Shri Vaishnav Vidyapeeth Vishwavidyalaya

Master of Technology (Digital Communication/Embedded System)

SEMESTER I

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
MTMAEC 101	BS	Advanced Mathematics	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Objective

To introduce the students with the Fundamentals of the Advanced Mathematics

Course Outcomes

After the successful completion of this course students will be able to:

1. *Understand and apply the basics of the numerical and analytic techniques of solution PDE, various transforms which are fundamental of almost every subject of Electrical, Electronics and Telecommunication Engg.*
2. *Know the fundamental principles of the Modern probability theorems and Statistics, Stochastic or Random Processes, Fuzzy set and logic, Matab programming.*
3. *Apply the approaches of Reliability engineering, Decision theory and Goal programming which play significant role in the subjects of modern engineering and Technology.*

Course Content:

UNIT – I

Partial Differential Equations and various Transforms:

Solution of PDE by separation of variable method, Numerical solution of PDE using finite difference method, Elementary properties of FT, DFT, Wavelet transform, WFT, Haar transform.

UNIT – II

Probability & Statistics:

Probability, Compound probability, Discrete Random variable, Binomial and Poisson distribution, Continuous Random variable, Normal distribution, Sampling distribution, Theory of hypothesis.

UNIT – III

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Stochastic or Random Process:
Introduction of Random or Stochastic processes, Markov Processes, Markov chain, Queuing theory: $M/M/1:\infty/FCFS, M/M/N:\infty/FCFS$.

UNIT – IV
Fuzzy Set and Theorems:
Fuzzy set, Fuzzy relation, Fuzzy arithmetic, Fuzzy logic, Introduction of MATLAB, MATLAB Programming, functions and applications.

UNIT – V
Reliability:
Introduction of Reliability, derivation of reliability functions, Failure rate, mean time to failure and applications, Decision theory, Goal programming.

Texts:

1. B. S. Grewal, "Higher Engg. Mathematics", Khanna Publishers, Delhi.

References:

1. Ervin Kreszig, "Advance Engineering Mathematics", John Wiley & Sons (Asia) Pvt. Ltd.
2. S. D. Sharma, Kedar Nath, Ram Nath, "Operation Research", Delhi.
3. Probability, Random variables & Random processes: Schaum's outlines.
4. J. Medhi, "Stochastic processes", New Age International Publishers
5. Gupta, Malik, "Calculus of finite differences and Numerica Analysis".
6. J. N. Sheddon, "Fourier Transform".
7. T. J. Ross, "Fuzzy logic in Engineering".
8. H. J. Zimmersoms, "Fuzzy set theory and its applications".
9. Pran Nath, "Statistics, Reliability and Decision making for Engineers", Tara Printing works.

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Choice Based Credit System (CBCS) in the Light of NEP-2020
M.Tech. in Embedded System
(2021-2023)

COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTES124	DCC	Embedded System Designing using Raspberry pi	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Educational Objectives (CEOs):

1. To describe the basic functionality of Raspberry Pi B+ board.
2. To present the basics of the Python programming language to prepare students for programming on the Raspberry Pi.
3. To communicate with devices through the pins of the Raspberry Pi.

Course Outcomes (COs):

After completing this course, students will be able to:

1. Setup and operate the Raspberry Pi
2. Understand the basics of the Linux OS used on the Pi and the basics of the X Windows System (the GUI environment)
3. Program the Pi for different applications

Syllabus

UNIT I **8 Hrs.**

Introduction to Raspberry Pi

History of Raspberry Pi, Raspberry Pi Architecture, BCM2835 CPU overview, CPU pipeline overview, Raspberry Pi board resources, Raspberry Pi GPIO pins.

UNIT II **8 Hrs.**

Introduction: Need of Python Programming, Running Python Scripts, Variables, Assignment, Operators and Expressions: Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Expressions and order of evaluations.

UNIT III **8 Hrs.**

Data Structures: Lists, Tuples, Sets, Dictionaries, Sequences. **Control Flow** - if, if-elseif-else, for, while, break, continue. **Functions** - Defining Functions, Calling Functions, Passing Arguments. **Modules**: Creating modules, import statement, from import statement, name spacing.

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UNIT IV **8 Hrs.**

Python packages, Introduction to PIR Installing Packages via PIR Using Python Packages Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data Hiding.

UNIT V **8 Hrs.**

Python IDE for Raspberry Pi, Python expressions, functions and operations for controlling the pins of Raspberry Pi, File Handling: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data.

Text Books:

1. Adrian McEwen, Hakim Cassimally, “Designing the Internet of Things”, John Wiley & Sons, 2013
2. Wolfram Donat “Learn Raspberry Pi programming in python”, A press ,2014

References:

1. Richard Grimmett, “Raspberry Pi Robotics Essentials”, Packet Publishing Ltd 2015

List of Experiments:

1. Understanding Python IDE and Raspberry Pi board.
2. Understanding Raspberry Pi Board Architecture.
3. Installing and configuring Raspbian OS on Raspberry Pi.
4. Blinking LED using Raspberry Pi.
5. Network configuration on Raspberry Pi.
6. Interfacing Sensor using Raspberry Pi.
7. Develop programs to understand the control structures of python.
8. Write a Python program to get a list, sorted in increasing order by the last element in each tuple from a given list of non-empty tuples: Sample List: [(2, 5), (1, 2), (4,4), (2,3), (2,1)] Expected Result: [(2, 1), (1, 2), (2, 3), (4, 4), (2, 5)]
9. Write a Program that Reads a Text File and Counts the Number of Times a Certain Letter Appears in the Text File.
10. Write a Program to find the most frequent words in a text read from a file.

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MTES102	DCC	Microcontrollers and Interfacing	60	20	20	30	20	2	0	2	3

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Course Educational Objectives (CEOs):

1. To understand the architecture of various 8-bit controllers.
2. To understand the concepts of various interfaces to the controller.
3. To obtain hands-on experience in programming microcontroller.

Course Outcomes (COs):

The student will be able to

1. Understand the architecture of 8 bit controllers.
2. Design embedded system using 8 bit microcontroller

Syllabus:

UNIT I **8 Hrs.**

INTEL 8051 microcontroller: Architecture of 8051, Memory Organization, Register banks, Bit addressing media, SFR area, addressing modes, Instruction set, Programming examples. 8051 Interrupt structure, Timer modules, Serial Features, Port structure, and Power saving modes.

UNIT II **8 Hrs.**

Interrupts and communication Protocol: Interrupts in 8051, interrupt types, steps in interrupt processing, IE special function register , IP special function register, priority of interrupts, Serial I/O Devices, RS232 specifications, SPI and I2C communication protocols.

UNIT III **7 Hrs.**

AVR microcontroller: Features and applications, Types, Architecture, Internal Architectural Block diagram of controller (Atmega 8). Functions of each pins of ATmega8, Addressing modes, Instruction set, Configuration of Timers and Counters.

UNIT IV **7 Hrs.**

Configuration of AVR and Essential Peripheral circuits: Crystal Circuit, Power supply, Oscillator Circuit Initial programming configurations of Atmega8: port, counter, timer. Boot-Loader Circuit, ISP of Atmega 8 and Atmega328.

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MTES102	DCC	Microcontrollers and Interfacing	60	20	20	30	20	2	0	2	3

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UNIT V **8 Hrs.**

Microcontroller interfacing: Interfacing with LEDs, Seven Segment, Sensors, basic concepts and interfacing of LCD, ADC, DAC, Relays and External Memory Interface.

Text Books:

1. M.A. Mazidi & J.G. Mazidi, "The 8051 Micro Controller & Embedded Systems", Pearson Education. Asia (2000).
2. Muhammad Ali Mazidi, Sarmad Naimi, Sepehr Naimi, "AVR Microcontroller and Embedded Systems: Using Assembly and C", Pearson New International Edition.
3. Kenneth J. Ayala, " The 8051 Microcontroller", Thomson Delmar Learning, third edition, 2005

References:

1. "8-bit Embedded Controllers Handbook", INTEL Corporation 1990.
2. Jonathan W. Valvano, "Embedded Microcomputer systems, Real Time Interfacing", 3rd edition, Cengage learning, 2011.

List of Experiments:

1. Write a program using Data Transfer Instructions
2. Write a program using Arithmetic Instructions
3. Write a program using Logical Instructions
4. Write a program using Jump Instructions
5. Write a program using Loops for Delay
6. Write a program for LED interfacing
7. Write a program for RGB LED for Glowing Alternate patterns
8. Write a program to Display numbers and alphabets on 7 segment display
9. Write a program to generate waves with different duty cycles
10. Write a program to handle Interrupts.
11. Write a program for understanding communication protocols

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SEMESTER-III

MBAI301C ADVANCED HUMAN VALUES AND PROFESSIONAL ETHICS

SUBJECT CODE	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	P	CREDITS
		END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MBAI301C	Advanced Human Values and Professional Ethics	60	20	20	-	-	4	-	-	4

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Course Objective

The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of "right" and "good" in individual, social and professional context

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. Help the students to understand right conduct in life.
2. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect personal and professional life.

COURSE CONTENT

Unit I: Inculcating Values at Workplace

1. Values: Concept, Sources, Essence
2. Classification of Values.
3. Values in Indian Culture and Management: Four False Views, Value Tree
4. Eastern and Western Values; Values for Global Managers

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Unit II: Professional Ethics

1. Ethics: Concept, Five P's of Ethical Power, Organisational Tools to Cultivate Ethics
2. Theories of Ethics: Teleological and Deontological
3. Benefits of Managing Ethics in an Organisation
4. Ethical Leadership

Unit III: Indian Ethos and Management Style

1. Indian Ethos and Workplace
2. Emerging Managerial Practices
3. Ethical Considerations in Decision Making and Indian Management Model
4. Core Strategies in Indian Wisdom and Ethical Constraints

Unit IV: Human Behavior – Indian Thoughts

1. Guna Theory
2. Sanskara Theory
3. Nishkama Karma
4. Yoga: Types, Gains; Stress and Yoga

Unit V: Spirituality and Corporate World

1. Spirituality: Concept, Paths to Spirituality
2. Instruments to achieve spirituality
3. Vedantic Approach to Spiritual and Ethical Development
4. Indian Spiritual Tradition.

Suggested Readings

1. Kausahl, Shyam L. (2006). ***Business Ethics – Concepts, Crisis and Solutions***. New Delhi: Deep and Deep Publications Pvt. Limited
2. Murthy, C.S.V. (2012). ***Business Ethics –Text and Cases.*** Himalaya Publishing House: Mumbai
3. Chakraborty, S. K. (1999). ***Values and Ethics for Organizations***. Oxford university press
4. D.Senthil Kumar and A. SenthilRajan (2008). ***Business Ethics and Values.*** Himalaya Publishing House: Mumbai

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MTES115	DSE	Cryptography and Network Security	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):

1. To understand basics of security and various Cryptographic Methods.
2. To be able to secure a network over insecure channel by various means.
3. To understand various attacks for system security and its counter measures to protect against the threats in the networks.

Course Outcomes (COs):

After completion of this course the students are expected to be able

1. Provide security of the data over the network.
2. Implement various methods for the system security.
3. Apply necessary approaches and techniques to build protection mechanisms to secure computer networks.

Syllabus

UNIT I **9 Hrs.**

Basics of Security

Introduction to Security Aspects: Security Trends, Security attacks, Security services, Security Mechanism, Model for Network Security

Classical Encryption Techniques: Substitution Techniques, Transposition Techniques

Elements of finite fields: Groups, Rings and Fields, Euclidean Algorithm

UNIT II **8 Hrs.**

Symmetric Ciphers

Block Ciphers: Data Encryption Standard, Strength of DES, Advance Encryption Standard, Multiple Encryption and Triple DES, Block Cipher modes of operation, Stream Cipher

Confidentiality using symmetrical Encryption: Traffic Confidentiality, Random Number Generation

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MTES115	DSE	Cryptography and Network Security	60	20	20	0	0	3	0	0	3

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UNIT III **8 Hrs.**

Public Key Encryption and Hash Function

Public Key Cryptography: Fermat's and Euler's Theorem, The Chinese Remainder Theorem, Principle of Public Key Cryptosystem, RSA algorithm

Key Management: Diffie Hellman Key Exchange, Elliptical Curve Cryptography

Message Authentication and Hash Function: Message Authentication Codes, Hash Functions, Security of Hash Functions and MACs, Digital Signature

UNIT IV **9 Hrs.**

Network Security Applications

Authentication Applications: Kerberos, X.509 Authentication Service

E-Mail Security: Pretty Good Privacy, S/MIME

IP Security: IP Security Architecture, Key Management

Web Security: Secure Socket Layer, Transport Layer Security,

UNIT V **8 Hrs.**

System Security

Intruders: Intrusion Detection, Password Management

Malicious Software: Viruses, Threats, Virus Counter measures, Distributed Denial of Service Attack

Firewalls: Firewall Design Principles, Trusted Systems, IT Security Evaluation

Text Books:

1. William Stalling, "Cryptography and Network Security - Principles and Practice", 7th Edition-Pearson , 2017
2. Behrouz A. Forouzan, "Cryptography and Network Security", McGraw- Hill , 2007

References:

1. Atul Kahate , "Cryptography and Network Security", 4th Edition McGraw-Hill , 2003
2. Prakash Gupta , "Cryptography and Network Security", PHI Learning 2015

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MTES114	DSE	Data Acquisition Systems	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):

1. To know about the types of transducers and the function of Data Acquisition system.
2. To understand various signal conditioning methods.
3. To gain information about various types of filters and their working.
4. To learn about different conversions such as ADC and DAC.
5. To understand the concept of interfacing.

Course Outcomes (COs):

The students will be able to

1. Summarize the working of various data acquisition and transmission systems.
2. Categorize different amplifiers and couplers.
3. Outline various filters by their operation and construction.
4. Classify various conversion methods and interfacing.

Syllabus

UNIT I **9 Hrs.**

DAS Introduction: Data Acquisition Systems (DAS), Introduction, Objective, Block Diagram Description of DAS, General configurations, Single and multichannel DAS, Transducers for the measurement of motion, force, pressure, flow, level, dc and ac voltages and currents, Hall Effect Current Sensors, High Voltage Sensors , Optosensors, Rogowski Coil, Ampflex Sensors.

UNIT II **8 Hrs.**

Signal Conditioning: Requirements, Instrumentation amplifiers, Basic characteristics, Chopped and Modulated DC Amplifiers Isolation amplifiers, Opto couplers, Buffer amplifiers, Noise Reduction Techniques in Signal Conditioning, Transmitters, Optical Fiber Based Signal Transmission, Piezoelectric Couplers, and Intelligent transmitters.

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MTES114	DSE	Data Acquisition Systems	60	20	20	0	0	3	0	0	3

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UNIT III **9 Hrs.**

Filtering: First and second order filters, classification and types of filters, Low-pass, High-pass, Band-pass and Band-rejection and All Pass, Butterworth, Bessel, Chebyshev and Elliptic filters, Operational amplifier, RC Circuits for Second Order Sections, Design of Higher Order Filters using second order sections using Butterworth Approximation, Narrow Band pass and Notch Filters and their application in DAS,

UNIT IV **8 Hrs.**

Signal Conversion and Transmission: Analog-to-Digital Converters (ADC), Conversion Processes, Speed, Quantization Errors, Successive Approximation ADC, Dual Slope ADC, Flash ADC, Digital-to-Analog Conversion (DAC) Techniques, Speed Conversion, Post Filtering, Weighted Resistor, R-2R, Weighted Current type of DACs, Multiplying Type DAC, Bipolar DACs,

UNIT V **8 Hrs.**

Digital Signal Transmission and Interfacing: DAS Boards, Introduction, Study of a representative DAS Board-Interfacing Issues, I/O vs Memory Addressing, Software Drivers, Virtual Instruments, Bus standard for communication between instruments, GPIB (IEEE-488bus), RS232C USB, 4-to-20mA current loop serial communication systems, Communication via parallel port, Interrupt based Data Acquisition.

Text Books:

1. Murty D V S, “Transducers & Instrumentation”, PHI, New Delhi, 2016.
2. Ernest O Doeblin, “Measurement Systems: Application and Design”, 5th Edition McGraw Hill, 2004.
3. George C. Barney, “Intelligent Instrumentation”, Prentice Hall of India Pvt Ltd., New Delhi, 1988.
4. Ibrahim, K.E., “Instruments and Automatic Test Equipment”, Longman Scientific & Technical Group Ltd., UK, 1988

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MTES114	**DSE**	**Data Acquisition Systems**	60	20	20	0	0	3	0	0	3

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References:

1. H S Kalsi, "Electronic Instrumentation", TMH, New Delhi , 2012.
2. Patranabis, "Principles of Industrial Instrumentation", 3rd Edition., TMH, 2009.
3. A. K Ray, K.M. Bhurchandi "Advanced Microprocessors and Peripherals", Tata McGraw Hill, 3rd Edition, 2012.
4. Oliver Cage, "Electronic Measurements and Instrumentation", McGraw-Hill, (Int. edition) 1975.

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MTES101	DCC	Digital VLSI Design	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):

1. Be able to use mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits, including logic components and their interconnects.
2. Be able to create models of moderately sized CMOS circuits that realize specified digital functions.
3. Be able to apply CMOS technology-specific layout rules in the placement and routing of transistors and interconnect, and to verify the functionality, timing, power, and parasitic effects.
4. Have an understanding of the characteristics of CMOS circuit construction

Course Outcomes (COs):

1. Be able to complete a significant VLSI design project having a set of objective criteria and design constraints.
2. To design static CMOS combinational and sequential logic at the transistor level, including mask layout.
3. Use different analysis and verification tools, implementation and synthesis methodologies and testability techniques that will enable them to design high performance and efficient digital systems.
4. Design digital systems for a variety of applications, including microcomputers and special purpose computing systems

Syllabus:

UNIT I **8 Hrs.**

Fundamental of MOS Transistor its Characteristic under Static and Dynamic Conditions, MOS Transistor Secondary Effects, Process Variations, Technology Scaling, CMOS Inverter -Static Characteristic, Transient response, Logical effort and Power Dissipation.

UNIT II **9 Hrs.**

Stick diagram, Layout diagrams, Combinational logic design examples, Complementary logic, Pseudo NMOS logic, Pass Transistor Logic, Complementary Pass Transistor logic, Double Pass Transistor logic, Dynamic Logic and Domino logic.

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			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
MTES101	DCC	Digital VLSI Design	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT III **8 Hrs.**

Array Subsystems: SRAM, DRAM, ROM, Serial Address memories, Content addressable memories, Programmable logic arrays. Packaging, Cooling, Power distribution and Clocks.

UNIT IV **9 Hrs.**

Structured design methodology: Hierarchy, Regularity, Modularity and Locality, Design methods: Microprocessor/DSP, SOG/GA, PLD, Platform based design, SOC, Design flows, Design economics. Data path Subsystem: Addition, Subtraction, Comparators, Counters.

UNIT V **8 Hrs.**

CMOS Processing Technology, Single crystal Silicon growth, Wafer Formation, Photolithography, N-well process, Twin tub process, Stick Diagrams, layout design rules, CMOS process enhancements.

Text Books:

1. Neil H.E. Weste, David Money Harris, “CMOS VLSI Design, A circuits and systems perspective”, IV Edition, Pearson, 2010.
2. Behzad Razavi, “Design of Analog CMOS Integrated Circuits”, Tata McGraw-Hill Education, 2002.
3. Peter Van Zant, “Microchip Fabrication, A Practical Guide to Semiconductor Processing”, Sixth Edition, McGraw Hill Professional, 2013.

References:

1. Randall L. Geiger, Philip E. Allen, Noel R. Strader, “VLSI Design Techniques for analog and digital circuits”, Tata McGraw Hill, 1989.
2. Sung Mo Kang, Yusuf Lebliabici, “CMOS Digital Integrated Circuits: Analysis and Design”, IV Edition, Tata McGraw Hill, 2015.
3. Douglas A. Pucknell, Kamran Eshraghian, “Basic VLSI Design”, III Edition, Prentice Hall, 1994.
4. S M Sze, VLSI Technology, II Edition, Tata McGraw-Hill Education, 2003.
5. Sorab Gandhi: “VLSI Fabrication Principles”, Wiley India.

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GENERIC ELECTIVE IV SEMESTER

GEMPG401 Financing Startups

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
GEMPG401	GE	Financing Startups	60	20	20	-	-	3	-	-	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; **GE**- General Electives
***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

This is an invaluable road map, not just for anyone thinking about starting a new business, but also for those wanting to unravel the mysteries of entrepreneurship.
Students will be able to understand

- Startup opportunities
- Legal and other requirements for new ventures
- Financial Issues of startups
- Sustainability and growth of startups
- Exit strategies

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Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. To instill a spirit of entrepreneurship
2. To instill a spirit of entrepreneurship among the student participants.
3. To give insights into the Management of Business

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COURSE CONTENT

Unit I: Overview of Startups

1. Introduction
2. Eligibility and registrations for startups
3. Sources of Finance
4. Getting Funded – Steps in the Funding Process

Unit II: Venture Capital

1. Introduction
2. Entry terms and exit terms
3. VC Investment

Unit III: Starting up Financial Issues:

1. Feasibility Analysis – The cost and process of raising capital –
2. Unique funding issues of a high-tech ventures –
3. Funding with Equity – Financing with Debt-
4. Funding startups with bootstrapping- crowd funding- strategic alliances

Unit IV: Crowd funding

1. Overview and Evolution
2. Equity Crowed funding
3. Reward based Crowd funding
4. Other sources of finance

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GENERIC ELECTIVE IV SEMESTER

GEMPG401 Financing Startups

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Unit V: Startup Survival and Growth:

1. Stages of growth in a new venture
2. Growing with the market
3. Growing within the industry
4. Venture life patterns
5. Reasons for new venture failures

Suggested Readings

1. Kathleen R Allen.(2016). ***Launching New Ventures, an Entrepreneurial Approach,*** Cengage Learning.
2. Anjan Raichaudhuri.(2010). ***Managing New Ventures Concepts and Cases,*** Prentice Hall International.
3. S.R. Bhowmik and M. Bhowmik.(2007), ***Entrepreneurship***, New Age International.
4. Steven Fisher, Ja-nae Duane. (2016). ***The Startup Equation -A Visual Guidebook for Building Your Startup***, ***Indian Edition***, Mc Graw Hill Education India Pvt. Ltd.
5. Donald F Kuratko, Jeffrey S. Hornsby.(2017). ***New Venture Management: The Entrepreneurs Road Map,*** Routledge.
6. Vijay Sathe. (2009). ***Corporate Entrepreneurship***, Cambridge.