

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of Teaching and Examination

B.E. VII SEMESTER

ELECTRONICS AND INSTRUMENTATION

S.No.	Board of studies	Subject Code	Subject Name	Period Per Week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory / Practical				
							ESE	CT	TA		
1	Electronics & Instrumentation	327711 (27)	Industrial Electronics	4	1	-	80	20	20	120	5
2	Electronics & Instrumentation	327712 (27)	Analytical Instrumentation	3	1	-	80	20	20	120	4
3	Electronics & Instrumentation	327713 (27)	Micro controllers and Applications	3	1	-	80	20	20	120	4
4	Electronics & Instrumentation	327714 (27)	PC Based Instrumentation	3	1	-	80	20	20	120	4
5	Refer Table – II		Elective - II	3	1	-	80	20	20	120	4
6	Electronics & Instrumentation	327721 (27)	Industrial Electronics Laboratory	-	-	4	40	-	20	60	2
7	Electronics & Instrumentation	327722 (27)	Analytical Instrumentation Laboratory	-	-	4	40	-	20	60	2
8	Electronics & Instrumentation	327723 (27)	Micro controllers and Applications Laboratory	-	-	4	40	-	20	60	2
9	Electronics & Instrumentation	327724 (27)	Minor Project	-	-	4	100	-	40	140	2
10	Management	300725 (36)	Innovative & Entrepreneurial Skills	-	-	2	-	-	40	40	1
11	Electronics & Instrumentation	327726 (27)	*Practical Training evaluation & Library	-	-	1	-	-	40	40	1
Total				16	5	19	620	100	280	1000	31

L-Lecture, T- Tutorial, P- Practical, ESE- End Semester Examination, CT- Class Test, TA- Teacher's Assessment

* To be completed after VI Semester and before the commencement of VII Semester

**Table - II
Professional Elective - II**

Sl. No.	Board of Study	Code	Subject
1	Electronics & Instrumentation	327751 (27)	Digital Process Control
2	Electronics & Instrumentation	327752 (27)	Virtual Instrumentation
3	Electronics & Instrumentation	327753 (27)	Instrumentation System Reliability
4	Electronics & Instrumentation	327754 (27)	Neural Network & Fuzzy Logic Control
5	Electronics & Instrumentation	327755 (27)	Digital Image Processing
6	Electronics & Instrumentation	327756 (27)	Telematics

Note (1) - 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

Note (2) - Choice of elective course once made for an examination cannot be changed in future examinations

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII
Subject: Industrial Electronics
Total Theory Periods: 50
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: Two

Branch: E&I/AE&I
Code: 327711 (27)
Total Tutorial Periods: 12

UNIT – I : DC Amplifiers

Need for DC amplifiers, DC amplifiers—Drift, Causes, Darlington Emitter Follower, Cascode amplifier, Stabilization, Differential amplifiers—Chopper stabilization, Operational Amplifiers, Ideal specifications of Operational Amplifiers, Instrumentation Amplifiers.

UNIT – II : Regulated Power Supplies

Block diagram, Principle of voltage regulation, Series and Shunt type Linear Voltage Regulators, Protection Techniques— Short Circuit, Over voltage and Thermal Protection.

UNIT – III : Switched Mode & IC Regulators

Switched Mode voltage regulator, Comparison of Linear and Switched Mode Voltage Regulators, Servo Voltage Stabilizer, monolithic voltage regulators Fixed and Adjustable IC Voltage regulators, 3-terminal Voltage regulators— Current boosting .

UNIT – IV : Industrial Applications – I

Industrial timers -Classification, types, Electronic Timers – Classification, RC and Digital timers, Time base Generators. Electric Welding – Classification, types and methods of Resistance and ARC welding, Electronic DC Motor Control.

UNIT – V : Industrial Applications – II

High Frequency heating – principle, merits, applications, High frequency Source for Induction heating. Dielectric Heating – principle, material properties, Electrodes and their Coupling to RF generator, Thermal losses and Applications. Ultrasonic – Generation and Applications.

Text Books:

1. Industrial and Power Electronics – G.K. Mithal and Maneesha Gupta, Khanna Publishers.
2. Industrial Electronics and Power Control, H.C. Rai, Umesh Publications.

Reference Books:

1. Thyristors and applications – M. Rammurthy, East-West Press.

Chhattisgarh Swami Vivekanand Technical University, Bilai

Semester : VII

Subject: Analytical Instrumentation

Total Theory Periods: 40

Total Marks in End Semester Examination: 80

Minimum number of Class tests to be conducted: Two

Branch: E&I/AE&I

Code: 327712 (27)

Total Tutorial Periods: 12

UNIT – I : Introductions

Selection of instruments for application in industries -on line instrumentation and laboratory techniques- a brief review, introduction to the subject, difference between analytical and other instruments.

UNIT – II : Sampling Techniques.

Sampling Systems for liquids and gases for analysis purposes, components, automatic sampling, maintenance.

UNIT – III : Gas Analysis

Gas analysis by chemical absorption, Orsat apparatus, carbon dioxide & monoxide and hydrogen measurements, Mathanometer, Gravimetric method of gas analysis.

UNIT – IV : Humidity and Moisture Measurement

Measurement of humidity, definition of wet and dry basis moisture content, laboratory methods and online measurement techniques, electrical methods, radioscopy technique, IR Techniques, moisture in gases.

UNIT – V : Spectrochemical Analysis

Classification of techniques, Mass spectrometry, Principle Components, Applications to analysis of solids, Liquids and gases, Emission spectrometry components, spectrograph, Applications, Absorption Spectrometry, Electromagnetic radiation spectrum, Schemes for UV, IR and near IR analyzers, Comparison of the methods, Examples of Absorption patterns.

Text Books:

1. Khandpur R.S., Hand book of Analytical Instrumentation, TMH

Reference Books:

1. Patranabis, D., Principles of Industrial Instrumentation, TMs Publication, New Delhi.
2. Jones, E.B., Instrument Technology Vol.II, Analytical Instruments, Butterworths Scientific Publication, London.
3. O Riggins,P.T., Basic Instrumentation in Industrial Measurement, Mc-Graw Hill Book Co.
4. Holman, J.P. Experimental Methods of Engineers, Mc-Graw Hill Book Co., Int. Student edition.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII

Subject: Microcontrollers and Applications

Total Theory Periods: 40

Total Marks in End Semester Examination: 80

Minimum number of Class tests to be conducted: Two

Branch: E&I

Code: 327713 (27)

Total Tutorial Periods: 12

UNIT – I : OVERVIEW OF ARCHITECTURE AND MICROCONTROLLER RESOURCES

Architecture of a microcontroller – Microcontroller resources – Resources in advanced and next generation microcontrollers – 8051 microcontroller – Internal and External memories – Counters and Timers – Synchronous serial-cum-asynchronous serial communication - Interrupts.

UNIT – II : 8051 FAMILY MICROCONTROLLERS INSTRUCTION SET

Basic assembly language programming – Data transfer instructions – Data and Bitmanipulation instructions – Arithmetic instructions – Instructions for Logical operations on the tes among the Registers, Internal RAM, and SFRs – Program flow control instructions – Interrupt control flow.

UNIT – III : REAL TIME CONTROL : INTERRUPTS

Interrupt handling structure of an MCU – Interrupt Latency and Interrupt deadline – Multiple sources of the interrupts – Non-maskable interrupt sources – Enabling or disabling of the sources – Polling to determine the interrupt source and assignment of the priorities among them – Interrupt structure in Intel 8051.

UNIT – IV : REAL TIME CONTROL : TIMERS

Programmable Timers in the MCU's – Free running counter and real time control – Interrupt interval and density constraints.

UNIT – V : SYSTEMS DESIGN : DIGITAL AND ANALOG INTERFACING METHODS

Switch, Keypad and Keyboard interfacing – LED and Array of LEDs – Keyboardcum – Display controller (8279) – Alphanumeric Devices – Display Systems and its interfaces – Printer interfaces – Programmable instruments interface using IEEE 488 Bus – Interfacing with the Flash Memory – Interfaces – Interfacing to High Power Devices – Analog input interfacing – Analog output interfacing – Optical motor shaft encoders – Industrial control – Industrial process control system – Prototype MCU based Measuring instruments – Robotics and Embedded control – Digital Signal Processing and Digital Filters.

Text Books:

1. Microcontrollers Architecture, Programming, Interfacing and System Design – Raj Kamal, Pearson Education, 2005.
2. The 8051 Microcontroller and Embedded Systems – Mazidi and Mazidi, PHI,2000.

Reference Books:

1. Microcontrollers (Theory & Applications) – A.V. Deshmuk, WTMH, 2005.
2. Design with PIC Microcontrollers – John B. Peatman, Pearson Education, 2005.
3. S.Yeralan and A.Ahluwalia, 'Programming and Interfacing the 8051 Microcontroller', Addison Wesley, 1995
4. Myke Predko, Programming and Customizing the 8051 micro-controller, Tata McGraw-Hill, New Delhi
5. Kenneth J.Ayala, The 8051 Micro-controller Architecture, programming and applications, Penram International Publishers, Mumbai, 1996

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Semester : VII

Subject: PC Based Instrumentation

Total Theory Periods: 40

Total Marks in End Semester Examination: 80

Minimum number of Class tests to be conducted: Two

Branch: E&I

Code: 327714 (27)

Total Tutorial Periods: 12

UNIT –I : Introduction to Computers

Personal Computer, Operating System, I/O Ports, Plug-in-slots, PCI bus, Operators Interface. Computer Interfacing for Data Acquisition and Control – Interfacing Input Signals, Output system with continuous actuators.

Unit – II: Data Acquisition and Control using Standard Cards

PC expansion systems, Plug-in Data Acquisition Boards; Transducer to Control room, Backplane bus – VXI

Unit – III: PC Programming

Considerations Using the command line interface; Assembly language programming; C and C++ programming; Data transfer; Scaling and linearization.

UNIT – IV : Computers in Process Control

Digital control (DDC). Supervisory digital control (SCADA). Characteristics of digital data. Controller software. Linearization. Digital Controller modes, error, proportional, derivative and composite controller modes.

UNIT – V : Data Acquisition Basics

ADC, DAC, DIO, counters & timers, PC Hardware structure, timing, interrupts, DMA, software and hardware installation.

Text Books:

1. John. W .Webb Ronald A Reis , Programmable Logic Controllers – Principles and Applications, Fourth edition, Prentice Hall Inc., New Jersey, 1998.
2. Computer Control of Processes – M.Chidambaram. Narosa 2003

Reference Books:

1. PC Based Instrumentation and Control Third Edition by Mike Tooley ; Elsevier
2. PC Interfacing and Data Acquisition Techniques for Measurement, Instrumentation and Control. By Kevin James; Elsevier
3. Practical Data Acquisition for Instrumentation and Control Systems by John Park and Steve Mackay
4. Distributed Control Systems, Lukcas M.P, Van Nostrand Reinhold Co., New York, 1986.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII

Subject: Digital Process Control

Total Theory Periods: 40

Total Marks in End Semester Examination: 80

Minimum number of Class tests to be conducted: Two

Branch: E&I

Code: 327751 (27)

Total Tutorial Periods: 12

Unit – I : Sampling Theorem and Converters

Review of Sample theory - Shannon's sampling theorems - Sampled Data Control system, Digital to Analog conversion – Analog to Digital conversion, Ramp type A/D, Dual slope A/D, Successive approximation A/D. - A/D & D/A converters - Review of Z and Inverse Z transform - Reconstruction - Zero Order Hold.

Unit – II : System Response

Response of sampled data systems to step and ramp inputs - Steady state errors - Z domain equivalent - Stability studies - Bilinear transformation - Jury's stability test.

Unit – III : Function Realisation

State sequences for sampled data systems - solutions - Pulse transformation function by direct, cascade and parallel realization - Sampled data model for continuous system - Controllability and observability.

Unit – IV : Digital Process Control Design

Digital PID algorithm - Positional and incremental forms - Dead-beat algorithm-Ringing - Dahlin's and Kalman's algorithms - Implementation of control algorithms using microprocessors - General description of microcontrollers - Digital quantization.

Unit – V : Applications

System models, control algorithms and their implementation for micro processor based position and temperature control systems - Operational features of stepper motors - Drive circuits - Interfacing of stepper motor to microprocessors.

Text Book

1. Gopal.M: "Digital Control Engineering", Wiley Eastern Publications.

Reference Books:

1. Ahson, S.I., : " Microprocessors with Applications in Process Control" , TMH.
2. Nagrath, J.J, and Gopal, M, " Control System Engineering" , Wiley & Sons.
3. Constantine Houpis, and Garry Lamont., "Discrete Control systems" - Theory, Hardware and Software, McGraw Hill.

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Semester : VII

Subject: Virtual Instrumentation

Total Theory Periods: 40

Total Marks in End Semester Examination: 80

Minimum number of Class tests to be conducted: Two

Branch: E&I/AE&I

Code: 327752 (27)

Total Tutorial Periods: 12

UNIT – I : Review of Virtual Instrumentation

Historical perspective, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow, comparison with Conventional programming.

UNIT – II : VI Programming Techniques

VIS and sub-VIS, loops and charts, arrays, clusters and graphs, case and sequence structures, formula nodes, local and global variables, string and file I/O

UNIT –III : Data Acquisition Basics

ADC, DAC, DIO, counters & timers, PC Hardware structure, timing, interrupts, DMA, software and hardware installation.

UNIT –IV : Common Instrument Interfaces

Current loop, RS 232C/ RS485, GPIB, System buses, interface buses: USB, PCMCIA, VXI, SCXI, PXI, etc., networking basics for office & Industrial applications, VISA and IVI, image acquisition and processing. Motion control.

UNIT – V : Use of Analysis Tools

Fourier transforms, power spectrum, correlation methods, windowing & filtering. VI applications in various fields.

Textbooks

1. Gary Johnson, Labview Graphical Programming , Second edition, McGraw Hill.
2. Lisa K. wells & Jeffrey Travis, Labview for everyone, Prentice Hall.

References

1. Sokoloff, Basic concepts of Labview 4, Prentice Hall.

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Semester : VII
Subject: Instrumentation System Reliability
Total Theory Periods: 40
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: Two

Branch: E&I/AE&I
Code: 327753 (27)
Total Tutorial Periods: 12

UNIT – I : Reliability Concepts

Introduction, reliability, importance of reliability in system instrumentation, failures and failure mode, cause of failures, instantaneous failure rate, general reliability function.

UNIT – II : Component Reliability & Hazard Model

Component reliability from test data, failure data (Failure density, failure rate reliability, probability of failure), mean failure rate, mean time to failure, mean time between failure, MTTF in terms of failure density, hazard models, linear hazard model, non linear hazard model.

UNIT – III : System reliability

Logic diagram of system instrumentation, series configuration, parallel configuration, stand by configuration, Kout of configuration, complex system, markov method, fault tree technique, event space method, tie set method.

UNIT – IV : Reliability Improvement

Introduction, Component versus unit redundancy, weakest link technique, mixed redundancy, stand by redundancy.

UNIT – V : Maintainability & Availability

Introduction, Maintainability function, Availability function, frequency of failure two unit parallel system with repair allocation of redundancy failure rate, time of continuous operation, mean repair time.

Names of Text Books:

1. An Introduction to Reliability and Maintainability Engineering - *Ebeling*; Tata McGraw Hill
2. Probabilistic Reliability - An Engineering Approach, *M.L. Shooman*, McGraw-Hill Publ

Name of Reference Books:

1. Fault-Diagnosis Systems: An Introduction from Fault Detection to Fault Tolerance, *Rolf Isermann*
2. Engineering Design Reliability Handbook, *Boca Raton*; CRC Press

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Semester : VII
Subject: **Neural Network & Fuzzy Logic Control**
Total Theory Periods: **40**
Total Marks in End Semester Examination: **80**
Minimum number of Class tests to be conducted: **Two**

Branch: **E&I/AE&I**
Code: **327754 (27)**
Total Tutorial Periods: **12**

UNIT – I : Introduction to Neural Networks

Different architectures of neural networks, Rosenblott's perceptrons, multi layer perceptrons, back propagation algorithm, Hopfield's networks, Kohonen's self organizing maps, adaptive resonance theory.

UNIT – II : Neural Networks for Control Systems

Schemes of neuro-control, identification and control of dynamical systems , case studies(Inverted Pendulum, Articulation Control)

UNIT – III : Introduction to Fuzzy Logic

Fuzzy sets, fuzzy relations, fuzzy conditional statements, fuzzy rules, fuzzy learning algorithms.

UNIT – IV : Fuzzy Logic for Control Systems

Fuzzy logic controllers, fuzzification interface, knowledge/rule base, decision making logic, defuzzification interface, design of fuzzy logic controllers, case studies(Inverted Pendulum, Articulation Control)

UNIT – V : Neuro-fuzzy and Fuzzy-neural Control Systems

Adaptive fuzzy systems , optimizing the membership functions and the rule base of fuzzy logic controllers using neural networks, fuzzy transfer functions in neural networks.

Text Books:

1. Kosko, B, Neural Networks and Fuzzy Systems : A Dynamical Approach to Machine Intelligence, Prentice Hall, New Delhi.
2. Wasserman P.D, Neural Computing Theory & Practice ,Van North-Hland.

Reference Books:

1. Jacek M. Zurada, 'Introduction to Artificial Neural Systems', Jaico Publication House.
2. J.Ross,Fuzzy Logic with Engineering Applications, Prentice Hall International.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII

Subject: Digital Image Processing

Total Theory Periods: 40

Total Marks in End Semester Examination: 80

Minimum number of Class tests to be conducted: 2

Branch: E&I/AE&I

Code: 327755 (27)

Total Tutorial Periods: 12

UNIT – I

Introduction: Digital Image representation, Elements of Digital Image Processing Systems. Elements Of Visual perception structure of human eye, simple image model, sampling and quantization, basic relationship between pixels, imaging geometry, photographic film.

UNIT – II

Statistical properties: Histogram mean, standard deviation, profile different distributions. **Image Transform:** One and two dimensional DFT the discrete cosine transform, Hadamand transform, haar transform, slant transform.

UNIT – III

Image Enhancement: Spatial and frequency Domain methods point operations, contrast stretching, bit extraction, range compression, Histogram equalization, modification local enhancement, image smoothing spatial operations, filtering multispectral, color image processing, Pseudo- color image enhancement.

UNIT – IV

Image restoration: degradation model, Restoration in spatial domain geometric transformation spatial transformation, approach to restoration, Inverse & Wiener filtering, **image compression:** basics of image compression, models, elements of information theory, error free compression, lossy compression, image segmentation, line detection, edge detection, edge linking and boundary detection, thresholding & region oriented segmentation.

UNIT – V

Image Analysis: boundary extraction, boundary representation, region representation structure shape features, texture, scene matching and detection. **Applications of image processing:** Character recognition, diagram understanding, medical imaging, scientific analysis, military guidance and reconnaissance remote sensing, telecommunication.

Name of Text Books:

1. Digital Image Processing - Gonzawlez & Woods, Addison Wesley.
2. Digital Image Processing, Madhuri A. Joshi, PHI

Name of Reference Books:

1. Digital Image Processing - Pratt, Wiley International.
2. Digital Image Processing – Said Ahmed, TMH.
3. Digital Image Processing & Analysis – B. Chanda & D. Dutta Majumdar. PHI

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII
Subject: Telematics
Total Theory Periods: 40
Total Marks in End Semester Examination: 80
Minimum number of Class tests to be conducted: Two

Branch: E&I
Code: 327756 (27)
Total Tutorial Periods: 12

UNIT – I : Digital Telephony

Principle of working of SPC digital telephone exchanges. Digital switching, space, time, TS, ST, STS, TST switch blocks, Synchronization aspect for digital telephony.

UNIT – II : Radio Communication Systems

Various types of AM and FM transmitters, Various types of AM and FM communication receivers. Receiver testing.

UNIT – III : Satellite Communications:

Basic considerations. Up-link and down link parameters. Orbit and frequency selection. Elements of multiple access techniques. Functional description of earth stations.

UNIT – IV : System Performance Communication

Noise-performance of analog CW and pulse modulation systems using coherent and non-coherent detection. Baseband PCM and delta modulation systems performance in terms of probability of error and S/N ratio. Matched filter. Probability of error performance of band pass. ASK,FSK,BPSK,QPSK and simple QAM systems.

UNIT – V : Mobile Communication

Essential aspects of working, of radio paging, cellular radio telephone and cordless telephone.

Text Books:

1. Electronic communication by -D Roody and J.Coolen, PHI, India.
2. Telecommunication and computers by -J. Mortin, PHI, India.

Reference Books:

1. Principles of Communication systems by-H Taub and D.L. Schilling Mc-Gaw Hill, Kogakusha.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII

Subject: Industrial Electronics Laboratory

Total Practical Periods: 50

Total Marks in End Semester Examination: 40

Branch: E&I / AE&I

Code: 327721 (27)

Experiments to be performed:

1. SCR characteristics.
2. TRIAC characteristics.
3. DIAC characteristics
4. UJT characteristics.
5. Power control using SCR.
6. Power control using TRIAC.
7. Commutation of SCR class A,B,C.
8. Single phase half controlled rectifier.
9. Single phase full controlled rectifier.
10. Buck, boost and buck-boost regulators.
11. single phase PWM inverter.
12. Study and obtain the waveforms for single-phase fully controlled bridge converter.
13. Perform experiment on triggering circuits for SCR.
 - R-triggering circuit.
 - R-C triggering circuit.
 - UJT triggering circuit.

List of Equipments

Discrete Components, AC and DC Voltage Sources, Voltmeter, Ammeter, CRO, Function Generator, Trainer Kits

Reference Book:

1. Industrial Electronics and Power Control, H.C. Rai, Umesh Publications.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII
Subject: Analytical Instrumentation Laboratory
Total Practical Periods: 50
Total Marks in End Semester Examination: 40

Branch: E&I / AE&I
Code: 327722 (27)

Experiments to be performed:

1. To measure pH value of given solution pH meter.
2. To determine suspended particular matter using right volume air samples.
3. Find out concentration of (Na or K) by flame photo meter in the given sample.
4. To measure transmittance and absorption of a solution using Single beam spectro photo meter.
5. To study water analysis kit & measure pH, temperature, conductivity, dissolved O₂ of a given solution.
6. To measure the conductivity of solution indicator controller.
7. To study the analysis of flue gases.
8. To study ion selective electrode.
9. To study pH monitor and controller.
10. Study of silica analyzer and zirconia based oxygen analyzer.
11. Study calibration technique of analysis.
12. Study gas/liquid chromatograph.

List of equipments:

pH Meter, Flame photometer, Spectrophotometer, Conductivity meter, Oxygen Analyzer, Chromatograph, Mathanometer and related instruments and chemicals.

Reference Book:

1. Khandpur R.S., Hand book of Analytical Instrumentation, TMH

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester : VII

Subject: Microcontrollers and Applications Laboratory

Total Practical Periods: 50

Total Marks in End Semester Examination: 40

Branch: E&I

Code: 327723 (27)

Experiments to be performed:

1. Write a microcontroller 8051 program to transfer the bytes into RAM locations starting at 50H, assuming that ROM space starting at 240H contains CHHATTISGARH by using – a) a Counter, b) null char for end of string .
2. Write a microcontroller 8051 program to get hex data on the range of 00-FFh from port 0 and convert it to decimal. Save the digits in R7, R6 and R5, where the least significant digit is in R7.
3. Write a microcontroller 8051 program to add two 16 Bit unsigned numbers. Operands are two RAM variables. Results to be in R1-R0 pair.
4. Write a microcontroller 8051 program to subtract an unsigned 16 Bit number from another. Operands are two RAM variables. Results to be in R1-R0 pair.
5. Write a microcontroller 8051 program to add two unsigned 32-bit numbers. Operands are two RAM variables. Results to be in R1-R0 pair.
6. Write a microcontroller 8051 program to add two 16 Bit signed numbers.
7. Write a microcontroller 8051 program to convert a binary number to equivalent BCD
8. Write a microcontroller 8051 program to convert a packed BCD number to two ASCII numbers and place them in R5 and R6.
9. Write a microcontroller 8051 program to calculate the square root of an 8-bit number using iterative method.
10. Write a microcontroller 8051 program to add two floating-point numbers.
11. Write a microcontroller 8051 program to multiply two floating-point numbers.
12. Write a microcontroller 8051 program that generates 2kHz square wave on pin P1.0, 2.5 kHz on pin P1.2 and 25 Hz on pin P1.3.
13. Write a microcontroller 8051 program for counter 1 in mode 2 to count the pulses and display the state of the TL1 count on P2. Assume that the clock pulses are fed to pin T1.
14. Write a microcontroller 8051 program to transfer letter "N" serially at 9600 baud, continuously. Assume crystal frequency to be 11.0592 MHz.
15. Write a microcontroller 8051 program to transfer word "CSV TU" serially at 4800 baud and one stop bit, continuously. Assume crystal frequency to be 11.0592 MHz.
16. Write a microcontroller 8051 program to receive bytes of data serially, and put them in P1. Set the baud rate at 2400 baud, 8-bit data, and 1 stop bit. Assume crystal frequency to be 11.0592 MHz.

List of Equipments/Machine Required:

Microcontroller kit, Interfacing kit, Keyboard, Monitor, SMPS for Microcontroller

Recommended Books:

Kenneth J. Ayala, The 8051 Micro-controller Architecture, programming and applications, Penram International Publishers, Mumbai, 1996

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

BHILAI (C.G.)

Semester: VII
Subject: Innovative and Entrepreneurial skills
Total Theory Periods: 28
Total Marks in End Semester Exam: 40
Minimum no. Of Class test to be conducted:- 02

Branch: Management
Code: 300725 (36)
Total Tutorial Period: NIL

Unit I

Innovation: innovation- an abstract concept; creativity, innovation and imagination; types of innovation - classified according to products, processes or business organizations.

Unit II

Entrepreneurship: who is an entrepreneur? Entrepreneurship- A state of Mind, Emergence of entrepreneur; Role of Entrepreneur; A Doer not a Dreamer- Characteristics of an entrepreneur; Factors affecting entrepreneurial growth – Social, cultural, personality factors, psychological and Social Factors. Impact of Entrepreneurship for sustainable development.

Unit III

Difference between entrepreneur and entrepreneurship, Difference between entrepreneur and intra-preneur, Common Entrepreneurial competencies/Traits; Entrepreneurship stimulants, Obstacles inhibiting Entrepreneurship; Types of entrepreneurs, Functions of an entrepreneur.

Unit IV

Identification of Business Opportunities: Introduction, Sources of Business of Product Ideas, Steps in Identification of Business opportunity and its SWOT Analysis.

UNIT-V

Techno-Economic Feasibility of the project: Introduction, Techno- Economic feasibility of the Project, Feasibility Report, Considerations while preparing a Feasibility Report, Proforma of Feasibility Report, Role of Institutions and entrepreneurship.

Text and Reference Books:

1. Competing through Innovation-Bellon & Whittington, Prentice Hall of India
2. A Guide to Entrepreneurship – David Oates- JAICO Publishing House.
3. Entrepreneurship- Rober D Hisrich, Peters, Shepherd- TMH
4. Entrepreneurship in Action- Coulter, Prentice Hall of India
5. Entrepreneurship Management and Development – Ajith Kumar, HPH
6. Fundamentals of entrepreneurship- Mohanty, PHI
7. Patterns of Entrepreneurship- Jack M Kaplan, Wiley, student Edition.