GOUTHAMI INSTITUTE OF TECHNOLOGY AND MANAGEMENT FOR WOMEN

(Approved by AICTE, New Delhi, SBTET & Affiliated to JNTUA, Anantapuramu)

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Date : 07/06/2024.

Action Taken by the Affiliating University on the Feedback

In the view of collected feedback on curriculum from various stake holders (like Teachers, Students, Employers and Alumni) the JNT University, Anantapuramu has taken necessary action to improve the curriculum from all the aspects to meet the Industrial Requirements.

JNTUA presented courses in the curriculum based on the inputs of the stakeholders for a the affiliated colleges so it can help the students to build their carrier.

The University (JNTUA) would like to accept our kind notice to include the new subjects in curriculum of next academic year based on the feasibility.

M. Suresh

Principal

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTAPUR – 515 002 (A.P) INDIA

B.TECH. - ELECTRONICS & COMMUNICATION ENGINEERING
Course Structure (R20) – III & IV Year

Semester–V						
S.No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
1.	20A04501	Control Systems Engineering	3	0	0	3
2.	20A04502T	Digital Signal Processing	3	0	0	3
3.	20A04503T	Microprocessors and Microcontrollers	3	0	0	3
4.	20A05602T 20A04504a 20A04504b	**Professional Elective Course – I** Machine Learning Computer Architecture & Organization Information Theory and Coding	3	0	0	3
5.		**Open Elective Course – I**	3	0	0	3
6.	20A04502P	Digital Signal Processing Lab	0	0	3	1.5
7.	20A04503P	Microprocessors and Microcontrollers Lab	0	0	3	1.5
8.	20A04509	**Skill oriented course - III** PCB Design and Prototype development	1	0	2	2
9.	20A04510	Evaluation of Community Service Project				1.5
					Total	**21.5**

Open Elective Course – I

S.No	CourseCode	Course Name	Offered by the Dept.
1	20A01505	Building Technology	CE
2	20A02505	Electric Vehicles	EEE
3	20A03505	3D Printing Technology	ME
4	20A05505a	Java Programming	CSE & Allied/IT
5	20A05602T	Artificial Intelligence	
6	20A12502	Mobile Application Development using Android	
7	20A27505	Computer Applications in Food Processing	FT
8	20A54501	Optimization Techniques	Mathematics
9	20A56501	Materials Characterization Techniques	Physics
10	20A51501	Chemistry of Energy Materials	Chemistry

Note:

1. A student is permitted to register for Honours or a Minor in IV semester after the results of III Semester are declared and students may be allowed to take maximum two subjects per semester pertaining to their Minor from V Semester onwards.
2. A student shall not be permitted to take courses as Open Electives/Minor/Honours with content substantially equivalent to the courses pursued in the student's primary major.
3. A student is permitted to select a Minor program only if the institution is already offering a Major degree program in that discipline

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech (ECE)– III-I Sem

L	T	P	C
1	0	2	2

(20A04509) PCB DESIGN AND PROTOTYPE DEVELOPMENT
(Skill Oriented Course – III)

Course Objectives:

This course will teach teams of students how to design and fabricate PCB for prototyping as well as in Industrial Production environment. This will help students to innovate faster with electronics technology.

Course Outcomes:

- Understand a single layer and multilayer PCB
- Create and fabricate a PCB
- Evaluate and test a PCB

UNIT I

Fundamental of basic electronics: Component identification, Component symbols & their footprints, understand schematic, Creating new PCB, Browsing footprints libraries, Setting up the PCB layers, Design rule checking, Track width selection, Component selection, Routing and completion of the design

UNIT II

Introduction to PCB: Definition and Need/Relevance of PCB, Background and History of PCB, Types of PCB, Classes of PCB Design, Terminology in PCB Design, Different Electronic design automation (EDA)tools and comparison.

UNIT III

PCB Design Process: PCB Design Flow, Placement and routing, Steps involved in layout design, Artwork generation Methods - manual and CAD, General design factors for digital and analogue circuits, Layout and Artwork making for Single-side, double-side and Multilayer Boards, Design for manufacturability, Design-specification standards

Practice Exercises: Any twelve experiments are to be done

1. Practice following PCB Design steps
   - SchematicDesign:FamiliarizationoftheSchematicEditor,Schematiccreation,Annotation, Netlist generation.
   - LayoutDesign:FamiliarizationofFootprintEditor,Mappingofcomponents,Creationof PCB layout Schematic.
   - Create new schematic components.
   - Create new component footprints.
2. Regulator circuit using 7805
3. InvertingAmplifier or SummingAmplifier using op-amp
4. Full-wave Rectifier
5. Astable multivibrator using IC555
6. Monostable multivibrator using IC555
7. RCPhase-shiftorWein-bridgeOscillatorusingtransistor.
8. Full-Adder using half-adders.
9. 4-bit binary /MOD N counter using D-Flip flops.
10. One open-ended (analog/ digital/mixed circuit) experiments of similar nature andmagnitude to the above are to be assigned by the teacher
    (Student is expected to solve and execute/simulate independently).
11. Design an 8051 Development board havingPowersectionconsistingofIC7805,capacitor,resistor,headers,LED.
12. Design an 8051 Development board having Serial communication section consisting of MAX 232, Capacitors, DB9connector,Jumper, LEDs
13. Design an 8051 Development board having Reset&Input/outputsectionsconsistingof89C51Microcontroller,ElectrolyticCapacitor,Resistor,Jumpet,CrystalOscillator,Capacitors
14. Fabricate a single-sided PCB, mount the components and assemble them in acabinet for any one of the

circuits mentioned in the above exercises.

References:

1. Jon Varteresian, Fabricating Printed Circuit Boards, Newnes, 2002
2. R. Tummala, Fundamentals of Microsystems Packaging, McGraw-Hill 2001
3. C. Robertson. PCB Designer´s Reference. Prentice Hall, 2003
4. Open-source EDA Tool KiCad Tutorial: http://kicad-pcb.org/help/tutorials/ 13. PCB Fabrication user guide page:
   http://www.wikihow.com/Create-Printed-Circuit-Boards
   http://www.siongboon.com/projects/2005-09-07_home_pcb_fabrication/
   http://reprap.org/wiki/MakePCBInstructions#Making_PCBs_yourself
   PCB Fabrication at home(video): https://www.youtube.com/watch?v=mv7Y0A9YeUc, https://www.youtube.com/watch?v=imQTCW1yWkg

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JNTUA - B.Tech. - R23 Regulations - Draft Course Structure and II year syllabus - - Regarding

Inbox ×

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dap Jntua <dap@jntua.ac.in> May 4, 2024, 5:04 PM
to Siddharth, principal.70, Chadalawada, Sri, G.Pulla, Rajeev, SISTK_4E_Principal, principal.GO, principal.AT, principal.75, N.E

Dear Sir/Madam,

By directions, I am sharing the **draft course structure of II, III & IV year and II year syllabus** disciplines (R23 regulations) offered by the University and are applicable for the students admitted from 2023-24 onwards.

The curriculum has been prepared by the respective boards of studies of the three technological Uni JNTUK & JNTUGV, of the State.

Disciplines (B.Tech.)

1. Civil Engineering
2. EEE
3. Mechanical Engineering
4. ECE
5. CSE
6. CSD
7. AI & ML
8. AI & DS
9. CSE (AI)
10. CSE (AI&ML)
11. CSE (Cyber Security)
12. CSE (Data Science)

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B.TECH. – ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech. II Year-I Semester

S.No.	Category	Title	L	T	P	C
1	BS	Complex Variables & Numerical Methods	3	0	0	3
2	HSMC	Universal Human Values-Understanding Harmony	2	1	0	3
3	Engineering Science	Electromagnetic Field Theory	3	0	0	3
4	Professional Core	Electrical Circuit Analysis-II	3	0	0	3
5	Professional Core	DC Machines & Transformers	3	0	0	3
6	Professional Core	Electrical Circuit Analysis-II and Simulation Lab	0	0	3	1.5
7	Professional Core	DC Machines & Transformers Lab	0	0	3	1.5
8	Skill Enhancement Course	Data Structures	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
		Total	**15**	**2**	**10**	**20**

B.Tech. II Year-II Semester

S.No.	Category	Title	L	T	P	C
1	Management Elective- I	Managerial Economics & Financial Analysis / Business Environment / Organizational Behaviour	2	0	0	2
2	Engineering Science/Basic Science	Analog Circuits	3	0	0	3
3	Professional Core	Power Systems-I	3	0	0	3
4	Professional Core	Induction and Synchronous Machines	3	0	0	3
5	Professional Core	Control Systems	3	0	0	3
6	Professional Core	Induction and Synchronous Machines Lab	0	0	3	1.5
7	Professional Core	Control Systems Lab	0	0	3	1.5
8	Skill Enhancement course	Python Programming	0	1	2	2
9	Engineering Science	Design Thinking & Innovation	1	0	2	2
		Total	**15**	**1**	**10**	**21**
Mandatory Community Service Project of 08 weeks duration during summer vacation						

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UNIT III: Modeling with Partial Differential Equations:
Linear Temperature Diffusion; One-dimensional Hydrodynamic model. Case Studies: Heat diffusion, Wave vibration, Laplace Equation.

UNIT IV Modeling Discrete Systems:
Modeling with difference equations; Modeling with data; Discrete Velocity Models; Continuous Vs. Discrete Models

UNIT V Simulation:
Block-Diagrams; State-Space Model; Transfer Functions, State-space Vs. transfer function. Stability and pole locations; Introduction to Matlab\Simulink (Starting Simulink, Basic Elements, Building a System, Running Simulations); Simulation of some models (case study models) and Analysis of Simulation results.

Textbook

1. Kai Veltn, Mathematical Modeling and Simulation: Introduction for Scientists and Engineers, Wiley 2009. (Main Reference 1)
2. Steven T. Karris, Introduction to Simulink® with Engineering Applications, Orchard Publications, 2006. (Main Reference 2)

References:

1. Averill Law, Simulation Modeling and Analysis with Expertfit Software, McGraw-Hill Science, 2007.
2. M. M. Gibbons, A Concrete Approach to Mathematical Modelling, Wiley-Interscience, 2007. Topics in Industrial Mathematics; H. Neunzert, A. Siddiqui; Kluwer Academic Publishers, 2000.
3. D. Basmadjian, Mathematical Modeling Physical systems: An Introduction; Oxford University Press, 2003.

PYTHON PROGRAMMING

Course Objectives:
The main objectives of the course are to

- Introduce core programming concepts of Python programming language.
- Demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries
- Implement Functions, Modules and Regular Expressions in Python Programming and to create practical and contemporary applications using these

Course Outcomes: After completion of the course, students will be able to

- Showcase adept command of Python syntax, deftly utilizing variables, data types, control structures, functions, modules, and exception handling to engineer robust and efficient code solutions. (L4)
- Apply Python programming concepts to solve a variety of computational problems (L3)
- Understand the principles of object-oriented programming (OOP) in Python, including classes, objects, inheritance, polymorphism, and encapsulation, and apply them to design and implement Python programs (L3)
- Proficient in using commonly used Python libraries and frameworks such as JSON,

XML, NumPy, pandas (L2)

- Exhibit competence in implementing and manipulating fundamental data structures such as lists, tuples, sets, dictionaries (L3)

UNTI-I:

History of Python Programming Language, Thrust Areas of Python, Installing Anaconda Python Distribution, Installing and Using Jupyter Notebook.

Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, the type () Function and Is Operator, Dynamic and Strongly Typed Language.

Control Flow Statements: if statement, if-else statement, if...elif…else, Nested if statement, while Loop, for Loop, continue and break Statements, Catching Exceptions Using try and except Statement.

Sample Experiments:

1. Write a program to find the largest element among three Numbers.
2. Write a Program to display all prime numbers within an interval
3. Write a program to swap two numbers without using a temporary variable.
4. Demonstrate the following Operators in Python with suitable examples.

i) Arithmetic Operators ii) Relational Operators iii) Assignment Operators iv) Logical Operators v) Bit wise Operators vi) Ternary Operator vii) Membership Operators viii) Identity Operators

5. Write a program to add and multiply complex numbers
6. Write a program to print multiplication table of a given number.

UNIT-II:

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the function, return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.

Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, del Statement.

Sample Experiments:

7. Write a program to define a function with multiple return values.
8. Write a program to define a function using default arguments.
9. Write a program to find the length of the string without using any library functions.
10. Write a program to check if the substring is present in a given string or not.
11. Write a program to perform the given operations on a list:
    i. additionii. insertioniii. slicing
12. Write a program to perform any 5 built-in functions by taking any list.

UNIT-III:

Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, del Statement.

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B.TECH. – ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech. III Year-I Semester

S.No.	Category	Title	L	T	P	C
1	Professional Core	Power Electronics	3	0	0	3
2	Professional Core	Digital Circuits	3	0	0	3
3	Professional Core	Power Systems-II	3	0	0	3
4	Professional Elective- I	1. Signals and Systems 2. Computer Architecture and Organization 3. Communication systems	3	0	0	3
5	Open Elective-I		3	0	0	3
6	Professional Core	Power Electronics Lab	0	0	3	1.5
7	Professional Core	Analog and Digital Circuits Lab	0	0	3	1.5
8	Skill Enhancement course	Soft Skills	0	1	2	2
9	Engineering Science	Tinkering Lab	0	0	2	1
10	Evaluation of Community Service Internship	-	-	-	-	2
		Total	**15**	**1**	**10**	**23**

B.Tech. III Year-II Semester

S.No.	Category	Title	L	T	P	C
1	Professional Core	Electrical Measurements and Instrumentation	3	0	0	3
2	Professional Core	Microprocessors and Microcontrollers	3	0	0	3
3	Professional Core	Power System Analysis	3	0	0	3
4	Professional Elective-II	1. Switchgear and Protection 2. Advanced Control Systems 3. Renewable and Distributed Energy Technologies	3	0	0	3
5	Professional Elective-III	1. Electric Drives 2. Digital Signal Processing 3. High Voltage Engineering	3	0	0	3
6	Open Elective - II		3	0	0	3
7	Professional Core	Electrical Measurements and Instrumentation Lab	0	0	3	1.5
8	Professional Core	Microprocessors and Microcontrollers Lab	0	0	3	1.5
9	Skill Enhancement course	IoT Applications of Electrical Engineering	0	1	2	2
10	Audit Course	Technical paer Writing & IPR	2	0	0	-

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B.TECH. – ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech. – II Year I Semester

S.No.	Category	Title	L	T	P	Credits
1	BS	Probability and Complex Variables	3	0	0	3
2	HSMC	Universal Human Values – Understanding Harmony and Ethical Human Conduct	2	1	0	3
3	ES	Signals, Systems and Stochastic Processes	3	0	0	3
4	PCC	Electronic Devices and Circuits	3	0	0	3
5	PCC	Digital Circuits Design	3	0	0	3
6	PCC	Electronic Devices and Circuits Lab	0	0	3	1.5
7	PCC	Digital Circuits & Signal Simulation Lab	0	0	3	1.5
8	SEC	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			16	02	08	20

B.Tech. II Year II Semester

S.No.	Category	Title	L	T	P	Credits
1	HSMC	Managerial Economics and Financial Analysis / Organizational Behavior / Business Environment	2	0	0	2
2	ES	Linear Control Systems	3	0	0	3
3	PCC	EM Waves and Transmission Lines	3	0	0	3
4	PCC	Electronic Circuits Analysis	3	0	0	3
5	PCC	Analog and Digital Communications	3	0	0	3
6	PCC	Electronic Circuits Analysis Lab	0	0	3	1.5
7	PCC	Analog and Digital Communications Lab	0	0	3	1.5
8	SEC	Soft Skills	0	1	2	2
9	ES	Design Thinking and Innovation	1	0	2	2
Total			15	1	10	21
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation						

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B.TECH. – ELECTRONICS AND COMMUNICATION ENGINEERING

B.Tech. – III Year I Semester

S.No.	Category	Title	L	T	P	Credits
1	PCC	Analog and Digital IC Applications	3	0	0	3
2	PCC	Antennas and Wave Propagation	3	0	0	3
3	PCC	Microprocessors and Microcontrollers	3	0	0	3
4	PE - I	Computer Architecture & Organization Information Theory and Coding Detection and Estimation Theory Artificial Intelligence	3	0	0	3
5	OE- I		3	0	0	3
6	PCC	Analog & Digital IC Applications Lab	0	0	3	1.5
7	PCC	Microprocessors and Microcontrollers Lab	0	0	3	1.5
8	SEC	PCB Design and Prototype Development	0	1	2	2
9	ES	Tinkering Lab	0	0	2	1
10	Evaluation of Summer Internship		-	-	-	2
Total			15	1	10	23

B.Tech. III Year II Semester

S.No.	Category	Title	L	T	P	Credits
1	PCC	Digital Signal Processing	3	0	0	3
2	PCC	Microwave and Optical Communications	3	0	0	3
3	PCC	VLSI Design	3	0	0	3
4	PE – II	Electronic Measurements and Instrumentation Cellular and Mobile Communications/ Data Communications and Networking /Cellular & Mobile Communications Machine Learning Introduction to Robotics	3	0	0	3
5	PE-III	Embedded Systems Satellite Communications Optimization Techniques Cyber Security	3	0	0	3
6	OE - II		3	0	0	3
7	PCC	Microwave and Optical Communications Lab	0	0	3	1.5
8	PCC	VLSI Design Lab	0	0	3	1.5
9	SEC	AI and Signal Processing	0	1	2	2

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B.TECH. - COMPUTER SCIENCE & ENGINEERING

B.Tech.– II Year I Semester

S.No.	Category	Title	L	T	P	Credits
1	Basic Sciences	Discrete Mathematics & Graph Theory	3	0	0	3
2	HSMC	Universal Human Values– Understanding Harmony & Human Ethical Conduct	2	1	0	3
3	Engineering Science	Digital Logic & Computer Organization	3	0	0	3
4	Professional Core	Advanced Data Structures & Algorithm Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithm Analysis Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement Course	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

B.Tech.– II Year II Semester

S.No.	Category	Title	L	T	P	Credits
1	Management Elective-I	Managerial Economics and Financial Analysis / Business Environment / Organizational Behavior	2	0	0	2
2	Basic Science	Probability & Statistics	3	0	0	3
3	Professional Core	Operating Systems	3	0	0	3
4	Professional Core	Database Management Systems	3	0	0	3
5	Professional Core	Software Engineering	2	1	0	3
6	Professional Core	Operating Systems Lab	0	0	3	1.5
7	Professional Core	Database Management Systems Lab	0	0	3	1.5
8	Skill Enhancement Course	Full Stack Development –I	0	1	2	2
9	BS&H	Design Thinking & Innovation	1	0	2	2
Total			**14**	**2**	**10**	**21**
Mandatory Community Service Project Internship of 08 weeks duration during summer vacation						

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B.TECH. - COMPUTER SCIENCE & ENGINEERING

II Year II Semester	Full Stack Development – 1 (Skill Enhancement Course)	L	T	P	C
		0	1	2	2

Course Objectives:

The main objectives of the course are to

- Make use of HTML elements and their attributes for designing static web pages
- Build a web page by applying appropriate CSS styles to HTML elements
- Experiment with JavaScript to develop dynamic web pages and validate forms

Course Outcomes:

1. Design Websites. (L6)
2. Apply Styling to web pages. (L3)
3. Make Web pages interactive. (L3)
4. Design Forms for applications. (L6)
5. Choose Control Structure based on the logic to be implemented. (L4)

Experiments covering the Topics:

- Lists, Links and Images
- HTML Tables, Forms and Frames
- HTML 5 and Cascading Style Sheets, Types of CSS
- Selector forms
- CSS with Color, Background, Font, Text and CSS Box Model
- Applying JavaScript - internal and external, I/O, Type Conversion
- JavaScript Conditional Statements and Loops, Pre-defined and User-defined Objects
- JavaScript Functions and Events

Sample Experiments:

1. Lists, Links and Images

a. Write a HTML program, to explain the working of lists.
Note: It should have an ordered list, unordered list, nested lists and ordered list in an unordered list and definition lists.

b. Write a HTML program, to explain the working of hyperlinks using <a> tag and href, target Attributes.

c. Create a HTML document that has your image and your friend's image with a specific height and width. Also when clicked on the images it should navigate to their respective profiles.

d. Write a HTML program, in such a way that, rather than placing large images on a page, the preferred technique is to use thumbnails by setting the height and width parameters to something like to 100*100 pixels. Each thumbnail image is also a link to a full sized version of the image. Create an image gallery using this technique

2. HTML Tables, Forms and Frames

a. Write a HTML program, to explain the working of tables. (use tags: <table>, <tr>, <th>, <td> and attributes: border, rowspan, colspan)

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B.TECH. - COMPUTER SCIENCE & ENGINEERING

B.Tech. – III Year I Semester

S.No.	Category	Title	L	T	P	Credits
1	Professional Core	Machine Learning	3	0	0	3
2	Professional Core	Computer Networks	3	0	0	3
3	Professional Core	Formal Languages and Automata Theory	3	0	0	3
4	Professional Elective-I	1. Object Oriented Analysis and Design 2. Artificial Intelligence 3. Microprocessors & Microcontrollers 4. Data Warehousing & Data Mining 5. 12 week MOOC Swayam/NPTEL course recommended by the BoS	3	0	0	3
5	Open Elective-I		3	0	0	3
6	Professional Core	Machine Learning Lab	0	0	3	1.5
7	Professional Core	Computer Networks Lab	0	0	3	1.5
8	Skill Enhancement course	Full Stack Development - II	0	1	2	2
9	Engineering Science	Tinkering Lab	0	0	2	1
10	Evaluation of Community Service Internship		-	-	-	2
Total			15	1	10	23

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B.Tech. – III Year II Semester

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B.TECH. – ARTIFICIAL INTELLIGENCE & DATA SCIENCE

B.Tech.– II Year I Semester

S.No.	Category	Title	L	T	P	Credits
1	Basic Science	Discrete Mathematics & Graph Theory	3	0	0	3
2	HSMC	Universal Human Values - Understanding Harmony & Ethical Human Conduct	2	1	0	3
3	Engineering Science	Database Management Systems	3	0	0	3
4	Professional Core	Advanced Data Structures Algorithms Analysis	3	0	0	3
5	Professional Core	Object Oriented Programming Through Java	3	0	0	3
6	Professional Core	Advanced Data Structures and Algorithms Analysis Lab	0	0	3	1.5
7	Professional Core	Object Oriented Programming Through Java Lab	0	0	3	1.5
8	Skill Enhancement course	Python Programming	0	1	2	2
9	Audit Course	Environmental Science	2	0	0	-
Total			**16**	**2**	**8**	**20**

B.Tech.– II Year II Semester

S.No.	Category	Title	L	T	P	Credits
1	Management Course- I	Managerial Economics & Financial Analysis / Business Environment / Organizational Behavior	2	0	0	2
2	Engineering Science / Basic Science	Statistical Methods for Data Science	3	0	0	3
3	Professional Core	Principles of Artificial Intelligence	3	0	0	3
4	Professional Core	Introduction to Data Science	3	0	0	3
5	Professional Core	Digital Logic& Computer Organization	3	0	0	3
6	Professional Core	Artificial Intelligence Lab	0	0	3	1.5
7	Professional Core	Data Science using Python Lab	0	0	3	1.5
8	Skill Enhancement Course	Full Stack Development-1	0	1	2	2

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B.TECH. – ARTIFICIAL INTELLIGENCE & DATA SCIENCE

9	Engineering Science	Design Thinking & Innovation	1	0	2	2
Total			**15**	**1**	**10**	**21**
Mandatory Community Service Project Internship of 08weeks duration during summer vacation						

B.Tech. – III Year I Semester

S.No.	Category	Title	L	T	P	Credits
1	Professional Core	Data Warehousing and Data Mining	3	0	0	3
2	Professional Core	Natural Language Processing	3	0	0	3
3	Professional Core	Data Visualization	3	0	0	3
4	Professional Elective-I	OOAD Soft computing IoT Exploratory Data Analysis with Python	3	0	0	3
5	Open Elective- I		3	0	0	3
6	Professional Core	Data Warehousing and Data Mining Lab	0	0	3	1.5
7	Professional Core	Natural Language Processing Lab	0	0	3	1.5
8	Skill Enhancement course	Full Stack Development-2	0	1	2	2
9	ES	Tinkering Lab	0	0	2	1
10	Evaluation of Community Service Internship		-	-	-	2
Total			15	1	10	23

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R23 REGULATIONS

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B.TECH. – ARTIFICIAL INTELLIGENCE & DATA SCIENCE

B.Tech.– III Year II Semester

S.No.	Category	Title	L	T	P	Credits
1	Professional Core	Big Data Analytics	3	0	0	3
2	Professional Core	Deep Learning	3	0	0	3
3	Professional Core	Machine Learning	3	0	0	3
4	Professional Elective-II	Software Testing Methodology Cryptography & Network Security Operating Systems Recommender Systems Predictive Analytics Automata Theory & Compiler Design	3	0	0	3
5	Professional Elective-III	Software Project Management Quantum Computing Computer Vision Cloud Computing Social Network Analysis	3	0	0	3
6	Open Elective – II		3	0	0	3
7	Professional Core	Deep Learning Lab	0	0	3	1.5
8	Professional Core	Big data Analytics and Data Visualization Lab	0	0	3	1.5
9	Skill Enhancement course	Soft skills OR IELTS	0	1	2	2
10	Audit Course	Technical Paper Writing & IPR	2	0	0	-
		Total	**19**	**1**	**06**	**23**
Mandatory Industry Internship of 08 weeks duration during summer vacation						

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B.TECH. – ARTIFICIAL INTELLIGENCE & DATA SCIENCE

II Year II Semester	Full Stack Development – 1 (Skill Enhancement Course)	L	T	P	C
		0	1	2	2

Course Objectives:

The main objectives of the course are to

5. Make use of HTML elements and their attributes for designing static web pages
6. Build a web page by applying appropriate CSS styles to HTML elements
7. Experiment with JavaScript to develop dynamic web pages and validate forms

Experiments covering the Topics:

- Lists, Links and Images
- HTML Tables, Forms and Frames
- HTML 5 and Cascading Style Sheets, Types of CSS
- Selector forms
- CSS with Color, Background, Font, Text and CSS Box Model
- Applying JavaScript - internal and external, I/O, Type Conversion
- JavaScript Conditional Statements and Loops, Pre-defined and User-defined Objects
- JavaScript Functions and Events
- Node.js

Sample Experiments:

1. Lists, Links and Images

a. Write a HTML program, to explain the working of lists.
Note: It should have an ordered list, unordered list, nested lists and ordered list in an unordered list and definition lists.

b. Write a HTML program, to explain the working of hyperlinks using <a> tag and href, target Attributes.

c. Create a HTML document that has your image and your friend's image with a specific height and width. Also when clicked on the images it should navigate to their respective profiles.

d. Write a HTML program, in such a way that, rather than placing large images on a page, the preferred technique is to use thumbnails by setting the height and width parameters to something like to 100*100 pixels. Each thumbnail image is also a link to a full sized version of the image. Create an image gallery using this technique

2. HTML Tables, Forms and Frames

- Write a HTML program, to explain the working of tables. (use tags: <table>, <tr>, <th>, <td> and attributes: border, rowspan, colspan)

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- Write a HTML program, to explain the working of tables by preparing a timetable. (Note: Use <caption> tag to set the caption to the table & also use cell spacing, cell padding, border, rowspan, colspan etc.).
- Write a HTML program, to explain the working of forms by designing Registration form. (Note: Include text field, password field, number field, date of birth field, checkboxes, radio buttons, list boxes using <select>&<option> tags, <text area> and two buttons ie: submit and reset. Use tables to provide a better view).
- Write a HTML program, to explain the working of frames, such that page is to be divided into 3 parts on either direction. (Note: first frame image, second frame paragraph, third frame hyperlink. And also make sure of using "no frame" attribute such that frames to be fixed).

3. HTML 5 and Cascading Style Sheets, Types of CSS

a. Write a HTML program, that makes use of <article>, <aside>, <figure>, <figcaption>, <footer>, <header>, <main>, <nav>, <section>, , tags.
b. Write a HTML program, to embed audio and video into HTML web page.
c. Write a program to apply different types (or levels of styles or style specification formats) - inline, internal, external styles to HTML elements. (identify selector, property and value).

4. Selector forms

a. Write a program to apply different types of selector forms
   - Simple selector (element, id, class, group, universal)
   - Combinator selector (descendant, child, adjacent sibling, general sibling)
   - Pseudo-class selector
   - Pseudo-element selector
   - Attribute selector

5. CSS with Color, Background, Font, Text and CSS Box Model

a. Write a program to demonstrate the various ways you can reference a color in CSS.
b. Write a CSS rule that places a background image halfway down the page, tilting it horizontally. The image should remain in place when the user scrolls up or down.
c. Write a program using the following terms related to CSS font and text:
   i. font-size ii. font-weight iii. font-style
   iv. text-decoration v. text-transformation vi. text-alignment
d. Write a program, to explain the importance of CSS Box model using
   i. Content ii. Border iii. Margin iv. padding

6. Applying JavaScript - internal and external, I/O, Type Conversion

a. Write a program to embed internal and external JavaScript in a web page.
b. Write a program to explain the different ways for displaying output.
c. Write a program to explain the different ways for taking input.
d. Create a webpage which uses prompt dialogue box to ask a voter for his name and age. Display the information in table format along with either the voter can vote or not

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7. JavaScript Pre-defined and User-defined Objects

a. Write a program using document object properties and methods.
b. Write a program using window object properties and methods.
c. Write a program using array object properties and methods.
d. Write a program using math object properties and methods.
e. Write a program using string object properties and methods.
f. Write a program using regex object properties and methods.
g. Write a program using date object properties and methods.
h. Write a program to explain user-defined object by using properties, methods, accessors, constructors and display.

8. JavaScript Conditional Statements and Loops

a. Write a program which asks the user to enter three integers, obtains the numbers from the user and outputs HTML text that displays the larger number followed by the words "LARGER NUMBER" in an information message dialog. If the numbers are equal, output HTML text as "EQUAL NUMBERS".
b. Write a program to display week days using switch case.
c. Write a program to print 1 to 10 numbers using for, while and do-while loops.
d. Write aprogram to print data in object using for-in, for-each and for-of loops
e. Develop a program to determine whether a given number is an 'ARMSTRONG NUMBER' or not. [Eg: 153 is an Armstrong number, since sum of the cube of the digits is equal to the number i.e.,13 + 53+ 33 = 153]
f. Write a program to display the denomination of the amount deposited in the bank in terms of 100's, 50's, 20's, 10's, 5's, 2's & 1's. (Eg: If deposited amount is Rs.163, the output should be 1-100's, 1-50's, 1- 10's, 1-2's & 1-1's)

9. Javascript Functions and Events

a. Design a appropriate function should be called to display
   - Factorial of that number
   - Fibonacci series up to that number
   - Prime numbers up to that number
   - Is it palindrome or not

b. Design a HTML having a text box and four buttons named Factorial, Fibonacci, Prime, and Palindrome. When a button is pressed an appropriate function should be called to display
   11. Factorial of that number
   12. Fibonacci series up to that number
   13. Prime numbers up to that number
   14. Is it palindrome or not

c. Write a program to validate the following fields in a registration page
   i. Name (start with alphabet and followed by alphanumeric and the length should not be less than 6 characters)
   ii. Mobile (only numbers and length 10 digits)
   iii. E-mail (should contain format like xxxxxxx@xxxxxx.xxx)

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Text Books:

1. Programming the World Wide Web, 7th Edition, Robet W Sebesta, Pearson, 2013.
2. Web Programming with HTML5, CSS and JavaScript, John Dean, Jones & Bartlett Learning, 2019 (Chapters 1-11).
3. Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, Vasan Subramanian, 2nd edition, APress, O'Reilly.

Web Links:

1. https://www.w3schools.com/html
2. https://www.w3schools.com/css
3. https://www.w3schools.com/js/
4. https://www.w3schools.com/nodejs
5. https://www.w3schools.com/typescript

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