# KAKATIYA UNIVERSITY
## U.G. B.Sc. Final Year (Under CBCS)
## Semester – VI: Generic Elective Paper-II
## (FOR ALL SCIENCE FACULTY DEPARTMENTS)

### WATER RESOURCES MANAGEMENT

**UNIT-I**

1. Importance of Natural Resources – Different Types Resources
2. Significance of Water Resources and their uses
3. Conservation of water and recycling of the water – Global distribution of water
4. Water shed programmes and their management
5. Storing the rain water in tanks and recharging ground water.

**Unit-II**

6. Rain water harvesting in rural areas (chekdam, trenches etc.,)
7. Over use of surface and ground water and control measures.
8. Aims, objectives and implementation of Mission Bhagiratha (Telangana Government Drinking water programme )
9. Aims, objectives and implementation of Mission Kakatiya (Telangana Government minor irrigation programme)
10. Issues and challenges in Water Resources Management

Dr. B. Venkatram Reddy
Chairman, Board of Studies in Physics, KU, Wgl
Date: 24th Aug., 2016 & 5th June, 2017

**B.Sc. (ELECTRONICS) – III year**
**Semester - VI**
**Paper – VII:: 8085 Microprocessor and Applications**
**(DSC – Compulsory)**
**(w.e.f the academic year 2018-19)**

**Total number of hours: 42**
**No of hours per week: 3**

**UNIT-I (11 Hrs)**
**Introduction to 8085 Microprocessor & its architecture::** Introduction to Microcomputer, Intel 8085 Microprocessor – Architecture of 8085 microprocessor – CPU – Timing & Control Unit – Instruction cycle, Fetch Cycle , Execute cycle (Timing diagram), Machine cycle and clock states. Interrupts – Hardware and Software. Address space partitioning – Memory mapped I/O & I/O mapped I/O.

**UNIT-II (10 Hrs)**
**Instruction set of 8085 microprocessor:** Classification - Data transfer operations, Arithmetic operations, logical operations, Branch control operations and stack, I/O and Machine control operations. Stack and Subroutines, Addressing modes.

**UNIT-III (10 Hrs)**
**Programming of 8085 microprocessor:** Assembly language programming, addition (8 and 16 bit ), 8 bit - subtraction, multiplication and division. Finding the largest and smallest number in data array. Program to arrange the given numbers in ascending and descending order. Counters and Time delays.

**UNIT-IV (11 Hrs)**
**Interfacing of peripherals:** Types of programmable and non programmable interfacing peripherals- 8212 (I/O port) – programmable peripheral interface 8255.
D/A Converters: (Binary weighted, R-2R ladder network), A/D Converters (Dual slope, Successive approximation), Closed loop and open loop process control systems (concept only), Stepper motor control.

**Books Recommended**:

1) Microprocessor Architecture and Programming – Ramesh S.Goanker – Penram.
2) Fundamentals of Microprocessors and Micro controllers – B.Ram, - Dhanpat rai & sons.
3) Text book of Electronics B.SC III year (Vol.III)-Telugu Academy.
4) Introduction to Microprocessor – Aditya P.Mathur – TMH.
5) Microprocessor Lab Premier – K.A. Krishnamurthy.

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**B.Sc. (Electronics Practical's) – III year**
**Semester - V**
**Paper – VII: 8085 Microprocessor and Applications Lab**

## I. 8085 – Software Experiments :

1. Binary addition (8 bit and 16 bit )and subtraction ( 8 bit ).
2. Decimal Addition ( DAA).
3. Multiplication and Division ( 8 bit ).
4. Picking of largest/Smallest number from the given data.
5. Arranging the given data in ascending/descending order.
6. Time Delay generation.

## II. 8085 - Hardware Experiments:

**1.** R – 2R ladder network (DAC ) ( 4 bits ).
**2.** Interfacing a Stepper motor and rotating it clockwise/anticlockwise direction through a known angle.
**3.** Interfacing a seven segment display.
**4.** Interfacing ADC for temperature measurement.

**Note: Student has to perform minimum of eight experiments**

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**B.Sc. (ELECTRONICS) – III year**
**Semester - VI**
**Paper – VIII (A): 8051 Microcontroller and Applications**
**(DSE – Elective-2)**
**(w.e.f the academic year 2018-19)**

**Total number of hours: 42**
**No of hours per week: 3**

**UNIT-I (11 Hrs)**
**The Microcontroller 8051:** Overview and block diagram of 8051. Architecture and pin diagram of 8051. Data types and directives, Memory organization, register banks and Stack Pointer. PSW Register, other special function registers, I/O port organization. Interrupts and Timer/Counter modules.

**UNIT-II (10 Hrs)**
**Instruction set of 8051 microcontroller:** Classification- Data transfer, Arithmetic, logical, Single Bit, Jump, Loop and CALL instructions and their usage. Addressing modes - Immediate, Register, Direct, Indirect, Absolute addressing, Relative addressing, Indexed Addressing and accessing memory using various addressing modes.

**UNIT-III (11 Hrs)**
**Programming examples of microcontroller 8051:**
Addition, Subtraction, division, picking the smallest/largest number among a given set of numbers, arranging a given a set of numbers in ascending/descending order, subroutines, I/O Programming, Bit manipulation. Accessing a specified port terminal and generating wave forms.
**Timer/Counter Programming in 8051:** Programming 8051 timers- basic registers of timers- Timer 0, Timer 1 registers. TMOD register, TCON register. Timer modes - Mode1, Mode2 programming. Counter mode programming. Program to generate time delay.

**Unit – IV (10 Hrs)**
**Serial communications:** Serial communication, Types, modes and protocols, Data transfer rates, serial communication program- SBUF and SCON registers, RS232 standards,Programming timer Interrupts,
**Applications of Micro controller:** Displaying information on a LCD, Interfacing a keyboard, Interfacing a temperature sensor,Interfacing of DAC 0808 to microcontroller, Interfacing of ADC 0804 to microcontroller,Seven segment LED.

**Books Recommended**:

1) The 8051 Microcontrollers and Embedded Systems – Muhammad AliMazidi and Janice gillipsieMazidi – Pearson Education Asia, 4th Reprint, 2002.
2) Text book of ElectonicsBsc III year (vol.III)-Telugu Akademi.
3) Fundamentals of Microprocessors and Microcontrollers – B.Ram.
4) The 8051 Microcontroller – architecture, programming and applications KennthJ.Ayala-Penram International Publishing, 1995.
5) Micro controllers-Theory and Applications-Ajay V.Deshmukh.

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**B.Sc. (Electronics Practicals) – III year**
**Semester -VI**
**Paper – VIII (A) :: 8051 Microcontroller and Applications Lab**

**Experiments using 8051 microcontroller:**

1. Multiplication of two numbers using MUL command ( later using counter method for repeated addition).
2. Division of two numbers using DIV command ( later using counter method for repeated subtraction).
3. Pick out the largest/smallest number among a given set of numbers.
4. Arrange the given numbers in ascending/descending order.
5. Generate a specific time delay using timer/counter.
6. Interface ADC and a temperature sensor to measure temperature.
7. Interface DAC and generate a staircase wave form with a step duration and number of steps as variables.
8. Flash a LED connected at a specified out port terminal.
9. Interface stepper motor to rotate clock wise / anti clock wise through a given angle steps.

**Experiments with Keil Software:**

1. Write a program to pick out largest/smallest number among a given set of number.
2. Write a program to arrange a given set of numbers in ascending/descending order.
3. Write a program to generate a rectangular/square wave form at specified port.
4. Write a program to generate a time delay using timer registers.

**Note: Student has to perform minimum of eight experiments**

**B.Sc. (ELECTRONICS) – III year**
**Semester - VI**
**Paper – VIII (B) :: Optical Fiber Communication**
**(DSE – Elective-2)**
**(w.e.f the academic year 2018-19)**

**Total number of hours: 42**
**No of hours per week: 3**

**Unit 1: (11 Hrs)**
Introduction: Historical developments, optical fiber communication system, advantages of optical fiber communication, total internal reflection, acceptance angle, numerical aperture, skew rays, cylindrical fiber, single mode fibers. Transmission characteristics of optical fibers: Attenuation, material absorption losses in silicon glass fibers, linear scattering losses, non linear scattering losses, fiber bend loss.

**Unit 2: (11 Hrs)**
Transmission characteristics of optical fibers (B): mid-infrared and far-infrared transmission, intermodal and intra-modal dispersion, overall fiber dispersion, polarization. Optical fibers and cables: preparation of optical fibers, liquid phase (melting) techniques, vapor phase deposition techniques, fluoride glass fibers, optical fibers.

**Unit 3: (10 Hrs)**
Optical fiber connection: joints and couplers, fiber alignment and joint loss, splices, connectors, couplers. Optical sources and detectors: Absorption and emission of radiation, Einstein's relation, population inversion, optical emission from semiconductors, semiconductor injection laser, LED power and efficiency characteristics.

**Unit 4: (10 Hrs)**
Optical detection principles, absorption, quantum efficiency, responsivity, long wavelength cutoff, p-n photodiode, p-i-n diode, photo transistors.
Optical fiber measurements: Fiber attenuation measurements, dispersion measurements, refractive index profile measurements, cut-off wavelength measurements, numerical aperture measurements.

**Reference books:**
1. Optical fiber communications, Principles and Practice, John M. Senior, PHI.
2. Optical fiber systems: Technology, design and applications, Charles K Kao, McGraw Hill International Edition.
3.Optical fiber communications, Gerd Keiser, Mc-GrawHill International Edition.
4.Optical fiber communication, J. Gower, PHI.

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**B.Sc. (Electronics Practical's) – III year**
**Semester - VI**
**Paper – VIII (B) :: Optical Fiber Communication Lab**

**I. Fiber Optic Analog Link (using both 660nm and 850nm)**

1. Losses in Optical Fibers.
2. Characteristics of Electrical to Optical Converters.
3. Characteristics of Optical to Electrical converters.
4. Measurement of Numerical Aperture (NA)
5. Intensity Modulation.

**II. Fiber Optic Digital Link (Using both 660nm and 850nm)**

1. Study of Fiber optic analog Link.
2. Estimation of rise time and fall time distortions.
3. Estimation of propagation delay.
4. Encoding methods for fiber optic digital transmission.

**Note: Student has to perform minimum of eight experiments.**

# B.Sc -Faculty of Sciences
# CBCS Pattern in Semester System (*with effect from 2016-17*)

**B.Sc. ELECTRONICS SYLLABUS**
**B.Sc. III YEAR, Semester - VI**
**Paper – VIII - C (Elective)**
**DSE: Digital System Design Using VHDL**

**Total number of hours: 42**
**No. of credits: 3**

**UNIT – I**

**Fundamental Concepts**: Modeling Digital Systems, Domains and Levels of Modeling, Modeling Languages, VHDL Modeling Concepts, Learning a New Language: Lexical Elements and Syntax.
**Scalar Data Types and Operations**: Constants and Variables, Scalar Types, Type Classification, Attributes of Scalar Types, Expressions and Operators.
**Sequential Statements**: If Statements, Case Statements, Null Statements, Loop Statements, Assertion and Report Statements.

**UNIT – II**

Composite Data Types and Operations: Arrays, Unconstrained Array Types, Array Operations and Referencing, Records.
**Basic Modeling Constructs**: Entity Declarations, Architecture Bodies, Behavioral Descriptions, Structural Descriptions, Design Processing.
**Subprograms:** Procedures, Procedure Parameters, Concurrent Procedure Call Statements, Functions, Overloading, Visibility of Declarations.

**UNIT – III**

**Packages and Use Clauses**: Package Declarations, Package Bodies, Use Clauses, The Predefined Package Standard.
**Resolved Signals:** Basic Resolved Signals, IEEE Std_Logic_1164 Resolved Subtypes, Resolved Signals and Ports, Resolved Signal Parameters

**UNIT – IV**

**Generic Constants**: Parameterizing Behavior, Parameterizing Structure.
**Case Study: A Pipelined Multiplier Accumulator**: Algorithm Outline, A Behavioral Model, A Register-Transfer-Level Model.
**Recommended Books:**

1. The Designer's Guide to VHDL -By Peter J.Ashenden, 2nd Ed., 1stIndian Reprint, Harcourt India Pvt. Ltd., 2001.
2. VHDL Programming by Example – By Douglas L.Perry., 4th Ed., TMH., 2002
3. Introductory VHDL : From Simulation to Synthesis –By SudhakarYalamanchili., Pearson Education Asia., 2001
4. A VHDL Primer - By J.Bhasker ., Pearson Education Asia, 11th Indian Reprint, 2004
5. Fundamentals of Digital Logic with VHDL Design - By Stephen Brown & ZvonkoVranesic., TMH. 2002
6. Digital Systems Design using VHDL by Charles H.Roth Jr., PWS Pub.,1998
7. VHDL – Analysis & Modeling of Digital Systems – By ZainalabedinNavabi., 2nd Ed., MH., 1998

**B.Sc. ELECTRONICS SYLLABUS**
**B.Sc. III YEAR, Semester – VI**
**DSE: Paper- VIII - C Practical (Elective)**
**VHDL - LAB**

**Number of hour per week: 3**

**VHDL – Program entry, simulation and Implementation (CPLD/FPGA) using appropriate HDL Software for the following circuits.**

1. All types of logic gates (Data flow).
2. Half Adder (Data Flow, Structural and Schematic).
3. Full Adder (Data Flow, structural and Schematic).
4. Half Subtractor (Data Flow, Structural and Schematic).
5. Full Subtractor (Data Flow, Structural and Schematic).
6. Two control input Mux. Using case.
7. Two control input Mux. Using conditional signal assignment.
8. Two control input Mux. Using selected signal assignment.
9. Two control input Demux. Using case.
10. BCD to seven segment decoder.
11. Modeling a RSFF with assertion, report and different levels of severity (Behavioral).
12. Modeling a BCD counter ( Top level behavioral )
13. Writing a test bench for a half adder.
14. Writing a test bench for a Full adder.

**Note: Student has to perform minimum of Six experiments**

# B.Sc -Faculty of Sciences
# CBCS Pattern in Semester System (*with effect from 2016-17*)

## Skill Enhancement Course - IV B.Sc., III YEAR, VI Semester

## QUANTITATIVE APTITUDE TEST

**Credits: 2**

**Theory: 2 hours/week** **Marks - 40**

**Unit – I ARITHMETICAL ABILITY**

**1.1 Arithmetical Ability**: Ratio & Proportion

**1.2 Arithmetical Ability**: Time & Work, Time & Distance

**1.3 Arithmetical Ability**: Simple Interest, Compound Interest

**1.4 Arithmetical Ability**: Stocks & Shares

**Unit – II DATA INTERPRETATION**

**2.1 Data Interpretation**: Tabulation

2.2 **Data Interpretation**: Bar Graphs

2.3 **Data Interpretation**: Pie Charts

2.4 **Data Interpretation**: Line Graphs

**Text Book:** Quantitative Aptitude by Dr.R.S.Aggarwa