3	3	3	1	1	3	2	2
CO5	3		3	2				3		2

Industry Consultation Committee:

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Head of Department
Department of Information Technology

I/C, Curriculum Development Cell

Principal

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G. P. Mumbai

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Programme : **Diploma in CE/ME/EE/EC/CO/IT/IS/LG/LT (Sandwich pattern)**										
Course Code: **HU19R102**				Course Title: **Environmental Studies**						
Compulsory / Optional: **Compulsory**										
Teaching Scheme and Credits				Examination Scheme						
TH	PR	TU	Total	TH (2 Hrs 30 min)	TS1 (1 Hr)	TS2 (1Hr)	PR	OR	TW	Total
--	**02**	--	**02**	--	--	--	--	**25**	**25**	**50**

Abbreviations: L- Theory Lecture, P-Practical, TU-Tutorial, TH- Theory Paper TS1 & TS2- Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment) , * Indicates assessment by External Examiner else internal practical skill test , # indicates Self, on- line learning Mode, @ indicates on line examination
Note: For Minimum passing marks under various heads, refer, examination rule AR 26. Two practical skill test are to be conducted. First skill test at mid term and second skill test at the end of the term

Rationale:

Technicians working in industries or elsewhere essentially require the knowledge of environmental Studies so as to enable them to work and produce most efficient, economical and eco-friendly finished products. Solve various engineering problems applying ecosystem to produce eco – friendly products. Use relevant air and noise control method to solve domestic and industrial problems. Use relevant water and soil control method to solve domestic and industrial problems. To recognize relevant energy sources required for domestic and industrial problems. Solve local solid and e-waste problems.

Course Outcomes: Student should be able to

CO1	Understand the ecosystem and terminology and solve various engineering problems applying ecosystem knowledge to produce eco – friendly products.
CO2	Understand the suitable air, extent of noise pollution, and control measures and acts.
CO3	Understand the water and soil pollution, and control measures and acts.
CO4	Understand different renewable energy resources and efficient process of harvesting.
CO5	Understand Solid Waste Management & E Waste Management, ISO 14000, 45001 & Environmental Management.

Course Content Details:

Unit No	Topics / Sub-topics
1	**Ecosystem** Structure of ecosystem, biotic & Abiotic components Food chain and food web Aquatic (Lentic and Lotic) and terrestrial ecosystem Carbon, Nitrogen, Sulphur, Phosphorus cycle Global warming -Causes, effects, process, Green House Effect, Ozone depletion **Course Outcome: CO1 Teaching Hours : 6 hrs Marks: 03 (R- NA, U-NA, A- NA)**
2	**Air and Noise Pollution** Definition of pollution and pollutant, Natural and manmade sources of air pollution (Refrigerants, I.C., Boiler) Air Pollutants: Types, Particulate Pollutants: Effects and control (Bag filter, Cyclone

	separator, Electrostatic Precipitator) Gaseous Pollution Control: Absorber, Catalytic Converter, Effects of air pollution due to Refrigerants, I.C., Boiler Noise pollution: sources of pollution, measurement of pollution level, Effects of Noise pollution **Course Outcome: CO2 Teaching Hours : 6 hrs Marks: 05 (R- NA, U-NA, A- NA)**
3	**Water and Soil Pollution** Sources of water pollution, Types of water pollutants, Characteristics of water pollutants Turbidity, pH, total suspended solids, total solids BOD and COD: Definition Waste Water Treatment: Primary methods: sedimentation, froth floatation, Secondary methods: Activated sludge treatment, Trickling filter, Bioreactor, Tertiary Method: Membrane separation technology, RO (reverse osmosis) Causes, Effects and Preventive measures of Soil Pollution : Causes – Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation, E-waste Mangroves : Importance, benefits. **Course Outcome:CO3 Teaching Hours : 6 hrs Marks: 05 (R- NA, U-NA, A- NA)**
4	**Renewable sources of Energy** Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flatplate collector. Importance of coating. Advanced collector. Solar pond. Solar water heater, solar dryer. Solar stills. Biomass: Overview of biomass as energy source. Thermal characteristics of biomass as fuel. Anaerobic digestion. Biogas production mechanism. Utilization and storage of biogas Wind energy: Current status and future prospects of wind energy. Wind energy in India.Environmental benefits and problem of wind energy New Energy Sources: Need of new sources. Different types new energy sources. Applications of (Hydrogen energy, Ocean energy resources, Tidal energy conversion) Concept, origin and power plants of geothermal energy **Course Outcome:CO4 Teaching Hours : 6 hrs Marks:05 (R- NA, U-NA, A- NA)**
5	**Solid Waste Management OR E- Waste Management, ISO 14000 & Environmental Management** **For Civil Engineering :** Solid waste generation- Sources and characteristics of : Municipal solid waste, E- waste, biomedical waste. Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries. Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill), Hazardous waste Air quality act 2004, air pollution control act 1981 and water pollution and control act1996. Structure and role of Central and state pollution control board. Concept of Carbon Credit, Carbon Footprint. Environmental management in fabrication industry. ISO14000: Implementation in industries, Benefits, ISO 45001:2018 Role of MPCB in factory permit. Green pro IGBC certification, its benefits **OR** **For Computer Engineering & Information Technology :** E-Waste Electronic products which have become unwanted, non-working, obsolete E-Waste Management Services Separation of E-Waste from other waste

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Categorization of E-Waste into old working equipments, old computers, non-working components
Authorized Recycling Facilities
Refurbishing

OR

For Electrical Engineering :
Various e-waste sources, their constituents, and health impacts
e-Waste Problem in India
Initiatives on building awareness in e-waste management.
Current Status of e-Waste Management & Environmental (Protection) Act 1986
Development of waste recycling technologies.
Opportunities of e-Waste Management in India
e-Waste Management techniques

OR

For Electronics Engineering & Instrumentation Engineering :
Solid waste generation- Sources and characteristics of : E- waste, biomedical waste.
Toxicity due to hazardous substances in E waste and their impact
Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries.
Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill), Hazardous waste
Domestic E waste disposal and E waste management
Air quality act 2004, air pollution control act 1981 and water pollution and control act1996. Structure and role of Central and state pollution control board.
Concept of Carbon Credit, Carbon Footprint.

OR

For Leather Technology/ Leather Goods & Footware Technology :
Solid waste generation- Sources and characteristics of : Municipal solid waste, E- waste, biomedical waste.
Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries.
Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill), Hazardous waste
Air quality act 2004, air pollution control act 1981 and water pollution and control act1996. Structure and role of Central and state pollution control board.
Concept of Carbon Credit, Carbon Footprint.
Environmental management in fabrication industry.
ISO14000: Implementation in industries, Benefits.
Solid waste management in leather and footwear industries

Course Outcome:CO5 Teaching Hours : 6 hrs Marks:07(R- NA, U-NA, A- NA)

Note : Chapter 5 should be teach as per department mentioned.

List of tutorials:

Sr. No.	Unit No	COs	Title of the Experiments	Hours
1	1,2,3, 4,5	CO1,CO2, CO3,CO4, CO5	Prepare a write up on each unit (altogether 5 in number) that summarizes the whole unit and presents important points on it.	14
2	2,3	CO2,CO3	Visit to a local polluted site : Urban/Rural/Industrial/Agricultural and prepare a report	4

			based on visit.	
3	4	CO4	Visit to biomass plant and prepare a report based on visit.	6
4	5	CO5	Visit to municipal solid waste management organization or an authorized e-waste recycling plant and prepare a report based on visit.	6
		Total		30

References/ Books:

Sr. No.	Title	Author, Publisher, Edition and Year Of publication	ISBN
1	Environmental Studies	S.C. Sharma & M.P. Poonia Khanna Publishing House, New Delhi	ISBN: 978-93-86173-09-6
2	Understanding Chemistry	C.N.Rao Universities Press(India) Pvt. Ltd. 2011	ISBN:13-9788173712500
3	Waste water treatment for pollution control and reuse	Arceivala, Soli Asolekar, Shyam Mc-Graw Hill Education India Pvt. Ltd. New york, 2007	ISBN:978-07-062099
4	Elements of Environmental Pollution control	O.P.Gupta Khanna Publishing House, New Delhi	ISBN:13-9789382609667

E-References:

1) www.eco-prayer.org
2) www.teriin.org
3) www.cpcp.nic.in
4) www.cpcp.gov.in
5) www.indiaenvironmentportal.org.in
6) www.whatis.techtarget.com
7) www.sustainabledevelopment.un.org
8) www.conserve-energy-future.com
9) http://www.nationallibrary.gov.in

CO Vs PO and CO Vs PSO Mapping (Civil Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	3	3	--	--	1
CO2	3	3	2	2	3	3	3	--	1	1
CO3	3	3	2	2	3	3	3	--	1	1
CO4	3	3	2	2	3	3	3	--	1	1
CO5	3	3	2	2	3	3	3	--	1	1

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CO Vs PO and CO Vs PSO Mapping (Mechanical Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	2	1	3	3	3	--	1
CO2	3	3	2	2	3	3	3	--	--
CO3	3	3	2	2	3	3	3	--	--
CO4	3	3	2	2	3	3	3	--	--
CO5	3	3	2	2	3	3	3	--	--

CO Vs PO and CO Vs PSO Mapping (Electrical Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	3	3	--	--	3
CO2	3	3	2	2	3	3	3	--	--	2
CO3	3	3	2			3	3	--	--	2
CO4	3	3	2			3	3	--	--	2
CO5	3	3	2			3	3	--	--	2

CO Vs PO and CO Vs PSO Mapping (Electronics Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1		3	3	--	--	2
CO2	3	3	2			3	3	--	--	--
CO3	3	3	2			3	3	--	--	--
CO4	3	3	2	2		3	3	--	--	2
CO5	3	3	2	2			3	--	--	1

CO Vs PO and CO Vs PSO Mapping (Instrumentation Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3	2	2	1	3	3	3	--	--
CO2	3	3	2	2	3	3	3	--	--
CO3	3	3	2	2	3	3	3	--	--
CO4	3	3	2	2	3	3	3	--	--
CO5	3	3	2	2	3	3	3	--	--

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CO Vs PO and CO Vs PSO Mapping (Computer Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	3	3	--	--	--
CO2	3	3	2	2	3	3	3	--	--	--
CO3	3	3	2	2	3	3	3	--	--	--
CO4	3	3	2	2	3	3	3	--	--	--
CO5	3	3	2	2	3	3	3	--	--	--

CO Vs PO and CO Vs PSO Mapping (Information Technology)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	3	3	--	3	--
CO2	3	3	2	2	3	3	3	--	2	--
CO3	3	3	2			3	3	--	2	--
CO4	3	3	2			3	3	--	2	--
CO5	3	3	2			3	3	--	3	--

CO Vs PO and CO Vs PSO Mapping (Leather Technology)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1		3	3	--	--	1
CO2	3	3	2			3	3	--	--	--
CO3	3	3	2			3	3	--	--	--
CO4	3	3	2	2		3	3	--	--	--
CO5	3	3	2	2			3	--	--	--

CO Vs PO and CO Vs PSO Mapping (Leather Goods & Footware Technology)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	1	3	3	3	--	--	1
CO2	3	3	2	2	3	3	3	--	--	--
CO3	3	3	2	2	3	3	3	--	--	--
CO4	3	3	2	2	3	3	3	--	--	--
CO5	3	3	2	2	3	3	3	--	--	--

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Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organisation
1	Mr. Rohan Deokar	Deputy Engineer	MMRDA
2	Mr. Sanjay Kulkarni	Surveyor and Consultant	SRKulkarni Pvt.Firm
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Principal

GPM
ESTD. 1960
GOVERNMENT POLYTECHNIC MUMBAI
MAKING KNOWLEDGE TO WORK

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CDC Co-ordinator
G. P. Mumbai

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Programme : **Diploma in ME/CE/EE/CO/IF/IS/EC/RT/LT/LG (Sandwich Pattern), AIML**										
Course Code: UV19R103				Course Title: Universal Human Values-III						
Compulsory / Optional: Compulsory										
Teaching Scheme and Credits				Examination Scheme						
L	P	TU	Total (Credit)	TH (2 Hrs 30min)	TS1 (1 Hr)	TS2 (1Hr)	PR	OR	TW	Total
--	--	-	**02**	-	-	-	--	-	--	--

Abbreviations: L- Theory Lecture, P-Practical, TU-Tutorial, TH- Theory Paper TS1 & TS2- Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment), * Indicates assessment by External Examiner else internal practical skill test, # indicates Self, on- line learning Mode, @ indicates online examination
Note: For Minimum passing marks under various heads, refer, examination rule AR26.Two practical skill tests are to be conducted. First skill test at mid-term and second skill test at the end of the term.

Rationale:

This course aims to cultivate essential human values and ethics in students to become responsible citizens. It fosters understanding of virtues advocated by great Indian philosophers like truth, non-violence, morality and social responsibility. Students apprehend philosophies of thinkers like Mahatma Gandhi, Swami Vivekananda and Bharat Ratna Dr.Babasaheb Ambedkar; develop courage, patience and dignity through experiences of loyalty and duty; and practice yoga for well-being.

Adopting discussions, debates, visits, reports and applications, the course transforms students into strong, sensitive and virtuous members of society with high moral character and social conscience. In essence, it promotes human values, inculcates ethics and develops the best citizens of India.

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Course Outcomes: On completion of this course, student should be able to

CO1	Express gratitude through compassionate service and unconditional giving.
CO2	Spread hope, optimism and cheer through positive words and deeds.
CO3	Understand responsibilities towards the planet, fellow beings and future generations.
CO4	Internalize lessons from great souls who exemplified nobility, courage and righteousness.
CO5	Appreciate life as sacred and valuable; and pursue meaning, purpose and peace.
CO6	Develop holistic well-being through balancing individual needs with common good.

Course Content Details:

Sr. No	Activity	Related Value/s	Methodology of Implementation	Student's Role	Mentor's role	Resources Required
01	Read and create abstract of biography like, 1. ek hota carver 2.Biography of a yogi 3. JRD Tata 4. Mahatma Gandhi 5. Pant pratinidhi 6. Shriman Yogi	Righteousness	Visit library, find out books, read and prepare the report	Students will need to select a biography to read and create an abstract that summarizes the key ideas and messages in the biography.	Mentors will need to provide guidance and support to help students select an appropriate biography and create a well-written abstract.	Access to a library or online resources to select a biography to read and create an abstract.
02	NDRF one day training OR Police Mitra training OR Red cross training OR Fire safety training OR Self defense training for Girls OR CPR training	Accountability Empathy	Plan training with the help of related agencies	Students will need to attend a one-day training session.	Mentors will need to provide guidance on attending the selected training session and ensuring safety.	Access to training facilities and materials may be necessary.

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03	Debate on a particular topic among group of students	Clarity of thoughts Politeness	Prepare small groups of students, Choose topics. Avoid controversial topics	Students will need to participate in a debate on a given topic and follow the rules for participation.	Mentors will need to provide guidance on debate topics and rules for participation and provide feedback on students' performance.	A list of debate topics and rules for participation may be required.
04	List different incidents witnessed by you related to loyalty and write a report on it	Loyalty	List related incidents, discuss with mentor and write report.	Students will need to observe and report on incidents related to loyalty and submit a report summarizing their findings.	Mentors will need to provide guidelines on what should be included in the report and provide feedback on students' observations.	A template for the report or guidelines on what should be included may be helpful.
05	Analyse behaviour pattern of self and group member while performing any group activity	Harmony in behavior	List different group activities, select anyone from the list and perform it.	Students will need to analyze their own behavior and that of their group members during a group activity and record their observations.	Mentors will need to provide guidance on observing and recording behavior patterns and provide feedback on students' observations.	Guidelines for observing and recording behavior patterns may be necessary.

GOVERNMENT POLYTECHNIC GPM MAKING KNOWLEDGE TO WISE

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06	Visit tribal area and spread awareness about sanitary practices,hygiene and education	Empathy Social Gratitude Selflessness	List nearby tribal areas and prepare detailed plans.	Students will need to plan and conduct an awareness campaign in a tribal area to educate the local community on a selected topic.	Mentors will need to provide guidance on planning and conducting an awareness campaign and provide feedback on students' materials and presentations.	Materials for creating educational materials or presentations may be needed.
07	Visit websites of reputed industries and study their Corporate Social Responsibility (CSR) activities. Also arrange an interview of a successful entrepreneur.	Social Gratitude Accountability	Visit CSR section of the website of selected industry	Students will need to research and report on the CSR activities of a selected industry.	Mentors will need to provide guidance on researching and reporting on CSR activities and provide feedback on students' reports.	Access to the internet or relevant industry publications may be required.
08	1.Seven blunders told by Mahatma Gandhi and practice them as an ethic in your daily life to be a moral citizen. 2. Swami Vivekananda and his philosophy 3.Bharatratna Dr Babasaheb Ambedkar and his philosophy, teachings Any other social reformer	Character Humanity Sacrifice Honesty Accountability Patriotism	Select anyone topic. Prepare Group presentations on selected topic.	Students will need to prepare and present a group presentation on a selected topic.	Mentors will need to provide guidance on preparing and presenting a group presentation and provide feedback on students' presentations.	

GOVERNMENT POLYTECHNIC MUMBAI GPM ESTD. 1960 MAKING KNOWLEDGE TO WORK

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09	Understanding Eight limbs (Ashtanga) of Yoga for gaining the best mental health.	Health consciousness Social gratitude	Arrange the session of a meditation expert to understand the philosophy of Yoga.	Students will need to understand and practice the principles of the eight limbs of yoga. Practice it daily for the best physical and mental health.	Mentors will need to provide guidance on understanding and practicing the principles of the eight limbs of yoga and provide feedback on students' progress.	Resources such as yoga mats or printed materials on the eight limbs of yoga may be required.
10	Eight-fold ashtangik path for cessation of sufferings OR Vipassana	Truthfulness Non-violence Contentment Persistence	To understand the philosophy and its use to stop suffering	After understanding share the experiences with others. Apply it in your daily life.	Provide related resources	https://en.wikipedia.org/wiki/Ashtanga_(eight_limbs_of_yoga)
11	Writing daily diary	Honesty Punctuality	Student to write diary every day	Students will need to write a daily diary entry reflecting on their thoughts, feelings, and experiences.	Mentors will need to check and provide feedback on daily diary entries to encourage reflection and self-awareness.	Each student will need a notebook or journal.

Methodology:

1. The course is Non Examination, Credit Course.
2. The course will be introduced during the student induction programme (orientation programme) of one week duration. Most of the activities are to be completed during induction programme and to be continued throughout the term during SCA hours under the guidance of mentor.
3. The mentor will be assigned to the student for a group of 20 students each.

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4. In consultation and under supervision of a mentor, the student/ Group of students has to complete the activity.
5. Activities no. 6,7, 9 and 10 can be performed in collaboration with related government organizations or industries (under CSR activity).
6. All events will be organized and managed by students. The mentor will work as a facilitator/ advisor.
7. The strategies to learn the course is "Self- Exploratory" and "Experiential Learning"
8. The onus of responsibility for completing the activities is with students.
9. The student has to complete at least **five** no. of activities throughout the term to earn the credits.
10. Activity no.6 is compulsory.
11. Students will write reports on each activity performed and submit it to mentors to earn credits.

References/ Books:

Sr. No.	Title	Author, Publisher, Edition and Year Of publication	ISBN
1	A Foundation Course in Human Values and Professional Ethics	R.R. Gaur, R. Sangal, G.P. Bagaria, Excel Books, New Delhi, 2010	978-8-174-467 81-2
2	Human Values	A.N. Tripathy, New Age International Publishers, 2003	978-8-122-425 89-5
3	Teacher's Manual - A Foundation Course in Human Values and Professional Ethics	R.R. Gaur, R. Sangal, G.P. Bagaria, Excel Books, New Delhi, 2010	-
4	Science and Humanism, Towards a Unified World View	PL Dhar, RR Gaur, Commonwealth Publications, 1992	978-8-171-692 22-4
5	Education for values in schools- a framework	NCERT	
6	Value oriented education	E N Gawande	
7	Autobiography of a Yogi	Paramahansa Yogananda, Yogoda Satsanga Society of India; Complete edition (9 February 1998)	978-818953551 3
8	Teachings of Swami Vivekananda	Swami Vivekanada, Vedanta Pr; Fifth edition (1 June 1971)	978-818530187 7

E-References:

1) https://youtu.be/kOJu1vj_BVk **(The 10 Most Important Human Values)**
2) https://youtu.be/QeogOlzG2ls **(Value of Education -short film)**

E-References for mentors:

1) **https://www.edutopia.org/**
2) **https://en.wikipedia.org/wiki/Seven_Social_Sins**

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